THE CITY COUNCIL OF WATERLOO, IOWA
REGULAR SESSION TO BE HELD AT
Harold E. Getty Council Chambers
Tuesday, September 8, 2026
5:30 PM

CITY OF WATERLOO
COMMUNITY VISION PLAN

1. Fly the W: To develop a sense of pride and relationship between residents and the City of Waterloo, and then leverage that pride to communicate the City's attributes to external audiences.
2. Elevate Housing: Redevelop, renovate, or improve 800 residences in Waterloo in eight years by providing access to capital.
3. Celebrate and Connect Neighborhoods: To leverage Waterloo's rich tradition of neighborhoods by celebrating and connecting them with the community and region at large.
4. Waterloo Works: Grow a diverse and skilled workforce in Waterloo that connects people and employers for mutual growth.
5. Crossroads Doubledown: Re-energize the Crossroads Mall area into a sports/recreation-themed gravitational center.
6. Power Up Downtown: Keep Waterloo's core downtown evolving to meet the needs of future generations, supporting and showcasing arts and cultural opportunities and creating an experience like no other.
7. Sportstown USA: To generate excitement, develop youth, and drive investment and economic impact from year-round visitors.
8. Community of Opportunity: Eliminate barriers that keep Waterloo residents, and the community as a whole, from reaching its true potential, creating an equitable, thriving, and sustainable community for future generations. Waterloo is a Community of Opportunity, where everyone can prosper.

GENERAL RULES FOR PUBLIC PARTICIPATION REGULAR SESSION AGENDA

A. Iowa Code Chapter 21 gives the public the right to attend council meetings, but it does not require cities to allow public participation except during public hearings. The public is required to follow the rules listed in this article when speaking during any meeting of the city council.
B. At the presiding officer's discretion, individuals may address the presiding officer by stepping to the podium, and after recognition by the presiding officer, shall state their

name, address, and group affiliation, if appropriate, and speak clearly into the microphone.

C. Comments shall be germane and refrain from personal, impertinent, or slanderous remarks.
D. Cell phones and electronic devices shall be set to silent prior to the start of the meeting.

RULES FOR PUBLIC COMMENT SECTION OF THE AGENDA

A. Individuals shall speak one (1) time on only one (1) issue for a maximum of three (3) minutes During the public comment section of the agenda. The public shall not be required to pre-register to speak during public comment. Individuals shall only speak on matters not listed on the regular agenda for that date. Any matter presented shall be directed to the presiding officer and addressed, if necessary, after the meeting.
B. Council members may speak during public comment portion of the agenda after the public has finished speaking
C. City staff shall not be required to provide an immediate answer to a matter presented during a council meeting unless it specifically pertains to an item on the agenda

RULES FOR PUBLIC COMMENT DURING PUBLIC HEARINGS

Individuals may speak during the public comment portion of a scheduled public hearing for a maximum of three (3) minutes or may submit written comments to the city clerk by four o'clock (4:00) P.M. on the day of the public hearing. Groups of citizens with similar viewpoints are encouraged to select a representative to share the viewpoint of the group.

RULES FOR PUBLIC COMMENT DURING AGENDA ITEMS

At the discretion of the presiding officer, individuals may speak for a maximum of three (3) minutes when the council discusses agenda items. This section does not apply to businesses or parties directly involved in agenda items.

Roll Call.

Prayer or Moment of Silence.

Pledge of Allegiance, Hector Salamanca Arroyo, Ward 5 Council Member.

Approval of Agenda as proposed or amended.

Approval of Minutes of the August 17, 2026 Council Regular Session, as proposed or amended.

CONSENT AGENDA

The consent agenda is reserved for routine resolutions and motions, acted upon by roll call vote on a single motion without discussion. Council shall either vote yea or nay when the roll is called. Council members may request that an item be removed from the consent agenda and considered separately. Such a request does not require a second. The public shall be prohibited from requesting that items listed on the consent agenda be removed and considered separately. The public may contact council members with questions regarding consent agenda

items. 1-4A-16(A)(8).

1. Bills Payment, Finance Committee Invoice Summary Report, a copy of which is on file in the office of the City Clerk.

2. Resolution setting date of public hearing as October 5, 2026, for the authorization of a loan and disbursement agreement and the issuance of not to exceed $3,968,000.00 Sewer Revenue Capital Loan Notes of the City of Waterloo, Iowa, and instructing the City Clerk to publish notice.

3. Resolution setting date of public hearing as September 21, 2026, to approve a request by Yashpal Saini to rezone approximately 5.29 acres from “A-1” Agricultural District to “R-2” One and Two Family Residence District in order to split the lots to allow for the construction of single-family homes located south of 1220 Bishop Avenue to 1304 Bishop Avenue, and instruct the City Clerk to publish notice.

4. Resolution approving preliminary plans, specifications, form of contract, etc., setting date of bid opening as October 8, 2026, and date of public hearing as October 19, 2026, for the renovation of 100 E. 4th Street, for Waterloo City Hall and Police Department, and instruct the City Clerk to publish notice.

5. Motion approving Change Order No. 1 with GEMS Technical Services, Inc., of Orange, California, to add thirty calendar days to contract completion due to manufacturer delays, with no change to the contract price, in conjunction with the Replace Passenger Boarding Bridge, FAA AIP Project No. 3-19-0094-057-2025, and authorizing the Mayor and City Clerk to execute said document.

6. Motion to approve the hiring of **Carson Jordan** from the current Civil Service List to the position of Operations Specialist at the Young Arena, effective September 9, 2026.

7. Motion to approve the hiring of **Derek White** from the current Civil Service List to the position of Chief Mechanical Inspector in Building Inspections, effective after September 8, 2026.

8. Motion approving the hiring of **Kate Winston** to the position of Human Resources Specialist in the Human Resources Department, effective September 9, 2026.

9. Motion to approve the hiring of **Craig Denner** from the current Civil Service List to the position of Assistant Young Arena Manager at the Young Arena, effective September 9, 2026.

10. **Carole Gustafson,** Board/Commission: Civil Service Commission, Expiration Date: September 8, 2032, New appointment.

11. **Mendoor L. Smith,** Board/Commission: Human Rights Commission, Expiration Date: September 8, 2029, New appointment.

12. **Lamie Kromah,** Board/Commission: Human Rights Commission, Expiration Date: September 8, 2029, New appointment.

13. **Jennifer Stevenson,** Board/Commission: Human Rights Commission, Expiration Date:

September 8, 2029, New appointment.

14. Communication from the City Clerk's Office on the notice of the conclusion of employment of Cindy Young, Clerk II, effective August 17, 2026, with recommendation of approval of payout of $11,114.25 for unused benefits.

15. Communication from the Leisure Services Department on the notice of the conclusion of employment of Chris Dolan, Young Arena Manager, effective August 14, 2026, with recommendation of approval of payout of $6,557.10 for unused benefits.

16. Communication from the Street Department on the notice of the conclusion of employment of Kathy Keys, Equipment Operator I, effective July 31, 2026, with recommendation of approval of payout of $3,594.06 for unused benefits.

17. Communication from the Police Department on the notice of the conclusion of employment of Taylor McNamara, Police Officer, effective August 12, 2026, with recommendation of approval of payout of $159.85 for unused benefits.

18. Motion to receive and file Airport Board minutes of July 27, 2026.

19. Motion to receive and file Board of Adjustment minutes for July 2026.

20. Motion to receive and file Historic Preservation Commission minutes of July 2026.

21. Motion to receive and file Leisure Services Commission Board minutes of July 14, 2026.

22. Motion to receive and file Planning, Programming, and Zoning Commission minutes of July 2026.

23. Motion to approve denying an application by Pryme Tyme, LLC, 626 Sycamore Street, for a Class C Retail Alcohol License.

24. **Liquor Licenses**
    Brendas Park Road Inn, 306 Park Road, Class C w/Sunday Sales (Renewal) Exp: 08/08/2027.
    Dub's Pub, 1106 La Porte Road, Class C w/Outdoor Service and Sunday Sales (Renewal) Exp: 09/12/2027.
    Casey's General Store #2867, 2424 Ranchero Road, Class E w/Sunday Sales (Renewal) Exp: 06/14/2027.
    Friends of Faith, 600 Park Lane, Class F, w/Sunday Sales (Ownership Update)
    Highway 63 Diner, 3030 Marnie Road, Class C w/Sunday Sales (Renewal) Exp: 07/29/2027.
    Landmark Commons, 1400 Maxhelen Road, Class E w/Sunday Sales (New) Exp: 08/31/2027.
    Longhorn Steakhouse, 1425 E. San Marnan Drive, Class C w/Sunday Sales (Renewal) Exp: 08/31/2027.
    Marshal BWS, 2060 Sovia Drive, Ste 112, Class E w/Sunday Sales (New) Exp: 06/30/2027.
    Rome's Place, 201 Rath Street, Class C w/Sunday Sales (Ownership Update) Exp: 09/17/2026.
    Senior Tequilla, 118 E. 11th Street, Class C w/Sunday Sales (Renewal) Exp: 05/18/2027.
    WCA Building & Amphitheater, 225 Commercial Street, Class C w/Outdoor Service and

Sunday Sales (Renewal) Exp: 06/22/2027.

25. Bonds.

PUBLIC HEARINGS

1. Asbestos Abatement Services, Contract AB-2026-08-06P.

Motion to receive and file proof of publication of notice of public hearing.
HOLD HEARING - No comments on file.
Motion to close hearing and receive and file oral and written comments.
Resolution confirming approval of plans, specifications, form of contract, etc., and authorizing to proceed.
Motion to receive, file, and instruct the City Clerk to read bids.
Resolution approving award of bid to All Star Environmental, LLC of Dubuque, Iowa, in the amount of $29,830.00, in conjunction with Asbestos Abatement Services, Contract AB-2026-08-06P, for properties located at 321 Dearborn Avenue, 521 Pine Street, 314 Reber Avenue, 1410 Mulberry Street, 420 Bayard Street, and 623 N. Barclay Street, and authorizing the Mayor and City Clerk to execute said document.

Submitted by: Noel Anderson, Community Planning and Development Director

2. FY 2027 Sidewalk Repair Assessment Program - Zone 5B, Contract No. 1156.

Motion to receive and file proof of publication of notice of public hearing.
HOLD HEARING - No comments on file.
Motion to close hearing and receive and file oral and written comments.
Resolution confirming approval of plans, specifications, form of contract, etc., and authorizing to proceed.
Motion to receive, file and instruct City Clerk to read bids and refer to the City Engineer for further review.

Submitted by: Jamie Knutson, City Engineer

3. FY 2027 Sergeant Road Trail Repairs, Contract No. 1091.

Motion to receive and file proof of publication of notice of public hearing.
HOLD HEARING - No comments on file.
Motion to close the hearing and receive and file oral and written comments.
Resolution confirming approval of specifications, bid documents, form of contract, etc., and authorizing to proceed.

Submitted by: Jamie Knutson, City Engineer

RESOLUTIONS

1. Resolution establishing a temporary moratorium on approvals relating to data centers.

   Submitted by: Dave Morrow, Ward 2 Council Member

2. Resolution approving the Amendment to Business Property Lease with Friends of Faith Retirement Homes, Inc. for the purpose of stormwater detention, pickle ball courts, and parking at Bontrager Park, and authorizing Mayor and City Clerk to execute said document.

Submitted by: Todd Derifield, Leisure Services Director

3. Resolution approving a Professional Service Agreement with Schumacher Elevator, Denver, Iowa, for the replacement of the Waterloo Public Library elevator in the amount of $274,344.00, rescinding Resolution No. 2025-641 in its entirety, and authorizing the Mayor and City Clerk to execute said document.

   Submitted by: Brian Baker, Interim Building Official

4. Resolution approving the sale of all contents of the former Courier Building, 100 E. 4th Street, Waterloo, Iowa, including desks, chairs, shelving, tables, etc. as requested by the Building Maintenance Department.

   Submitted by: Brian Baker, Interim Building Official

5. Resolution approving a Contract with Midwest Cleaning Pros of Waverly, Iowa, in the amount of $82,092.00 annually, in conjunction with the cleaning of the Public Works Facility, and authorizing the Public Works Division Manager to execute said document.

   Submitted by: Randy Bennett, Public Works Division Manager

6. Resolution approving a Temporary Easement Agreement in the amount of $2,269.00 with NNDYM WLK, Inc., located at 1945 La Porte Road, in conjunction with the La Porte Road Phase III Reconstruction Project, and authorizing the Mayor and City Clerk to execute said document.

   Submitted by: Noel Anderson, Community Planning and Development Director

7. Resolution approving a Development and Minimum Assessment Agreement with Kel Mar, LC, for the construction of a new 60,000 square-foot warehouse building with a tax rebate schedule of one year at seventy-five percent, one year at seventy percent, and eleven years at fifty percent, with a Minimum Assessment Agreement of $3,030,000.00, for property located south of 1575 W. Big Rock Road, and authorizing the Mayor and City Clerk to execute said documents.

   Submitted by: Noel Anderson, Community Planning and Development Director

8. Resolution in support of grant applications and continued development of a proposed three-year, two-zone Cedar Valley Micro-Transit Pilot Program at a total program cost not to exceed $4,600,000.00.

   Submitted by: Bridgett Wood, Finance Director

9. Resolution approving the contract for services with the Iowa Northland Regional Council of Governments of Waterloo, Iowa, in the amount of $5,500.00, in conjunction with the St. Mary's Development, and authorizing the Mayor and City Clerk to execute said document.

   Submitted by: Angie Fordyce, Community Development Coordinator

ORDINANCES

1. **An ordinance amending sewer user charges and fees relating to monthly winter consumption.**

Motion to receive, file, consider and pass for the first time an ordinance repealing Subsection 1 of Title 8, Public Utilities, Chapter 3, Sewer Regulations, Article A, User Charges and Fees, Section 2, Determination of Rates and Charges, and enacting in lieu thereof a new Subsection 1 of Title 8, Public Utilities, Chapter 3, Sewer Regulations, Article A, User Charges and Fees, Section 2, Determination of Rates and Charges.
Motion to suspend the rules.
Motion to consider and pass for the second and third times and adopt the ordinance.
Resolution rescinding Resolution No. 2009-1235 in its entirety.

Submitted by: Randy Bennett, Public Works Division Manager

ADMINISTRATIVE HEARING

Hearing and Order Assessing $1,500.00 civil penalty to Kwik Stop 3, 1104 Washington Street, Waterloo, Iowa, for sale of tobacco to minor, 2nd offense.

PUBLIC COMMENTS

Iowa Code Chapter 21 gives the public the right to attend council meetings but it does not require cities to allow public participation except during public hearings. The City of Waterloo encourages the public to participate during the Oral Presentations by following the rules listed on the front of the agenda.

CLOSED SESSION

1. Closed Session on the purchase of real estate pursuant to Iowa Code Section 21.5(1)(j).

ADJOURNMENT

Motion to adjourn.

Kelley Felchle
City Clerk

August 17, 2026

The City Council of the City of Waterloo, Iowa, met in Regular Session at Harold E. Getty Council Chambers, Waterloo, Iowa, at 5:30 PM, on Monday, August 17, 2026.

Pre-Meeting Items

Roll Call.

Mayor Dave Boesen in the chair. Mr. Schmitt, Mr. Morrow, Ms. Creighton-Smith (arrived at 5:33 p.m.), Ms. Berry, Mr. Salamanca, Mr. Martin and Mr. Simon.

Prayer or Moment of Silence.

Pledge of Allegiance, Hector Salamanca Arroyo, Ward 5 Council Member.

Approval of Agenda as proposed or amended.

Simon/Martin
that the agenda, as amended, be approved. Voice vote-Ayes: Six. Motion carried.

Approval of Minutes of the July 20, 2026, and August 3, 2026, Council Regular Session, and the August 6, 2026 Special Council Session, as proposed or amended.

Simon/Martin
that the minutes of the July 20, 2026, and August 3, 2026, Council Regular Session be approved as presented. Voice vote-Ayes: Six. Motion carried.

CONSENT AGENDA

Simon/Martin
that the following items on the consent agenda, with items 7, 10 and 14, being removed to be considered separately, be received and placed on file, including the payment of bills for August 10, 2026, in the amount of $4,743,415.14and August 17, 2026, in the amount of $1,539,559.78, be received and placed on file. Roll Call vote-Ayes: Six. Motion carried.

Bills Payment, Finance Committee Invoice Summary Report, a copy of which is on file in the office of the City Clerk.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-441.

Resolution approving the request by Robert and Susan Funk, for tax exemptions on the construction of a new twin home valued at $369,900.00, for property located at 4183 Mystic Drive and located in the City Limits Urban Revitalization Area (CLURA).

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-442.

Resolution approving the request by Arp Patel, for tax exemptions on the construction of a new single-family home valued at $100,000.00, for property located at 136 Janney Avenue and located in the Consolidated Urban Revitalization Area (CURA).

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-443.

Resolution approving the request of David Boswell for a waiver for a concrete driveway, located at 207 Southcrest Drive, and authorizing the construction of a concrete driveway and placing a driveway or sidewalk on the city right-of-way on an unimproved street.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-444.

Resolution approving preliminary plans, specifications, form of contract, etc., setting date of bid opening as August 27, 2026, and date of public hearing as September 8, 2026, in conjunction with Asbestos Abatement Services, Contract AB-2026-08-06P, and instruct the City Clerk to publish notice.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-445.

Resolution approving preliminary plans, specifications, form of contract, etc., setting date of bid opening as September 3, 2026, and date of public hearing as September 8, 2026, in conjunction with the FY 2027 Sidewalk Repair Assessment Program - Zone 5B, Contract No. 1156, and instruct the City Clerk to publish notice.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-446.

Resolution approving preliminary plans, specifications, form of contract, etc., setting date of bid opening as September 10, 2026, and date of public hearing as September 21, 2026, in conjunction with the FY 2026 South Business Park - Phase I, Contract No. 1129, RM-8155(789)--9D-07 and instruct the City Clerk to publish notice.

This item was removed to be considered separately.

Resolution setting date of public hearing as September 8, 2026, in conjunction with the FY 2027 Sergeant Road Trail Repairs, Contract No. 1091, and instruct the City Clerk to publish notice.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-447.

Resolution approving award of bid to MidState Solutions, LLC, of Baxter, Iowa, in the amount of $215,541.18, approving the contract, bond and certificate of insurance, in conjunction with the FY 2027 Sidewalk Infill, Sidewalk Ramp and Trail Repair Program - Zone 5B, Contract No. 1157, and authorizing the Mayor and City Clerk to execute said document.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-448.

Resolution approving Completion of Project and Recommendation of Acceptance of Work for work performed by I & S Group, Inc., of 314 E. 4th St, Waterloo, Iowa, in the amount of $23,700.00, in conjunction with the Five Sullivan Brothers Convention Center Addition, Project No. 21042.

This item was removed to be considered separately.

Resolution approving a cancellation of a sidewalk assessment for 275 Hammond Avenue, Certificate No. 35-0017977, in the amount of $254.63.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-449.

Resolution approving the sale of used vehicles and equipment from the Public Works Department via the Purple Wave website.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-450.

Resolution approving the installation of a speed hump in the 3900 block of Cedar Terrace.

Roll Call vote-Ayes: Six. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-451.

Motion to approve Change Order No. Cr-2026-0058 with Entrust Solutions Group, of Lisle, Illinois in the amount of $51,492.51, in conjunction with the Waterloo Fiber Backbone Project, and authorizing the Mayor to execute said document.

Motion to approve addendum, No. 12 with EN Communications of Lisle Illinois, in the amount of $2,896.00, in conjunction with Waterloo Fiver Backbone Project, and authorizing the Mayor to execute said document.

Matthew Carpenter, Board/Commission: Board of Adjustment, Expiration Date: August 17, 2031, New appointment.

Communication from the Library Department on the notice of the conclusion of employment of Nolan Rochford-Volk, Library Assistant, effective July 9, 2026, with recommendation of approval of payout of $2,308.00 for unused benefits.

Communication from the Planning and Zoning Department on the notice of the conclusion of employment of Adarsh Tummala, Planner I, effective July 17, 2026, with recommendation of approval of payout of $2,498.20 for unused benefits.

Motion to receive and file Airport Board minutes of June 22, 2026.

Motion to receive and file Planning, Programming, and Zoning Commission minutes of May 2026.

Motion to receive and file Complete Streets Advisory Committee minutes of April 2026.

Liquor Licenses
WCA Building & Amphitheater, 225 Commercial Street, Class C w/Outoor Service and Sunday Sales (Renewal) Exp: 06/22/2027.

Cigarette/Tobacco/Nicotine/Vapor Permits

Bonds.

Item #7.
Morrow/Schmitt
Resolution approving preliminary plans, specifications, form of contract, etc., setting date of big opening as September 3, 2026, and date of public hearing as September 21, 2026, in conjunction with the FY2026 South Business Park -Phase I, Contract No. 1129, RM-8155(789)--9D-07 and instruct the City Clerk to publish notice. Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-452.

Mr. Morrow questioned what is included in Phase I.

Wayne Castle, Assistant City Engineer, provided an overview of the item.

Item #10.
Morrow/Schmitt
Resolution approving Completion of Project and Recommendation of Acceptance of Work for work performed by I & S Group, Inc, of 314 E. 4th Street, Waterloo, Iowa, in the amount of $23,700.00, in conjunction with the Five Sullivan Brothers Convention Center Addition, Project No. 21042. Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-453.

Mr. Morrow questioned if the $23,700.00 was part of the original contract amount or if it included changes.

Aric Schroeder, City Planner, provided an overview of the item.

Item #14.

Morrow/Schmitt
Motion to approve Change Order No. Cr-2026-0058 with Entrust Solutions Group, of Lisle, Illinois, in the amount of $2,896.00, in conjunction with Waterloo Fiber Backbone Project, and authorizing the Mayor to execute said document. Roll Call vote-Ayes: Seven. Motion carried.

Mr. Morrow requested additional information on the changes to the project.

Randy Bennett, Public Works Division Manager, provided additional details of the change order.

Mr. Simon asked if this was connected with the contract we had with K & W on July 20, 2026.

Randy Bennett confirmed and provided background on how the contracts are connected.

PUBLIC HEARINGS

Request by the City of Waterloo to rezone approximately 4.86 acres from "R-3" Multiple Residence District to "R-2,R-P" Planned Residence District and "R-3,R-P" Planned Residence District for the development of seventeen lots, including the expansion of Birdee Cottage located at 310 Upland Drive.

Schmitt/Simon
to receive and file proof of publication of notice of public hearing. Voice vote-Ayes: Seven. Motion carried.

This being the time and place of the public hearing, the Mayor called for written and oral comments and there were none.

Schmitt/Simon
to close the hearing and receive and file recommendation of approval of the Planning, Programming and Zoning Commission. Voice vote-Ayes: Seven. Motion carried.

Schmitt/Simon
to receive, file, consider, and pass for the first time an ordinance amending Ordinance No. 5079, as amended, City of Waterloo Zoning Ordinance, by amending the Official Zoning Map referred to in Section 10-4-4, approving a request by the City of Waterloo to rezone approximately 4.86 acres from "R-3" Multiple Residence District to "R-2,R-P" Planned Residence District and "R-3,R-P" Planned Residence District for the Development of seventeen lots, including the expansion of Birdee Cottage located at 310 Upland Drive. Roll Call vote-Ayes: Seven. Motion carried.

Schmitt/Simon
to suspend the rules. Roll Call vote-Ayes: Seven. Motion carried.

Schmitt/Simon

to consider and pass for the second and third times and adopt the ordinance. Roll Call vote-Ayes: Seven. Motion carried. Ordinance adopted and upon approval by Mayor assigned No. 5843.

Request by the City of Waterloo to rezone approximately 10.67 acres from “C-1” Neighborhood Commercial District and “A-1” Agricultural District to “R-3,R-P” Planned Residence District for the development of fourteen lots for single-family homes and townhomes located along West 3rd Street and Norton Street west of Sergeant Road.

Morrow/Berry
to receive and file proof of publication of notice of public hearing. Voice vote-Ayes: Seven. Motion carried.

This being the time and place of the public hearing, the Mayor called for written and oral comments.

Forest Dillavou, 1725 Huntington Road, spoke in opposition to the zoning change.

Morrow/Schmitt
to close the hearing and receive and file oral comments and recommendation of approval of the Planning, Programming and Zoning Commission. Voice vote-Ayes: Seven. Motion carried.

Morrow/Schmitt
to receive, file, consider, and pass for the first time an ordinance amending Ordinance No. 5079, as amended, City of Waterloo Zoning Ordinance, by amending the Official Zoning Map referred to in Section 10-4-4, approving a request by the City of Waterloo to rezone approximately 10.67 acres from “C-1” Neighborhood Commercial District and “A-1” Agricultural District to “R-3,R-P” Planned Residence District for the development of fourteen lots for single-family homes and townhomes located along West 3rd Street and Norton Street west of Sergeant Road. Roll Call vote-Ayes: Seven. Motion carried.

Mr. Simon asked if there was flood mitigation that the city needed to address.

Wayne Castle, Assistant City Engineer, confirmed and provided background information on the levy and ponding of the low-lying areas.

Mr. Morrow questioned if any of the property would be left as greenspace.

Wayne Castle provided an overview of the site plan for the property and plans for greenspace.

Mr. Salamanca commented that part of this development will be in the floodway.

Wayne Castle commented that portions of the area will be in the floodway, but homes will not be built there.

Morrow/Schmitt

to suspend the rules. Roll Call vote-Ayes: Seven. Motion carried.

Morrow/Schmitt
to consider and pass for the second and third times and adopt the ordinance. Roll Call vote-Ayes: Seven. Motion carried. Ordinance adopted and upon approval by Mayor assigned No. 5844.

Request by the City of Waterloo to vacate approximately 1,988 square feet of city-owned right-of-way of W. 3rd Street at the intersection of W. 3rd Street and Norton Street.

Schmitt/Berry
to receive and file proof of publication of notice of public hearing. Voice vote-Ayes: Seven. Motion carried.

This being the time and place of the public hearing, the Mayor called for written and oral comments and there were none.

Schmitt/Berry
to close the hearing and receive and file recommendation of approval of the Planning, Programming and Zoning Commission. Voice vote-Ayes: Seven. Motion carried.

Schmitt/Berry
to receive, file and consider and pass for the first time an ordinance approving a request by the City of Waterloo to vacate approximately 1,988 square feet of city-owned right-of-way of W. 3rd Street at the intersection of W. 3rd Street and Norton Street. Roll Call vote-Ayes: Seven. Motion carried.

Schmitt/Berry
to suspend the rules. Roll Call vote-Ayes: Seven. Motion carried.

Schmitt/Berry
to consider and pass for the second and third times and adopt said ordinance. Roll Call vote-Ayes: Seven. Motion carried. Ordinance adopted and upon approval by Mayor assigned No. 5845.

Sale and conveyance of 315 E. 4th Street to Try Pie in the amount of $1.00.

Creighton-Smith/Martin
to receive and file proof of publication of notice of public hearing. Voice vote-Ayes: Seven. Motion carried.

This being the time and place of the public hearing, the Mayor called for written and oral comments.

Sarah Helleso, Executive Director, Try Pie Bakery, 233 Prospect Avenue, provided a history of

their student employment program through Try Pie and thanked the council members for their consideration.

Forest Dillavou, 1725 Huntington Road, questioned how many taxpayer dollars are going towards this project.

Mayor Boesen explained that the WDC is deeding this property to the City.

Malia, 2549 Manor Street, shared that she is a Try Pie alumni. She provided an overview of how the Try Pie program impacted her life.

Creighton-Smith/Morrow
to close the hearing and receive and file oral comments. Voice vote-Ayes: Seven. Motion carried.

Creighton-Smith/Morrow
Resolution authorizing the sale and conveyance of 315 E. 4th Street to Try Pie in the amount of $1.00, and authorizing the Mayor and City Clerk to execute said documents. Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-454.

Several council members spoke in support of the program.

Creighton-Smith/Morrow
Resolution approving a Development and Minimum Assessment Agreement in the amount of $565,000.00 for 315 E. 4th Street and 311 E. 4th Street, and authorizing the Mayor and City Clerk to execute said document. Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-455.

<u>Sale and conveyance of city-owned property located south of 3915 Valdez Drive to Raymond I. Harris and Clozelle R. Harris in the amount of $1,576.00.</u>

Simon/Creighton-Smith
to receive and file proof of publication of notice of public hearing. Voice vote-Ayes: Seven. Motion carried.

This being the time and place of the public hearing, the Mayor called for written and oral comments and there were none.

Simon/Creighton-Smith
to close hearing. Voice vote-Ayes: Seven. Motion carried.

Simon/Creighton-Smith
Resolution authorizing the sale and conveyance of city-owned property located south of 3915 Valdez Drive to Raymond I. Harris and Clozelle R. Harris in the amount of $1,576.00, and authorizing the Mayor and City Clerk to execute said documents. Roll Call vote-Ayes: Seven.

Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-456.

Sale and conveyance of approximately 966 square-feet of city-owned property, located north and south of 1130 Ansborough Avenue, to Pebble Hill, LLC, a Delaware limited liability company, in the amount of $7,728.80.

Salamanca/Martin
to receive and file proof of publication of notice of public hearing. Voice vote-Ayes: Seven. Motion carried.

This being the time and place of the public hearing, the Mayor called for written and oral comments and there were none.

Salamanca/Martin
to close hearing. Voice vote-Ayes: Seven. Motion carried.

Salamanca/Martin
Resolution authorizing the sale and conveyance of approximately 966 square-feet of city-owned property, located north and south of 1130 Ansborough Avenue, to Pebble Hill, LLC, a Delaware limited liability company, in the amount of $7,728.80, subject to the retention of an easement over, under, upon, and across the described tracts, and authorizing the Mayor and City Clerk to execute said documents. Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-457.

RESOLUTIONS

Resolution approving a Temporary Easement Agreement in the amount of $100.00 with Nicole L. Russell, located at 1431 Ingersoll Road, in conjunction with the Katoski Drive/Huntington Road Reconstruction Project, and authorizing the Mayor and City Clerk to execute said document.

Morrow/Schmitt
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-458.

Resolution to approve the request by David Knipp for an Encroachment Agreement to allow for decorative rocks in the right-of-way of Bertch Avenue and W. 7th Street in the “R-2” One and Two-Family Residence District at 902 Bertch Avenue, and authorizing the Mayor and City Clerk to execute said document.

Morrow/Schmitt
Roll Call vote-Ayes: Five. Nays: Two (Creighton-Smith, Berry). Motion carried. Resolution

adopted and upon approval by Mayor assigned No. 2026-459.

Mr. Salamanca commented that he has been approached about whether allowing this would set a precedent. He explained that it would not, because variances are reviewed individually, adding that this is an example of how people in our opportunity can advocate for themselves and engage with their council members.

Kelley Felchle, City Clerk, shared that she received from the Planning and Zoning Department, a letter from a resident speaking in opposition and that she will forward that to the council.

Aric Schroeder, City Planner, shared that the Engineering Department was recommending denial and the Planning and Zoning Commission did recommend denial based on that recommendation.

Mayor Boesen asked if part of that recommendation was based on the fact that there are utilities in the right-of-way.

Aric Schroeder confirmed and added there was concern about setting a precedent.

Ms. Creighton-Smith questioned if there were visibility issues or just aesthetic issues.

Aric Schroeder shared that the letter that was received was the first to raise the issue of visibility, and commented that the rocks are not very large, and he does not see how they would impact visibility.

Mr. Morrow shared that he had driven by the home and saw no visibility issues and that the rocks are about one-foot in height.

Ms. Berry questions if, prior to the rocks being placed, the homeowner had expressed concerns about traffic driving onto the right-of-way grass area.

Aric Schroeder confirmed.

Mr. Simon questioned if the size of the rocks would be a hindrance if the city needed to access underground utilities.

Aric Schroeder explained that it would speculative for him to comment since the majority of the utilities would belong to the various utility companies.

The council members and mayor continued to discuss the resolution.

<u>Resolution to approve the request by the City of Waterloo for the preliminary plat of Park View Manor, a seventeen-lot residential subdivision located at 310 Upland Drive.</u>

Morrow/Schmitt
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor

assigned No. 2026-460.

Resolution to approve the request by the City of Waterloo for the preliminary plat of Admore Addition, a fourteen-lot residential subdivision located along W. 3rd Street and Norton Street west of Sergeant Road.

Salamanca/Berry
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-461.

Resolution to approve support of an agreement to obtain funding through the Iowa Department of Transportation's Revitalize Iowa's Sound Economy (R.I.S.E.) Program for a new road construction project off of W. Big Rock Road, and authorizing the Mayor and City CLerk to execute said document.

Salamanca/Berry
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-462.

Resolution approving a Professional Services Agreement with McClure Engineering for the writing, preparation, and submittal to the Iowa DOT's RISE grant program, for the extension of road near 1575 W. Big Rock Road, in an amount not to exceed $18,000.00, and authorizing the Mayor and City Clerk to execute said document.

Salamana/Berry
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-463.

Resolution approving a Development and Minimum Assessment Agreement with Kel Mar, LC, for the construction of a new 60,000 square-foot warehouse building with a tax rebate schedule of one year at seventy-five percent, one year at seventy percent, and eleven years at fifty percent, with a minimum assessment agreement of $3,030,000.00, for property located south of 1575 W. Big Rock Road, and authorizing the Mayor and City Clerk to execute said documents.

Salamanca/Schmitt
To table the item for the next meeting. Roll Call vote-Ayes: Seven. Motion carried.

Resolution approving an amended Articles of Agreement with the Middle Cedar Watershed Authority, and authorizing the Mayor and City Clerk to execute said document.

Creighton-Smith/Berry
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-464.

Resolution approving an agreement with MidAmerican Energy Company, of Des Moines, Iowa, in the estimated amount of $2,818.31, for gas main extension in conjunction with the FY 2026 Parkview Manor and W. 3rd Street Detention Basin, Contract No. 1137, and authorizing the Mayor to execute said document.

Creighton-Smith/Berry
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-465.

Resolution approving proposed construction of sidewalk improvements, in conjunction with the FY 2027 Sidewalk Repair Assessment Program - Zone 5B.

Berry/Martin
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-466.

Resolution to fix the value of lots, in conjunction with the FY 2027 Sidewalk Repair Assessment Program - Zone 5B.

Berry/Martin
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-467.

Resolution to adopt proposed plat and schedule of assessments and estimate of costs, in conjunction with the FY 2027 Sidewalk Repair Assessment Program - Zone 5B.

Berry/Martin
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-468.

Resolution of necessity and setting date of public hearing as September 8, 2026, in conjunction with the FY 2027 Sidewalk Repair Assessment Program - Zone 5B.

Creighton-Smith/Salamana
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-469.

Resolution approving Supplemental Agreement No. 3, to a Professional Services Agreement with Stanley Consultants, Inc., of Des Moines, Iowa, originally executed March 11, 2019, in an amount not to exceed $69,245.00, in conjunction with the Delane Avenue Storm Water Detention Improvements Project, and authorizing the Mayor and City Clerk to execute said document.

Creighton-Smith/Salamanca
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-470.

Mr. Morrow requested an overview of the item.

Wayne Castle, Assistant City Engineer, provided an overview of the agreement.

Resolution approving a Professional Services Agreement with Mead & Hunt of Madison, Wisconsin, in the amount of $45,343.00, to conduct an Exploratory Governance Transition Study (Phase 1), and authorizing the Mayor to execute said document.

Creighton-Smith/Salamanca
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-471.

David Deeds, Airport Board Chair, shared that the purpose of the agreement is to do a study of the governance and oversight of the Waterloo Airport Board.

The council members discussed the study with David Deeds.

Resolution approving Amendment No. 1 with Strand Associates, Inc., of Madison, Wisconsin, in the amount of $302,000.00, in conjunction with the design, bidding and construction related services agreement, in conjunction with the Final Effluent Building Electrical Updates Project, and authorizing the Mayor and City Clerk to execute said document.

Schmitt/Creighton-Smith
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-472.

Mr. Morrow requested an overview of the item.

Randy Bennett, Public Works Division Manager, explained that a lightning strike created a power outage at the plant and took out its redundancy for electrical power. The issue was fixed, but it showed a vulnerability to the plant. The purpose of the agreement is to update older infrastructure and incorporate arch-flash as well.

Mayor Boesen questioned if one large generator will be looked at or if multiple generators will be explored.

Randy co

Resolution approving submission of an Intended Use Plan and Facility Plan to the Iowa

Department of Natural Resources for the US Highway 63 Lift Station, Force Main, and Sanitary Sewer Improvements Phase II Project, and authorizing the Mayor and City Clerk to execute said documents.

Schmitt/Creighton-Smith
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-473.

Resolution approving a Joint Funding Agreement with the United States Department of the Interior Geological Survey Central Midwest Water Science Center, in the amount of $11,140.00, for operation and maintenance of one steamgaging station, and authorizing the Mayor and City Clerk to execute said document.

Schmitt/Creighton-Smith
Roll Call vote-Ayes: Seven. Motion carried. Resolution adopted and upon approval by Mayor assigned No. 2026-474.

PUBLIC COMMENTS

The following individuals commented on a variety of subjects:

Mary Potter, 1416 W. 4th Street / Jean Miller, Main Street Board of Directors / Shane Grote, 2229 Edgemont / Dan Alton, 10 W. 4th Street / Terry Slickers, 1745 Corning Avenue / Michael Blackwell, 5125 Millenium Drive / LaTonya Graves, Black Hawk County NAACP / Aaron Stacey Roberts, 411 Almond

Simon/Martin
to close public comments. Voice vote-Ayes: Seven. Motion carried.

Ms. Creighton-Smith commented on the need to address staffing in the Human Rights Commission. She added that there is a Ward 3 and 4 meeting on August 20th at the Waterloo Public Library.

Ms. Berry commented that additional Code Enforcement Officers need to be hired. She encouraged the city to hire additional staff in the Human Rights Department.

Mr. Morrow shared that he has a Ward 2 meeting on August 27 in Room A at the Library from 5:30 p.m.- 6:30 p.m.

Mr. Simon shared some comments on Code Enforcement and encouraged neighbors to help one another too.

Mr. Salamanca encouraged citizens to continue reaching out to him and asked that people consider getting involved in improving our community and joining any of our commissions that have an opening.

Mayor Boesen shared that there are several boards and commissions with vacancies and encouraged people to apply.

ADJOURNMENT

Simon/Martin
that the council adjourn at 7:16 p.m. Voice vote-Ayes: Seven. Motion carried.

_____
Kelley Felchle
City Clerk

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Finance Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Resolution setting date of public hearing as October 5, 2026, for the authorization of a loan and disbursement agreement and the issuance of not to exceed $3,968,000.00 Sewer Revenue Capital Loan Notes of the City of Waterloo, Iowa, and instructing the City Clerk to publish notice.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Waterloo (186) - PDF Letter of Instruction Fix Date 2026D Sewer SRF
2. Waterloo (186) - Fix Date Proceedings 2026D Sewer SRF

3. Waterloo (186) - Notice of Hearing 2026D Sewer SRF

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Kristin S.B. Cooper
515.246.0330
kcooper@ahlerslaw.com

August 25, 2026

VIA E-MAIL

Kelley Felchle
City Clerk
715 Mulberry
Waterloo, Iowa 50703
kelley.felchle@waterloo-ia.org

Re: Waterloo, Iowa - Not to Exceed $3,968,000 Sewer Revenue Capital Loan Notes (State of Iowa Revolving Fund Loan)

Dear Kelley:

We have now prepared suggested proceedings for the September 8, 2026 Council Meeting to fix the date of a meeting on the proposition to issue a tax-exempt sewer SRF Note and ordering publication of a notice of public hearing.

As you know, the borrowing of loan funds by the City through the Iowa Water Pollution Control Works Financing Program involves the same procedures applicable to the issuance and sale of municipal bonds generally. In this instance, the Iowa Finance Authority (the "Authority") has agreed to make the City a low-interest loan under the terms of a Loan and Disbursement Agreement, which will be secured and evidenced by a Sewer Revenue Capital Loan Note that will be issued to the Authority at the time the loan is closed. The terms of the loan being offered to the City are established primarily by reference to two external sources: the Authority's administrative rules governing the SRF Program and, to a lesser extent, by the terms of the bonds issued by the Authority to fund the City's loan. These loan terms are not negotiable by individual borrowers, and the City's decision to participate in the Program effectively commits it to accept a loan on the stated terms.

The Authority has advised that all Revolving Fund loans are subject to additional procedural requirements, most notably - compliance with prevailing wage (Davis-Bacon) provisions. We will coordinate with the Authority on your behalf to properly document this loan program, but will defer to your engineers for contract compliance requirements. Be advised, all bid lettings in the Program require an opinion from counsel on legal conformance with the Iowa Code, generally given by the attorney handling the legal proceedings. We understand your bidding opinion will be provided by the City Attorney. Finally, the Authority will issue a "Notice of Funding Eligibility" (NOFE) upon review and approval of the project details. In

certain circumstances, not all project costs are eligible under the Program. If you move forward with a contract award ahead of the issuance of a NOFE, be advised of the risk certain costs may need to be funded from sources other than the loan under the Program contemplated herein.

Notice of this meeting must be published at least once in a legal newspaper, printed wholly in the English language, published at least once weekly, and having general circulation in the City. The date of publication is to be not less than four clear days nor more than twenty days before the date of the public meeting of the issuance of notes. In computing time, the date of publication should be excluded. If the last day falls on Sunday, the whole of the following Monday should be excluded. **For a public hearing on October 5th , the Notice must be published between September 15, 2026 and October 1, 2026. Please advise if this schedule is problematic.**

Please return one executed scan of the proceedings to us, together with the publisher's affidavit of publication of the notice of hearing. If you have any questions concerning the enclosed proceedings or the SRF Program, please do not hesitate to contact me.

Very truly yours,

AHLERS & COONEY, P.C.



Kristin Cooper
FOR THE FIRM

KBC:seb
Enclosures (via email)
cc: LeAnn Even, Deputy City Clerk, City of Waterloo, leann.even@waterloo-ia.org
Bridgett Wood, Finance Director, City of Waterloo, Bridgett.Wood@waterloo-ia.org
Kim Bahr, Financial Analyst, City of Waterloo, kim.bahr@waterloo-ia.org
Randy Bennett, Public Works Director, City of Waterloo randy.bennett@waterloo-ia.org
Nancy Higby, Administrative Secretary, City of Waterloo, Nancy.Higby@waterloo-ia.org
Noel Anderson, Planning & Zoning Director, City of Waterloo, noel.anderson@waterloo-ia.org
Maggie Burger, Speer Financial, mburger@speerfinancial.com
Charlotte Nielsen, Speer Financial, cnielsen@speerfinancial.com

4919-4294-8552-1\11310-186

ITEMS TO INCLUDE ON AGENDA
FOR THE COUNCIL MEETING ON SEPTEMBER 8, 2026

CITY OF WATERLOO, IOWA

Not to Exceed $3,968,000 Sewer Revenue Capital Loan Notes (State of Iowa Revolving Fund Loan)

- Resolution fixing date for a meeting on the proposition to authorize a Loan and Disbursement Agreement and the issuance of Notes to evidence the obligations of the City thereunder.

NOTICE MUST BE GIVEN PURSUANT TO IOWA CODE CHAPTER 21 AND THE LOCAL RULES OF THE CITY.

September 8, 2026

The City Council of the City of Waterloo, State of Iowa, met in _____ session, in the Council Chambers, City Hall, 715 Mulberry Street, Waterloo, Iowa 50703, at _____ _____.M., on the above date. There were present Mayor Dave Boesen, in the chair, and the following named Council Members:

_____

Absent: _____

Vacant: _____

* * * * * * *

Council Member _____ introduced the following Resolution entitled "RESOLUTION FIXING DATE FOR A MEETING ON THE AUTHORIZATION OF A LOAN AND DISBURSEMENT AGREEMENT AND THE ISSUANCE OF NOT TO EXCEED $3,968,000 SEWER REVENUE CAPITAL LOAN NOTES OF THE CITY OF WATERLOO, STATE OF IOWA, AND PROVIDING FOR PUBLICATION OF NOTICE THEREOF", and moved that the same be adopted. Council Member _____ seconded the motion to adopt. The roll was called and the vote was,

AYES: _____

_____

NAYS: _____

Whereupon, the Mayor declared the Resolution duly adopted as follows:

RESOLUTION NO._____

RESOLUTION FIXING DATE FOR A MEETING ON THE AUTHORIZATION OF A LOAN AND DISBURSEMENT AGREEMENT AND THE ISSUANCE OF NOT TO EXCEED $3,968,000 SEWER REVENUE CAPITAL LOAN NOTES OF THE CITY OF WATERLOO, STATE OF IOWA, AND PROVIDING FOR PUBLICATION OF NOTICE THEREOF

WHEREAS, it is deemed necessary and advisable that the City of Waterloo, State of Iowa, should provide for the authorization of a Loan and Disbursement Agreement and the issuance of Sewer Revenue Capital Loan Notes, in the amount of not to exceed $3,968,000, as authorized by Sections 384.24A and 384.83, of the Code of Iowa, for the purpose of providing funds to pay costs of carrying out project(s) as hereinafter described; and

WHEREAS, the City has applied for a loan through the Iowa Water Pollution Control Works Financing Program pursuant to which the Iowa Finance Authority has agreed to purchase the City's Notes and has requested that such Notes be issued as a single Note in a denomination equal to the total amount of the issue as authorized by Chapter 384 of the Code of Iowa; and

WHEREAS, the Loan and Disbursement Agreement and Notes shall be payable solely and only out of the Net Revenues of the Municipal Sewer System and shall be a first lien on the future Net Revenues of the Utility; and shall not be general obligations of the City or payable in any manner by taxation and the City shall be in no manner liable by reason of the failure of the

Net Revenues to be sufficient for the payment of the Loan and Disbursement Agreement and Notes; and

WHEREAS, before a Loan and Disbursement Agreement may be authorized and Sewer Revenue Capital Loan Notes issued to evidence the obligations of the City, it is necessary to comply with the provisions of the Code of Iowa, as amended, and to publish a notice of the proposal to issue such notes and of the time and place of the meeting at which the Council proposes to take action for the authorization of the Loan and Disbursement Agreement and Notes and to receive oral and/or written objections from any resident or property owner of the City to such action.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WATERLOO, STATE OF IOWA:

Section 1. That this City Council meet in the Council Chambers, City Hall, 715 Mulberry Street, Waterloo, Iowa 50703, at _____ _____.M., on the 5th day of October, 2026, for the purpose of taking action on the matter of the authorization of a Loan and Disbursement Agreement and the issuance of not to exceed $3,968,000 Sewer Revenue Capital Loan Notes to evidence the obligations of the City thereunder, the proceeds of which notes will be used to provide funds to pay the costs of acquisition, construction, reconstruction, extending, remodeling, improving, repairing and equipping all or part of the Municipal Sewer System, including those costs associated with the Cattle Congress Sanitary Sewer Lift Station Reconstruction Project.

Section 2. That the Clerk is hereby directed to cause at least one publication to be made of a notice of the meeting, in a legal newspaper, printed wholly in the English language, published at least once weekly, and having general circulation in the City. The publication to be not less than four clear days nor more than twenty days before the date of the public meeting on the issuance of the Notes.

Section 3. The notice of the proposed action to issue notes shall be in substantially the following form:

(To be published between: September 15, 2026 and October 1, 2026)

NOTICE OF MEETING OF THE CITY COUNCIL OF THE CITY OF WATERLOO, STATE OF IOWA, ON THE MATTER OF THE PROPOSED AUTHORIZATION OF A LOAN AND DISBURSEMENT AGREEMENT AND THE ISSUANCE OF NOT TO EXCEED $3,968,000 SEWER REVENUE CAPITAL LOAN NOTES, AND THE PUBLIC HEARING ON THE AUTHORIZATION AND ISSUANCE THEREOF

PUBLIC NOTICE is hereby given that the City Council of the City of Waterloo, State of Iowa, will hold a public hearing on the 5th day of October, 2026, at _____ _____.M., in the Council Chambers, City Hall, 715 Mulberry Street, Waterloo, Iowa 50703, at which meeting the City Council proposes to take additional action for the authorization of a Loan and Disbursement Agreement by and between the City and the Iowa Finance Authority and the issuance to the Iowa Finance Authority of not to exceed $3,968,000 Sewer Revenue Capital Loan Notes, to evidence the obligations of the City under said Loan and Disbursement Agreement, in order to provide funds to pay the costs of acquisition, construction, reconstruction, extending, remodeling, improving, repairing and equipping all or part of the Municipal Sewer System, including those costs associated with the Cattle Congress Sanitary Sewer Lift Station Reconstruction Project. The Notes will not constitute general obligations or be payable in any manner by taxation, but will be payable from and secured by the Net Revenues of the Municipal Sewer System.

At the above meeting the City Council shall receive oral or written objections from any resident or property owner of the City to the above action. After all objections have been received and considered, the City Council will at this meeting or at any adjournment thereof, take additional action for the authorization of a Loan and Disbursement Agreement and the issuance of the Notes to evidence the obligation of the City thereunder or will abandon the proposal to issue said Notes.

This Notice is given by order of the City Council of the City of Waterloo, State of Iowa, as provided by Sections 384.24A and 384.83 of the Code of Iowa, as amended.

Dated this _____ day of _____, 2026.

_____

Kelley Felchle, City Clerk, City of Waterloo, State of Iowa

(End of Notice)

PASSED AND APPROVED this 8th day of September, 2026.

_____
Dave Boesen, Mayor

ATTEST:

_____
Kelley Felchle, City Clerk

CERTIFICATE

STATE OF IOWA)
) SS
COUNTY OF BLACK HAWK)

I, the undersigned City Clerk of the City of Waterloo, State of Iowa, do hereby certify that attached is a true and complete copy of the portion of the records of the City showing proceedings of the City Council, and the same is a true and complete copy of the action taken by the Council with respect to the matter at the meeting held on the date indicated in the attachment, which proceedings remain in full force and effect, and have not been amended or rescinded in any way; that meeting and all action thereat was duly and publicly held in accordance with a notice of public hearing and tentative agenda, a copy of which was timely served on each member of the Council and posted pursuant to the local rules of the Council and the provisions of Chapter 21, Code of Iowa, upon reasonable advance notice to the public and media at least twenty-four hours prior to the commencement of the meeting as required by law and with members of the public present in attendance; I further certify that the individuals named therein were on the date thereof duly and lawfully possessed of their respective City offices as indicated therein, that no Council vacancy existed except as may be stated in the proceedings, and that no controversy or litigation is pending, prayed or threatened involving the incorporation, organization, existence or boundaries of the City or the right of the individuals named therein as officers to their respective positions.

WITNESS my hand and the seal of the Council hereto affixed this _____ day of _____, 2026.

_____
Kelley Felchle, City Clerk, City of Waterloo, State of Iowa

(SEAL)

CERTIFICATE

STATE OF IOWA)
) SS
COUNTY OF BLACK HAWK)

I, the undersigned, do hereby certify that I am now and was at the times hereinafter mentioned, the duly qualified and acting Clerk of the City of Waterloo, in the County of Black Hawk, State of Iowa, and that as such Clerk and by full authority from the Council of the City, I have caused a

NOTICE OF MEETING OF THE CITY COUNCIL OF THE CITY OF WATERLOO, STATE OF IOWA, ON THE MATTER OF THE PROPOSED AUTHORIZATION OF A LOAN AND DISBURSEMENT AGREEMENT AND THE ISSUANCE OF NOT TO EXCEED $3,968,000 SEWER REVENUE CAPITAL LOAN NOTES, OF THE CITY OF WATERLOO, AND THE PUBLIC HEARING ON THE AUTHORIZATION AND ISSUANCE THEREOF

of which the clipping annexed to the publisher's affidavit hereto attached is in words and figures a correct and complete copy, to be published as required by law in the "_____", a legal newspaper published at least once weekly, printed wholly in the English language, published regularly and mailed through the post office of current entry for more than two years and which has had for more than two years a bona fide paid circulation recognized by the postal laws of the United States, and has a general circulation in the City, and that the Notice was published in all of the issues thereof published and circulated on the following date:

_____, 2026.

WITNESS my official signature at Waterloo, Iowa, this _____ day of _____, 2026.

_____
Kelley Felchle, City Clerk, City of Waterloo, State of Iowa

(SEAL)

4896-7704-1352-1\11310-186

(To be published between: September 15, 2026 and October 1, 2026)

NOTICE OF MEETING OF THE CITY COUNCIL OF THE CITY OF WATERLOO, STATE OF IOWA, ON THE MATTER OF THE PROPOSED AUTHORIZATION OF A LOAN AND DISBURSEMENT AGREEMENT AND THE ISSUANCE OF NOT TO EXCEED $3,968,000 SEWER REVENUE CAPITAL LOAN NOTES, AND THE PUBLIC HEARING ON THE AUTHORIZATION AND ISSUANCE THEREOF

PUBLIC NOTICE is hereby given that the City Council of the City of Waterloo, State of Iowa, will hold a public hearing on the 5th day of October, 2026, at _____ _____.M., in the Council Chambers, City Hall, 715 Mulberry Street, Waterloo, Iowa 50703, at which meeting the City Council proposes to take additional action for the authorization of a Loan and Disbursement Agreement by and between the City and the Iowa Finance Authority and the issuance to the Iowa Finance Authority of not to exceed $3,968,000 Sewer Revenue Capital Loan Notes, to evidence the obligations of the City under said Loan and Disbursement Agreement, in order to provide funds to pay the costs of acquisition, construction, reconstruction, extending, remodeling, improving, repairing and equipping all or part of the Municipal Sewer System, including those costs associated with the Cattle Congress Sanitary Sewer Lift Station Reconstruction Project. The Notes will not constitute general obligations or be payable in any manner by taxation, but will be payable from and secured by the Net Revenues of the Municipal Sewer System.

At the above meeting the City Council shall receive oral or written objections from any resident or property owner of the City to the above action. After all objections have been received and considered, the City Council will at this meeting or at any adjournment thereof, take additional action for the authorization of a Loan and Disbursement Agreement and the issuance of the Notes to evidence the obligation of the City thereunder or will abandon the proposal to issue said Notes.

This Notice is given by order of the City Council of the City of Waterloo, State of Iowa, as provided by Sections 384.24A and 384.83 of the Code of Iowa, as amended.

Dated this _____ day of _____, 2026.

_____
Kelley Felchle, City Clerk, City of Waterloo, State of Iowa

(End of Notice)

4928-4925-7418-1\11310-186

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Noel Anderson, Community Planning and Development Director
Planning & Zoning Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution setting date of public hearing as September 21, 2026, to approve a request by Yashpal Saini to rezone approximately 5.29 acres from “A-1” Agricultural District to “R-2” One and Two Family Residence District in order to split the lots to allow for the construction of single-family homes located south of 1220 Bishop Avenue to 1304 Bishop Avenue, and instruct the City Clerk to publish notice.

RECOMMENDED COUNCIL ACTION

Approval

SUMMARY STATEMENT AND BACKGROUND INFORMATION

The rezone request meets the requirements of the zoning ordinance as all of the buildable parcels are wider than 50 feet, and larger than 6,000 square feet.
The applicants are not looking to subdivide the property at this time, but may be looking to subdivide the property at some point in the future. Further approvals may be required for the splitting of lots or a larger subdivision of the land. If a subdivision plat is needed to split the parcels, then a drainage plan will be required.
The applicant is proposing to rezone 5.29 acres. There are 5 existing parcels in the rezone area. One of the lots is covered by an easement and is not buildable. It was a city right-of-way that was vacated by Ordinance #4769 in April of 2005. There are two homes on two of the other parcels.
The rezone from “A-1” Agricultural District to “R-2” One and Two Family Residence District will allow for the parcels to be split, to create more buildable lots. The rezone would allow for homes to be immediately built on one of the lots. One of the lots would be buildable after an access easement was granted for that lot, as it does not have street frontage. If homes were built on those lots, the parcels still could be split in the future.
The Planning, Programming and Zoning Commission recommended approval of the request unanimously at their regular meeting on August 11, 2026.

NEIGHBORHOOD IMPACT

The rezone request would not appear to have a negative impact upon the surrounding area as the area is comprised primarily of residential uses.

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

The Planning, Programming, and Zoning Commission recommended approval of the request with a unanimous vote at their regularly scheduled meeting on August 11, 2026, and notice was sent to property owners within 250 feet.

SOURCE OF EXPENDITURES

N/A

ALTERNATIVE ACTION

LEGAL DESCRIPTION

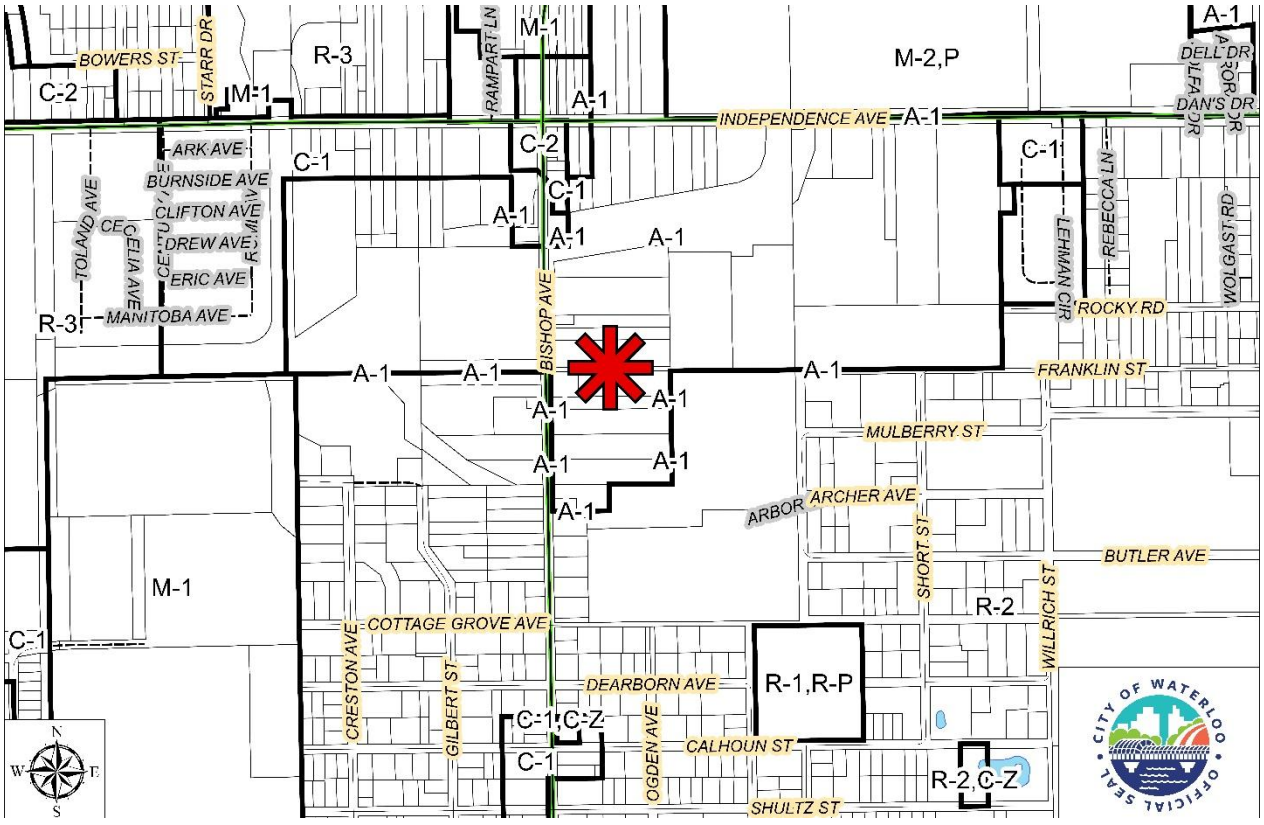
Parcel "D" of Plat of Survey Doc. #2005-26316 filed May 13, 2005, being a part of the Northwest Quarter of the Southeast Quarter of the Northwest Quarter of Section 29, Township 89 North, Range 12 West of the Fifth Principal Meridian in Black Hawk County, Iowa.
AND
The South 2 1/2 acres of the Southwest Quarter of the Northeast Quarter of the Northwest Quarter of Section No. 29, Township No. 89 North, Range No. 12 West of the Fifth Principal Meridian, Black Hawk County, Iowa, except that part conveyed for road purposes in 102 LD 31.
AND
The South One (1) Acre of the North Three (3) acres of the Northwest Quarter of the Southeast Quarter of the Northwest Quarter of Section No. Twenty-nine (29), Township No. Eighty-nine (89) North, Range No. Twelve (12) West of the Fifth (5th) Principal Meridian, Black Hawk County, Iowa, (now in the City of Waterloo, Iowa).
AND
The North 2 acres of the Northwest Quarter of the Southeast Quarter of the Northwest Quarter (NW 1/4, SE 1/4, NW 1/4), except the West 170.50 feet thereof, all in Section 29, Township 89 North (T89N), Range 12 West (R12W) of the Fifth Principal Meridian (5th P.M.), all in Black Hawk County, State of Iowa.

ATTACHMENTS

1. Staff report- Bishop rezone

CITY OF WATERLOO
Planning & Zoning

TO:	Planning, Programming, and Zoning Commission
PREPARER:	Joseph Geilman, Planner I
PZ MEETING DATE:	August 11, 2026
REQUEST:	Rezone 5.29 acres from “A-1” Agricultural District to “R-2” One and Two Family Residence District.
APPLICANT:	Yashpal Saini
LOCATION:	South of 1220 Bishop Avenue to 1304 Bishop Avenue.

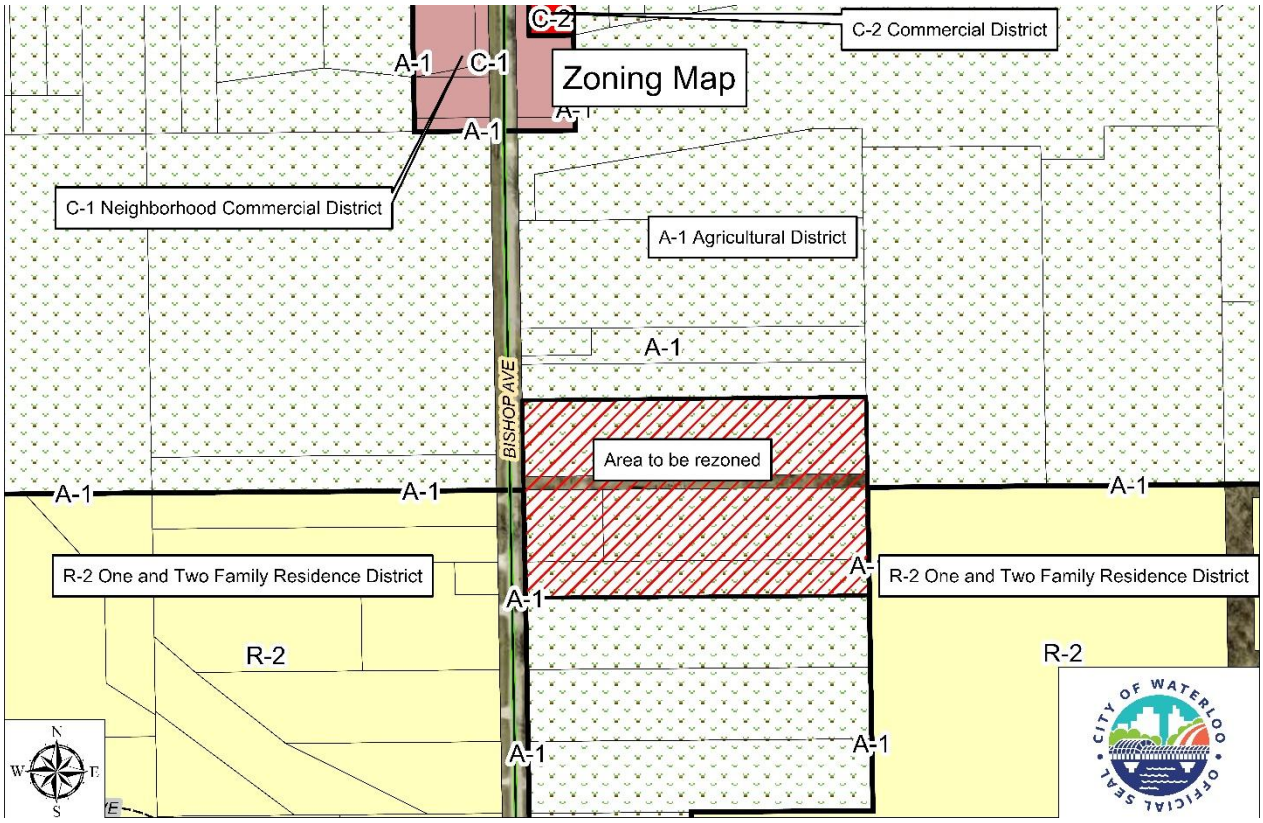


SURROUNDING LAND USES AND IMPACT ON NEIGHBORHOOD:

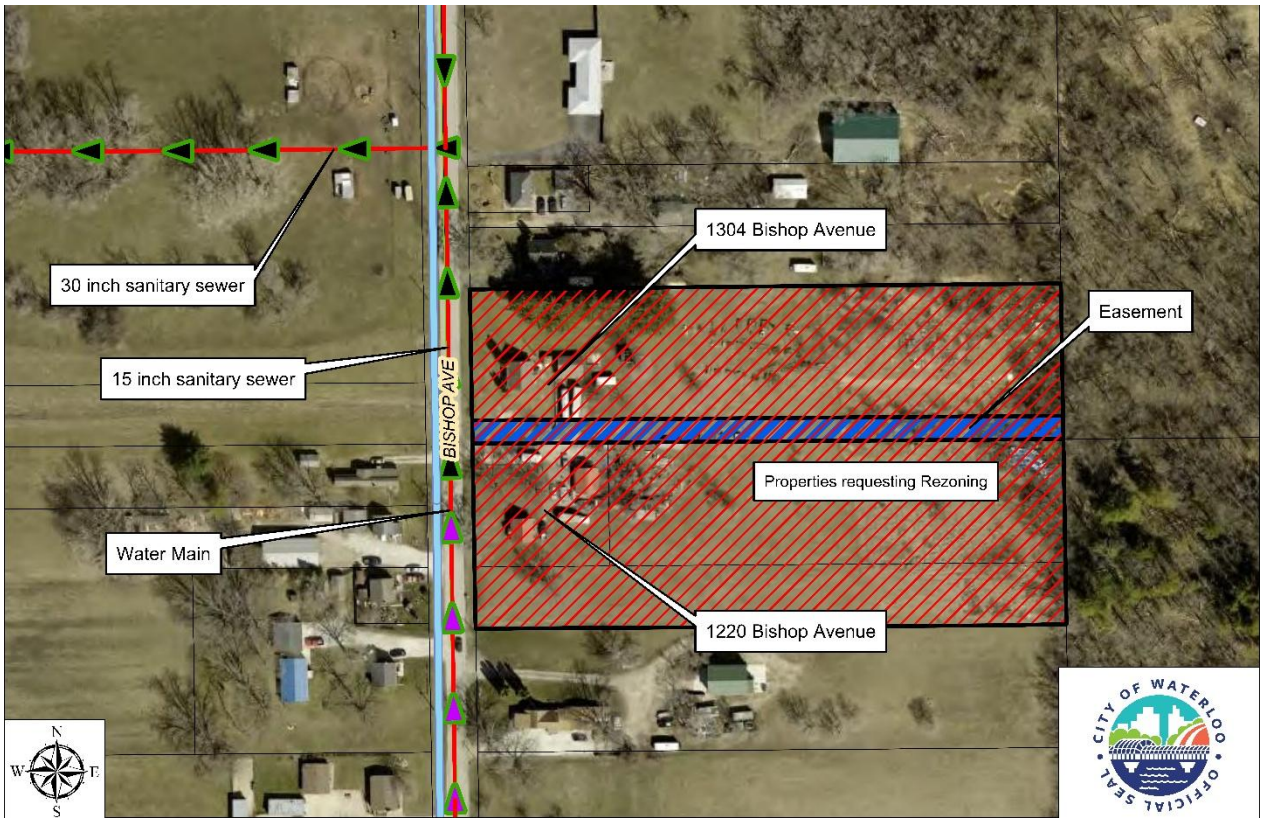
The rezone request would not appear to have a negative impact upon the surrounding area as the area is comprised primarily of residential uses.



VEHICULAR & PEDESTRIAN TRAFFIC CONDITIONS:	The proposed rezone request would not appear to have a negative impact upon vehicular or pedestrian traffic conditions in the area. The site is served by Bishop Avenue, which is classified as a local road.
RELATIONSHIP TO RECREATIONAL TRAIL PLAN AND COMPLETE STREETS POLICY:	There are no recreational trails located near the site. There are no sidewalks along either side of Bishop Avenue.
ZONING HISTORY FOR SITE AND IMMEDIATE VICINITY:	The area in question has been zoned “A-1” Agricultural District since the adoption of the zoning ordinance in 1969. Surrounding land uses and their zoning designations are as follows: **North** – Residential properties, zoned “A-1” Agricultural District. **South** – Residential properties, zoned “A-1” Agricultural District. **East** – Residential properties, zoned “R-2” One and Two Family Residence District. **West** – Residential properties, zoned “R-2” One and Two Family Residence District.



DEVELOPMENT HISTORY:	The surrounding area consists of primarily single family dwellings built between 1940 and 1949.
PUBLIC /OPEN SPACES/ SCHOOLS:	Highland Elementary School and the Expo Alternative Learning Center are approximately 3,500 feet away from the rezone area. Maywood Park is approximately 2,500 feet to the southeast of the rezone area.
FLOODPLAIN:	No portion of the rezone area is located within a special flood hazard area as indicated by the Federal Insurance Administration's Flood Insurance Rate Map, Community number 190025, Panel number 0306F, dated July 18, 2011.
DRAINAGE:	A storm water detention plan will not be needed for this request.
UTILITIES: WATER, SANITARY SEWER, STORM SEWER, ETC.	There are overhead utility lines running along Bishop Avenue. There is also a 12” Sanitary Sewer Line and an 8” Water Main running in the right-of-way for Bishop Avenue. There is also an easement over the parcel between 1220 Bishop Avenue and 1304 Bishop Avenue, which is vacated city right-of-way.



STAFF ANALYSIS – ZONING ORDINANCE

The rezone request meets the requirements of the zoning ordinance as all of the buildable parcels are wider than 50 feet, and larger than 6,000 square feet.

STAFF ANALYSIS – SUBDIVISION ORDINANCE

The applicants are not looking to subdivide the property at this time, but may be looking to subdivide the property at some point in the future. Further approvals may be required for the splitting of lots or a larger subdivision of the land. If a subdivision plat is needed to split the parcels, then a drainage plan will be required.

STAFF ANALYSIS – SITE ANALYSIS:

The applicant is proposing to rezone 5.29 acres. There are 5 existing parcels in the rezone area. One of the lots is covered by an easement and is not buildable. It was a city right-of-way that was vacated by Ordinance #4769 in April of 2005. There are two homes on two of the other parcels.

The rezone from “A-1” Agricultural District to “R-2” One and Two Family Residence District will allow for the parcels to be split, to create more buildable lots. The rezone would allow for homes to be immediately built on one of the lots. One of the lots would be buildable after an access easement was granted for that lot, as it does not have street frontage. If homes were built on those lots, the parcels still could be split in the future.



Picture 1: Existing residence at 1304 Bishop.



Picture 2: Residence to the north of the site at 1328 Bishop Avenue



Picture 3: Residence and accessory structure at 1220 Bishop Avenue and adjacent lot.



Picture 4: Accessory structure at 1220 Bishop Avenue.

TECH REVIEW AND UPDATES	In the Technical Review Committee, the Engineering Department noted that a drainage plan may be needed in the future, depending on how the parcels get split.
PLANNING, PROGRAMMING AND ZONING COMMISSION	The Planning, Programming and Zoning Commission recommended approval of the request unanimously at their regular meeting on August 11, 2026.
RELATIONSHIP TO COMPREHENSIVE LAND USE PLAN:	The Future Land Use Map, a component of the Comprehensive Plan, designates this area as “Low Density Residential (1 & 2 Family)” This request is in compliance with that designation.



STAFF RECOMMENDATION:	Therefore, staff recommends that the request by Yashpal Saini to rezone approximately 5.29 acres from “A-1” Agricultural District to “R-2” One and Two Family Residence District in order to split the lots to allow for the construction of single-family homes located south of 1220 Bishop to 1304 Bishop, be approved for the following reasons: 1. The request is in conformance with the Comprehensive Plan and Future Land Use Map for this area. 2. The request would not appear to have a negative impact on traffic conditions in the area.

3. The request would not appear to have a negative impact upon the surrounding area and would allow for one and two family homes to be built.

And with the following conditions(s):

1. That the final site plan meets all applicable city codes, regulations, etc. including, but not limited to, parking, landscaping, screening, drainage, etc.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Noel Anderson, Community Planning and Development Director
Planning & Zoning Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution approving preliminary plans, specifications, form of contract, etc., setting date of bid opening as October 8, 2026, and date of public hearing as October 19, 2026, for the renovation of 100 E. 4th Street, for Waterloo City Hall and Police Department, and instruct the City Clerk to publish notice.

RECOMMENDED COUNCIL ACTION

Approval

SUMMARY STATEMENT AND BACKGROUND INFORMATION

Transmitted herewith is a resolution approving preliminary plans, specifications, form of contract, etc., setting date of bid opening as October 8, 2026, and date of public hearing as October 19, 2026, for the renovation of 100 E. Park Avenue for Waterloo City Hall and Police Department.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. 24102 New City Hall Police Headquarters SPEC VOL1 BD 20260826
2. 24102 New City Hall Police Headquarters SPEC VOL2 BD 20260826
3. 24102_WLO_City_Hall_Move_CDs_Complete

PROJECT MANUAL FOR:

F.Y. 2026
New City Hall - Police Headquarters

100 E 4th St.
Waterloo, IA 50703

City of Waterloo Contract No. 1154

VOLUME 1

Volume 1: Division 00 thru 12
Volume 2: Division 21 thru 32

August 26, 2026
Bid Documents

Prepared for:

City of Waterloo
715 Mulberry Street
Waterloo, Iowa 50703

Prepared by:
IMEG Corporation
INVISION Architecture
MODUS Engineering

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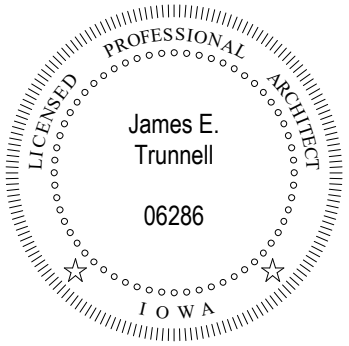

I hearby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed architect under the laws of the State of Iowa.

James E. Trunnell

Printed or typed name — Date

Signature

June 30, 2027

Registration expires

DIV 01-12, 31, 32 Unless specifically noted otherwise

Pages or sheets covered by this seal



I hearby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Michael P. Merron

Printed or typed name — Date

Signature

December 31, 2027

Registration expires

Sections: 031000, 032000, 033000, 034100, 042000, 051223, 052100
316329

Pages or sheets covered by this seal



I hearby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Aaron J. Oltmann

Printed or typed name — Date

Signature

December 31, 2027

Registration expires

DIV 21, 22, 23

Pages or sheets covered by this seal



I hearby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Steven F. Wagner
Printed or typed name — Date

Signature

December 31, 2027
Registration expires

DIV 26, 27, 28
Pages or sheets covered by this seal

END OF SECTION

SECTION 00 01 10

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MODUS Engineering	MEPT	(MODUS)

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NOTICE TO BIDDERS
For the Taking of Construction Bids for the
F.Y. 2026 NEW CITY HALL - POLICE HEADQUARTERS
In the City of Waterloo, Iowa
CONTRACT NO. 1154

RECEIVING OF BIDS

Sealed proposals will be received by the City Clerk of the City of Waterloo, Iowa, at her office in the City Hall of the said City on the 8th day of October, 2026 until 1:00 p.m. for the construction of the **F.Y. 2026 NEW CITY HALL - POLICE HEADQUARTERS, Contract No. 1154**, as described in detail in the plans and specifications now on file in the Office of the City Clerk.

OPENING OF BIDS

All proposals received will be opened in the Harold E. Getty Council Chambers in City Hall, in the City of Waterloo, Iowa, on the 8th day of October, 2026 at 1:00 p.m., and the proposals will be acted upon at such later time and place as may then be fixed by the City Council.

PUBLIC HEARING

Notice is hereby given that the Council of said City will conduct a public hearing on the proposed plans, specifications, form of contract, and estimate of cost for the construction of the above-described improvement project at 5:30 p.m. on the 19th day of October, 2026, said hearing to be held in the Harold E. Getty Council Chambers in City Hall in said City.

SCOPE OF WORK

This project consists of the renovation of three floors (approximately 48,000 SF) of the existing building at 100 E. 4th St. in Waterloo to serve as Waterloo City Hall and police headquarters. A 900 SF storm shelter will also be included as an alternate bid item.

BEGINNING AND COMPLETION DATES

Not used. Refer to 01 10 00 Summary.

METHOD OF PAYMENT TO CONTRACTOR

The Contractor will be paid against bi-monthly estimates in cash on the basis of ninety-seven percent (97%) of the work as it is completed and materials delivered and work approved. Final payment will be made thirty-one (31) days after completion of the work and acceptance by the Council. Before final payment is made, vouchers showing that
all subcontractors and workmen and all persons furnishing materials have been fully paid for such materials and labor will be required unless the City is satisfied that material, men and laborers have been paid.

The Contractor is hereby notified that if the City does not have cash on hand to pay monthly pay estimates, according to Chapter 384.57 of the Code of Iowa, payment may be made by anticipatory warrants issued bearing a rate of interest not exceeding that permitted by Chapter 74A, Code of Iowa.

PLANS AND SPECIFICATIONS

Plans and Specifications governing the construction of the proposed improvements have been prepared by the City of Waterloo which plans and specifications and also the prior proceedings of the City Council referring to and defining said proposed improvements are hereby made a part of this notice, and the proposed contract by reference shall be executed in compliance therewith.

Complete digital Plans and Specifications are available at:

https://www.rapidsreproplanroom.com/

Please DO NOT obtain Bid Documents from any source other than stated above. Obtaining documents through any other source could prevent Bidder from being included on the official Plan Holders List, which, in turn, may cause the Bidder to not receive addenda or other time-sensitive / bid-critical documents. The City has the right to reject any bids that do not have current bidding documents included in the proposal.

Upon award of project, the prime contractor, subcontractors and suppliers shall be supplied with the needed number of plans and specifications at no additional cost.

CONTRACT AWARD

A contract will be awarded to the qualified bidder submitting the lowest bid.

The City reserves the right to reject any or all bids, re-advertise for new bids, and to waive informalities in the bids submitted that might be in the best interest of the City.

Bids may be held by the City of Waterloo, Iowa, for a period not to exceed forty-five (45) days from the day of the opening of bids for the purpose of reviewing the bids and investigating the qualifications of bidders, prior to awarding the contract.

By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced with the State of Iowa and preference will be given to local domestic labor in the construction of the improvement.

PROPOSALS SUBMITTED

The bidder shall submit bids on the items listed in the proposal. The bidder shall clearly write or type the unit bid price and the bid item extension (Unit Price x Estimated Qty) in numerals on the blanks provided. Should there be any discrepancy between the unit bid price and extension, the City of Waterloo shall consider the unit bid price as being the valid unit bid price.

The bidder has the option to submit a computer-generated spreadsheet in lieu of the portion of the Form of Bid or Proposal, which includes the Bid Item Number, Description, Unit, Estimated Quantity, Unit Bid Price, Total Bid Price and Total Bid. The computer-generated spreadsheet shall include all of the information listed in that portion of the Form of Bid or Proposal as well as bear the signature of the Prime Contractor submitting the bid. For the bidders who submit a computer-generated spreadsheet, the TOTAL BID (with alternates, if applicable) shall also be indicated in the space(s) provided on the Form of Bid or Proposal.

BID SECURITY REQUIRED

All bids must be accompanied in a separate envelope by a certified or cashier's check drawn on an Iowa bank, or a bank chartered under the laws of the United States, a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States, or bid bond, (on the form furnished by the City) payable to the City of Waterloo, Iowa, in the sum of not less than five percent (5%) of the bid submitted, which certified check, certified share draft or bid bond will be held as security that the Bidder will enter into a Contract for the construction of the work and will furnish the required bonds, and in case the successful Bidder shall fail or refuse to enter into the Contract and furnish the required bonds, his bid security may be retained by said City as agreed upon liquidated damages. If bid bond is used, it must be signed by both the Bidder and the surety or surety's agent. Signature of surety's agent must be supported by accompanying Power of Attorney.

PERFORMANCE & PAYMENT BONDS

The successful bidder will be required to furnish a "Performance Bond" and a "Payment Bond" within ten (10) days after forms are presented to him in an amount equal to one hundred percent (100%) of the contract price, said bond to be issued by a responsible surety approved by the City Council and shall guarantee the faithful performance of the contract and the terms and conditions therein contained, and shall guarantee the prompt payment of all materials and labor and protect and save harmless the City from claims of any kind caused by the operations of the contractor.

MAINTENANCE BOND

Not used.

LIQUIDATED DAMAGES

Not used.

PRE-CONSTRUCTION CONFERENCE

Before the work is commenced on this contract, a conference shall be held for the purpose of discussing the contract. The conference shall be attended by the prime contractor, subcontractors and City Officials.

BIDDER STATUS

Attention of bidders is called to compliance with the provisions of the Resident Bidder/Non-Resident Bidder requirements.

Each bidder submitting a bid shall execute and include with the bid, a Bidder Status Form in the form herein provided.

Failure to submit a fully completed Bidder Status Form with the bid may result in the bid being deemed nonresponsive and rejected.

SALES TAX EXEMPTION CERTIFICATES

Contractors and approved subcontractors will be provided a Sales Tax Exemption Certification to purchase building materials or supplies in the performance of construction contracts let by the City of Waterloo.

Posted pursuant to the provisions of Chapter 26 of the City Code of Iowa.

CITY OF WATERLOO, IOWA

NOTICE OF PUBLIC HEARING
On Proposed Plans, Specifications, Form of Contract,
And Estimate of Cost
For the
F.Y. 2026 NEW CITY HALL - POLICE HEADQUARTERS
In the City of Waterloo, Iowa

CONTRACT NO. 1154

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The NOTICE TO BIDDERS can be viewed at the following locations:

1) City of Waterloo web site at

   https://www.rapidsreproplanroom.com/

2) Plan Room Web sites:
   Master Builders of Iowa web site at https://mbisource1.build.

SCOPE OF WORK

This project consists of the renovation of three floors (approximately 48,000 SF) of the existing building at 100 E. 4th St. in Waterloo to serve as Waterloo City Hall and police headquarters. A 900 SF storm shelter will also be included as an alternate bid item.

Published pursuant to the provisions of Chapter 26 of the City Code of Iowa and upon order to the City Council of said Waterloo, Iowa.

CITY OF WATERLOO, IOWA

BY: _____
Kelley Felchle
City Clerk

INSTRUCTIONS TO BIDDERS

1. EXPLANATIONS TO BIDDERS

Any explanation desired by a bidder regarding the meaning or interpretation of the Notice to Bidders, Plans, Specifications, etc., must be requested in writing and with sufficient time allowed for a reply to reach bidders before submission of their bids. Any interpretation made will be in the form of an amendment of the Notice to Bidders, Plans, Specifications, etc., and will be furnished to all prospective bidders. Its receipt by the bidder must be acknowledged in the space provided on the Proposal Form or by letter or telegram received before the time set for opening of bids. Oral explanations or instructions given before the award of the contract will not be binding.

1. PREBID CONFERENCE

a. A Pre-Bid Conference will be held at 1:00 p.m., September 17, 2026, at New City Hall / Police Headquarters, 100 E. 4th St. Waterloo, IA 50703.

b. All prime contract bidders, sub-contractors and suppliers are invited to attend.

c. Representatives of Design Professional will be in attendance.

d. Summarized minutes of this meeting will be circulated to attendees. These minutes will not form part of the Contract Documents.

e. Information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

2. EXAMINATION OF PROPOSED WORK

a. Interested bidders will have opportunity to examine the project site immediately after the pre-bid conference. Tentatively this site walk-thru will immediately follow the pre-bid conference at 1:00 p.m., September 17, 2026 at New City Hall / Police Headquarters, 100 E. 4th St. Waterloo, IA 50703.

b. Bidders should visit the site and take such other steps as may be reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Failure to do so will not relieve bidders from responsibility for estimating properly the difficulty or cost of successfully performing the work. The owner will assume no responsibility for any understanding or representation concerning conditions made by any of its officers or agents prior to the execution of the contract, unless included in the Notice to Bidders, the Specifications or related documents.

3. PREPARATION OF BIDS

a. Bids shall be submitted on the forms furnished, or copies thereof, and must be manually signed. If erasures or other changes appear on the forms, each erasure or change must be initialed by the person signing the bid.

The bidder has the option to submit a computer-generated spreadsheet in lieu of the portion of the Form of Bid or Proposal, which includes the Bid Item Number, Description, Unit, Estimated Quantity, Unit Bid Price, Total Bid Price, and Total Bid. The computer- generated spreadsheet shall include all of the information listed in that portion of the Form of Bid or Proposal as well as bear the signature of the Prime Contractor submitting the bid. For the bidders who submit a computer-generated spreadsheet, the TOTAL BID (with alternates, if applicable) shall also be indicated in the space(s) provided on the Form of Bid or Proposal.

b. The Bid Form may provide for submission of a price or prices for one or more items, which may be lump sum bids, alternate prices, schedule items resulting in a bid on a unit of construction or a combination thereof, etc. When the Bid Form explicitly requires that the bidder bid on all items, failure to do so will disqualify the bid. When submission of a price on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

c. Unless called for, alternate bids will not be considered.

d. Modifications of bids already submitted will be considered if received at the office designated in the Notice to Bidders by the time set for closing of bids. Telegraphic modifications will be considered, but should not reveal the amount of the original or revised bid.

e. In preparing his bid, the bidder shall specify the price, written legibly in ink or with the typewriter, at which he proposes to do each item of work. The unit price shall be stated in figures in the blank space provided (i.e., $7.14). In items where unit price is required, the total amount of each item shall be computed at the unit prices bid for the quantities given on the Bid Form and stated in figures in the blank space provided.

   If the bidder chooses to submit the unit prices, total bid price, and total bid on a computer-generated spreadsheet, all numbers shall be easily legible.

f. Any changes or alterations made in the Bid Form, or any addition thereto, may cause the rejection of the bid. No bid will be considered which contains a clause in which the contractor reserves the right to accept or reject a contract awarded him by the city Council of Waterloo. Bids in which the unit prices are obviously unbalanced may be rejected.

g. If the bidder does not qualify as a resident bidder, the nonresident bidder shall specify on the project proposal whether any preference to resident bidders, including but not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country is in effect in the nonresident bidder's state or country of domicile at the time of a bid submittal.

4. SUBMISSION OF BIDS

a. A bid must be sealed in a separate envelope and marked to indicate its contents and be accompanied by the bid security in a separate envelope. If forwarded by mail, the two envelopes shall be placed in a third and mailed to the City Clerk/Auditor. All bids must be filed with the City Clerk/Auditor of the City of Waterloo at their office in the City Hall before the time specified for closing bids.

b. Bids received prior to the advertised hour of opening will be securely kept sealed. The officer whose duty it is to open them will decide when the specified time has arrived, and no bid received thereafter will be considered; except that when a bid arrives by mail after the time fixed for opening, but before the reading of all other bids is completed, and it is shown to the satisfaction of the City of Waterloo, Iowa, that the non-arrival on time was due solely to delay in the mails for which the bidder was not responsible, such bid will be received and considered.

c. Bidders are cautioned that, while telegraphic modifications of bids may be received as provided above, such modifications, if not explicit and if in any sense subject to misinterpretation, shall made the bid so modified or amended, subject to rejection.

5. LATE BIDS AND MODIFICATIONS OR WITHDRAWALS

Bids and modifications or withdrawals thereof received at the office designated in the Notice to Bidders after the exact time set for closing of bids will not be considered. However, a modification which is received from an otherwise successful bidder, and which makes the terms of the bid more favorable to the City of Waterloo, will be considered at any time it is received and may therefore be accepted. Bids may be withdrawn by written or telegraphic request received from bidders prior to the time set for closing of bids.

6. PUBLIC OPENING OF BIDS

Bids will be publicly opened at that time and place set for opening in the Notice to Bidders. Their content will be made public for the information of bidders and others interested who may be present either in person or by representative.

7. BID SECURITY REQUIRED

All bids must be accompanied in a separate envelope by a certified or cashier's check drawn on an Iowa bank, or a bank chartered under the laws of the United States, a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States, or bid bond (on the form furnished by the City) payable to the City of Waterloo, Iowa, in the sum of not less than five percent (5%) of the bid submitted, which certified check, certified share draft or bid bond will be held as security that the Bidder will enter into a Contract for the construction of the work and will furnish the required bonds, and in case the successful Bidder shall fail or refuse to enter into the Contract and furnish the required bond, his bid security may be retained by said City as agreed upon liquidated damages. If bid bond is used, it must be signed by both the bidder and the surety or surety's agent. Signature of surety's agent must be supported by accompanying Power of Attorney.

8. COLLUSIVE AGREEMENTS

a. Each bidder submitting a bid shall execute and include with the bid, a Non-Collusion Affidavit in the form herein provided, to the effect that they have not colluded with any other person, firm, or corporation in regard to any bid submitted.

b. Each bidder submitting a bid shall have each proposed subcontractor, if any, execute and submit to the City Contract Compliance Officer by 5:00 P.M. the business day following the day bids on this project are due, a Non-Collusion Affidavit in the form herein provided, to the effect that he has not colluded with any other person, firm, or corporation in regard to any bid submitted. Before executing any subcontract, the successful bidder shall submit the name of any proposed subcontractor for approval by the City.

9. MINORITY AND/OR WOMEN BUSINESS ENTERPRISE SUBCONTRACTORS

Not used.

10. MBE/WBE CONTRACT COMPLIANCE PROGRAM

Not used.

11. EMPLOYMENT AND BUSINESS OPPORTUNITY

To the greatest extent feasible, suppliers, subcontractors, and low income workers owning businesses or living in the Waterloo area must be given priority in supplying materials, bidding for subcontract work, or applying for employment by the contractor on this project. Opportunities for training and for employment arising in connection with this project shall, to the greatest extent feasible, be made available to lower income persons residing in the project area. The contract area is the City of Waterloo.

The City of Waterloo will require the contractor to document his efforts in securing lower income workers living in the project area and in purchasing supplies from, and awarding subcontracts to,

businesses owned by persons residing in the project area.

12. STATEMENT OF BIDDER'S QUALIFICATIONS

Each bidder shall, upon request of the City of Waterloo, Iowa, submit on the form furnished for that purpose (a copy of which is included in the contract documents), a statement of bidder's qualifications, his experience record in constructing the type of improvements embraced, and his organization and equipment available for the work contemplated; and, when specifically requested, a detailed financial statement. The City of Waterloo, Iowa, shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform his obligations under the contract, and the bidder shall furnish the City of Waterloo, Iowa, all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available evidence or information does not satisfy the City of Waterloo, Iowa, that the bidder is qualified to carry out properly the terms of the contract.

13. AWARD OF CONTRACT

a. Award of contract will be made to that responsive and responsible bidder whose bid, conforming to the Specifications, is most advantageous to the City of Waterloo; price and other factors considered. The intention is to award the contract at the time of opening bids, but the right is reserved to postpone such action for a reasonable time, not exceeding forty-five (45) days.

b. The City Council may, when in its interest, reject any or all bids or waive any informality in bids received.

c. The bidder shall submit bids on all the items listed in the proposal and shall state the unit bid price in words in the blank spaces provided beneath the item description. Should there be any discrepancy between the unit bid price in words and listed numeral unit bid price, the City of Waterloo shall consider the unit bid price in words as being the valid unit bid price. A computer-generated spreadsheet as herein provided shall also be acceptable. Proposals requiring mathematical computations to determine unit prices or totals will be rejected. A contract will be awarded to the qualified bidder submitting the lowest total bid as indicated in the NOTICE TO BIDDERS.

d. When a contract for a public improvement is to be awarded to the lowest responsive and responsible bidder, a resident bidder shall be allowed a preference as against a nonresident bidder from a state or foreign country if that state or foreign country gives or requires any preference to bidders from that state or foreign country, including but not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country. The preference allowed shall be equal to the preference given or required by the state or foreign country in which the nonresident bidder is a resident. In the instance of a resident labor force preference, a nonresident bidder shall apply the same resident labor force preference to a public improvement in this state as would be required in the construction of a public improvement by the state or foreign country in which the nonresident bidder is a resident.

14. EXECUTION OF AGREEMENT, BONDS, AND CERTIFICATE OF INSURANCE

a. Subsequent to the award and within ten (10) days after the prescribed forms are presented for signature, the successful bidder shall execute and deliver to the City of Waterloo, Iowa, an agreement in the form included in the contract documents in such number of copies as the City of Waterloo, Iowa, may require.

b. Having satisfied all conditions of award as set forth elsewhere in these documents, the

successful bidder shall, within the period specified in paragraph "a" above, furnish a surety bond and a payment bond in a penal sum not less than the amount of the contract as awarded, as security for the faithful performance of the contract and terms and conditions therein contained and shall guarantee the prompt payment of all persons, firms, or corporations to whom the contractor may become legally indebted for labor, materials, tools, equipment, or services of any nature including utility and transportation services, employed or used by him in performing the work. The bonds shall protect and save harmless the City from claims and damages of any kind caused by the operations of the contractor and shall also guarantee the maintenance of the contract improvements for the period stated in the Notice of Hearing from and after completion of said improvements and their acceptance by the City. Such bonds shall be in the same form as that included in the contract documents and shall bear the same date as, or a date subsequent to that of the agreement. The current Power of Attorney for the person who signs for any surety company shall be attached to such bonds.

c. The successful bidder shall, within the period specified in paragraph "a" above, furnish a certificate of insurance for approval in amounts of not less than the amounts specified in the General Specifications for Construction. The certificate of insurance shall be furnished in such number of copies as the City of Waterloo may require. The City of Waterloo shall be named as an "Additional Insured." The contractor shall similarly submit his subcontractor's certificates of insurance in the amounts for approval before each commences work. The contractor shall carry or require that there be Worker's Compensation Insurance for all their employees and those subcontractors engaged in work at the site, in accordance with State Worker's Compensation Laws.

d. The failure of the successful bidder to execute such agreement and to supply the required bond or bonds within ten (10) days after the prescribed forms are presented for signature, or within such extended period as the City of Waterloo, Iowa, may grant, based upon reasons determined sufficient by the City of Waterloo, Iowa, may either award the contract to the next lowest bidder or re-advertise for bids, and may charge against the bidder the difference between the amount of the bid and the amount for which a contract for the work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the bid guaranty. If a more favorable bid is received by re- advertising, the defaulting bidder shall have no claim against the City of Waterloo, Iowa, for a refund.

15. BIDDER STATUS

a. Attention of bidders is called to the requirement of complying with the provisions of the Resident Bidder/Non-Resident Bidder requirement.

b. Each bidder submitting a bid shall execute and include with the bid, a Bidder Status Form in the form herein provided.

c. Failure to submit a fully completed Bidder Status Form with the bid may result in the bid being deemed nonresponsive and rejected.

END OF SECTION

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FORM OF BID OR PROPOSAL
NEW CITY HALL - POLICE HEADQUARTERS
Contract No. 1154
CITY OF WATERLOO, IOWA

Honorable Mayor and City Council

Waterloo, Iowa

1. The undersigned, being a Corporation existing under the laws of the State of ____, a Partnership consisting of the following partners: _____
, having familiarized (himself) (themselves) (itself) with the existing conditions on the project area affecting the cost of the work, and with all the contract documents listed in the Table of Contents and Addenda (if any), as prepared by INVISION and now on file in the office of the City Clerk, City Hall, Waterloo, Iowa, hereby proposes to furnish all supervision, technical personnel, labor, materials, machinery, tools, appurtenances, equipment, and services, including utility and transportation services required to construct and complete this **F.Y. 2026 NEW CITY HALL - POLICE HEADQUARTERS, Contract No. 1154,** all in accordance with the above-listed documents and for the bid and alternates.

BASE BID

a) Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by INVISION for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Base Bid listed in this bid form of:

b) _____
_____ dollars
($_____), in lawful money of the United States of America.

c) We have included the required security deposit as required by the Instruction to Bidders.

CONTRACT TIME

a) Base Bid Scope Substantial Completion: October 29, 2027, or earlier. *(This date will remain unchanged regardless of acceptance of Alternate No. 1)*.

b) With the acceptance of Alternate No. 1: Storm Shelter Addition Substantial Completion, December 31, 2027, or earlier.

ALLOWANCES – SEE SECTION 01 21 00

a) Construction contingencies have been established for this project and are to be included in the bid amount as an allowance.

ALLOWANCE #1: Include in the bid amount a cash allowance of $40,000 for design, procurement, fabrication and installation of Vinyl Wall Graphics noted to be used by allowance.

ALLOWANCE #2: Include in the bid amount a cash allowance of $240,000 for General Construction changes.

UNIT PRICES – SEE SECTION 01 22 00

a) Provide the following unit costs if additions to, or deductions from, work are required and authorized in writing by the Architect/Engineer:

Additional length of drilled pier ($_____/per cubic yard).

Subtracted length of drilled pier (($_____/per cubic yard).

Soil excavation (($_____/per cubic yard).

Rock excavation (($_____/hr).

Removal of obstructions (($_____/hr).

ALTERNATES – SEE SECTION 01 23 00

ALTERNATE 1: STORM SHELTER ADDITION

ADD_____ dollars
($_____), in lawful money of the United States of America.

b) **ALTERNATE 2: BULLET RESISTANT PUBLIC CORRIDOR WALLS AND DOORS**

ADD_____ dollars
($_____), in lawful money of the United States of America.

c) ALTERNATE 3: BULLET RESISTANT EXTERIOR WINDOWS AND DOORS

ADD_____ dollars
($_____), in lawful money of the United States of America.

2. It is understood that the quantities set forth are approximate only and subject to variation and that the unit bid price for the work done shall govern in the actual payment to the Contactor.

3. In submitting this bid, the bidder understands that the right is reserved by the City of Waterloo, Iowa, to reject any or all bids. If written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the undersigned within forty-five (45) days after the opening thereof, or at any time thereafter before this bid is withdrawn, the undersigned agrees to execute and deliver an agreement in the prescribed form and furnish the required bond and certificate of the insurance within ten (10) days after the agreement is presented to him for signature, and start work within ten (10) days after "Notice to Proceed" is issued.

4. Security in the sum of _____

Dollars ($_____) in the form of _____

_____, is submitted herewith in accordance with the INSTRUCTIONS TO BIDDERS.

5. Attached hereto is a Non-Collusion Affidavit of Prime Contractor.

6. Attached hereto is a Resident Bidder Certification.

7. The bidder is prepared to submit a financial and experience statement upon request.

8. The Prime Contractor and Subcontractor(s), which have performed an aggregate of $10,000.00 in work for the City in the current calendar year, are prepared to submit an AAP or Update and an EOC, within ten (10) days of notification that the bid submitted is lowest and acceptable.

9. The bidder has received the following Addendum or Addenda:

Addendum No.	_____	Date	_____
	_____		_____
	_____		_____
	_____		_____

10. The bidder has filled in all blanks on this proposal. Those blanks not applicable are marked "none" or "NA".

11. The bidder has attached all applicable forms.

_____

(Name of Bidder) (Date)

BY:_____ Title:_____

Official Address: (Including Zip Code):

_____

_____

I.R.S. No. _____

INFORMATION NEEDED

FOR

IOWA CONSTRUCTION SALES TAX EXEMPTION CERTIFICATE

CONTRACTOR NAME: _____

ADDRESS: _____

_____

(Check One) PRIME _____ SUBCONTRACTOR _____

FEDERAL ID#: _____

PROJECT NAME: _____

PROJECT CONTRACT NO.: _____

DESCRIPTION OF WORK:

- □ Brickwork
- □ Carpentry
- □ Concrete
- □ Drywall-Plaster-Insulation
- □ Electrical
- □ Excavation/Grading
- □ Flooring
- □ Heavy Construction
- □ Heating-Ventilating-Air Cond.
- □ Landscaping
- □ Painting
- □ Paving
- □ Plumbing
- □ Roofing-Siding-Sheet Metal
- □ Windows
- □ Wrecking-Demolition
- □ Other (Please specify) _____

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NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)
)ss
County of _____)

_____, being first duly sworn, deposes and says that:

1. He is _____(Owner, Partner, Officer, Representative, or Agent)__, of _____ _____, the Bidder that has submitted the attached Bid;

2. He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

3. Such Bid is genuine and is not a collusive or sham Bid;

4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly, with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or, to fix any overhead, profit or cost element of the bid price or the bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the City of Waterloo, Iowa, or any person interested in the Proposed Contract; and

5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

_____
Title

Subscribed and sworn to before me this _____ day of_____, 201__.

_____
Title

My commission expires _____.

NON-COLLUSION AFFIDAVIT OF SUBCONTRACTOR

State of _____)
) ss:
County of _____)

_____, being first duly sworn, deposes and says that:

1. He is _____(Owner, Partner, Officer, Representative, or Agent)_____, of _____ _____ hereinafter referred to as the "Subcontractor;"

2. He is fully informed respecting the preparation and contents of the subcontractor's proposal submitted by the subcontractor to _____, contract pertaining to the _____ _____ project in _____;
(City or County and State)

3. Such subcontractor's proposal is genuine and is not a collusive or sham proposal;

4. Neither the subcontractor nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other bidder, firm or person to submit a collusive or sham proposal in connection with such contract or to refrain from submitting a proposal in connection with such contract, or has in any manner, directly or indirectly, sought by unlawful agreement or connivance with any other bidder, firm or person to fix the price or prices in said subcontractor's proposal, or to fix any overhead, profit or cost element of the price of prices in said subcontractor's proposal, or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Waterloo, Iowa, or any person interested in the proposed contract; and

5. The price or prices quoted in the subcontractor's proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed)_____

_____
Title

Subscribed and sworn to before me this _____day of _____, 201___.

_____
Title

My commission expires _____.

FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____

as Principal, and _____

as Surety are held and firmly bound unto the CITY OF WATERLOO, Iowa, hereinafter called

"OWNER." In the penal sum _____

Dollars ($_____) lawful money of the United States, for the payment

of which sum will and truly be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents. The condition of this obligation is such that whereas the Principal has submitted the accompanying bid dated the _____ day of _____, 20____, for _____ _____.

NOW, THEREFORE,

(a) If said Bid shall be rejected, or in the alternate,

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the form specified and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

By virtue of statutory authority, the full amount of this bid bond shall be forfeited to the Owner in liquidation of damages sustained in the event that the Principal fails to execute the contract and provide the bond as provided in the specifications or by law.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid or execute such contract; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety, have hereunto set their hands and seals, and such of them as are corporations, have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers this _____ day of _____, A.D. 2026.

_____(Seal)
Principal

By _____(Title)

_____ _____(Seal)
Witness Surety

_____ By _____
Witness Attorney-in-fact

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EQUAL OPPORTUNITY CLAUSE

(As provided in Executive Order No. 11246)

All contractors, subcontractors, vendors and suppliers of goods and services doing business with the City and value of said business equals or exceeds ten thousand dollars ($10,000.00) annually agree as follows:

1. The contractors, subcontractor, vendor and supplier of goods and services will not discriminate against any employee or applicant for employment because of race, color, creed, sex, national origin, economic status, age, mental or physical handicap, political opinions or affiliations. The contractor, subcontractor, vendor and supplier will develop an Affirmative Action program to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, color, sex, national origin, religion, economic status, age, mental or physical disability, political opinions or affiliations. Such actions shall include but not be limited to the following:

    a. Employment
    b. Upgrading
    c. Demotion or Transfer
    d. Recruitment and Advertising
    e. Layoff or Termination
    f. Rates of Pay or Other Forms of Compensation
    g. Selection for Training Including Apprenticeship

2. The contractor, subcontractor, vendor and supplier of goods and services will, in all solicitations or advertisements for employees, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, national origin, religion, economic status, age, mental or physical disabilities, political opinion or affiliations.

3. The contractor, subcontractor, vendor and supplier or his/her collective bargaining representative will send to each labor union or representative of workers which he/she has a collective bargaining agreement or other contract or understanding, a notice advising said labor union or workers' representative of the contractor's commitment under this section.

4. The contractor, subcontractor, vendor and supplier of goods and services will comply with all published rules, regulations, directives, and order of the City of Waterloo Affirmative Action Program Contract Compliance Provisions.

5. The contractor, subcontractor, vendor and supplier of goods and services will furnish and file compliance reports within such time and upon such forms as provided by the Affirmative Action Officer. Said forms will elicit information as to the policies, procedures, patterns, and practices of each subcontractor as well as the contractor himself/herself and said contractor, subcontractor, vendor and supplier will permit access to his/her employment books, records and accounts to the City's Affirmative Action Officer, for the purpose of investigation to ascertain compliance with this contract and with rules and regulations of the City's Affirmative Action Program—Contract Compliance Provisions relative to Resolution No. 24664.

6. In the event of the contractor's non-compliance with the non-discrimination clauses of this contract or with any of such rules, regulations and orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further contracts in accordance with procedures authorized by the City Council.

7. The contractor, subcontractor, vendor and supplier of goods and services will include, or incorporate by reference, the provisions of the non-discrimination clause in every contract, subcontract or purchase order unless exempted by the rules, regulations or orders of the City's Affirmative Action Program, and will provide in every subcontract, or purchase order that said provisions will be binding upon each contractor, subcontractor, or supplier.

8. We, the undersigned, recognize that we are morally and legally committed to non-discrimination in employment. Any person who applies for employment with our company will not be discriminated against because of race, creed, color, sex, national origin, economic status, age, mental or physical disabilities.

(Signed) _____
(Appropriate Official)

_____
(Title)

_____
(Date)

STATEMENT OF BIDDER'S QUALIFICATIONS

(To be submitted by the Bidder only upon the specific request of the City of Waterloo, Iowa.)

All questions must be answered and the date given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of bidder.

2. Permanent main office address.

3. When organized.

4. If a corporation, when incorporated.

5. How many years have you been engaged in the contracting business under your present firm or trade name?

6. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)

7. General character of work performed by your company.

8. Have you ever failed to complete any work awarded to you? If so, where and why?

9. Have you ever defaulted on a contract? If so, where and why?

10. List the more important projects recently completed by your company, stating the approximate cost for each, an the month and year completed.

11. List your major equipment available for this contract.

12. Experience in construction work similar in importance to this project.

13. Background and experience of the principal members of your organization, including the officers.

14. Credit available: $ _____.

15. Give bank reference: _____.

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the City of Waterloo, Iowa? _____

17. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the City of Waterloo, Iowa, in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at _____, this _____ day of _____, 200__.

_____
(Name of Bidder)

By: _____
Title: _____

State of _____)
) ss:
County of _____)

_____, being duly sworn deposes and says that he is
_____ of
_____ and that the answers
(Name of Organization)
to the foregoing questions and all statements therein contained are true and correct.

_____

Subscribed and sworn to before me this _____ day of _____, 200___.

_____
Notary Public

My commission expires _____, _____.

FORM OF PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called Principal,
(Corporation, Partnership or Individual)

and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

_____
(Name of Owner)

_____
(Address of Owner)

herein after called OWNER, in the penal sum of _____ Dollars, $(_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.
THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____
20___, a copy of which is hereto attached and made a part hereof for the construction of:

_____

_____

_____

_____

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS HEREOF, this instrument is executed in _____ counterparts, each one of
(number)

which shall be deemed an original, this the _____ day of _____
20_____.

ATTEST:

_____
Principal

_____
(Principal) Secretary

(SEAL) By _____(s)

_____
(Address)

_____

_____
Witness as to Principal

_____
(Address)

_____ _____
Surety

ATTEST: By _____
Attorney-in-Fact

_____ _____
Witness as to Surety (Address)

_____ _____
(Address)

_____

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR is Partnership, all partners should execute BOND.

FORM OF PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, of _____ (hereinafter called the Principal), and _____ of _____ _____(hereinafter called the Surety), are held and firmly bound unto the City of Waterloo (hereinafter called the Obligee), in the penal sum _____ ***Dollars ($)***, lawful money of the United States, to payment of which sum, well and truly to be made, the Principal here firmly binds himself/themselves, his/their heirs, executors, and administrators, and the said Surety binds himself, his successors, assigns, executors, and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that,

WHEREAS the above bounden Principal did, on the ___ day of _____, 20__, enter into a written contract with the City of Waterloo, Iowa, for the construction of _ , a copy of which contract, together with all of its terms, covenants, conditions, and stipulations, is incorporated herein and made a part hereof as full and completely as if said contract were recited at length herein; and

WHEREAS, the Principal and Surety on this bond hereby agree to pay to all persons, firms or corporations having contracts directly with the Principal or with subcontractors, all just claims due them for labor performed or materials furnished in the performance of the contract on account of which bond is given when the same are not satisfied out of the portion of the contract price which the public corporation is required to retain until completion of the public improvement, but the Principal and Surety shall not be liable to said persons, firms, or corporation unless the claims of said claimants against said portion of the contract price shall have been established as provided by law.

Now, if the Principal shall in all respects fulfill his said contract according to the terms and tenor thereof, and shall satisfy all claims and demands incurred for the same, and shall fully indemnify and save harmless the Obligee from all costs and damages which it may suffer by reason of failure to do so, and shall fully reimburse and repay the Obligee all outlays and expenses which it may incur in making good any such default, then the obligation is to be void and of no effect, otherwise to remain in full force and effect.

Every Surety on this bond shall be deemed and held, any contract to the contrary notwithstanding, to consent without notice:

1. To any extension of time to the contract in which to perform the contract.

2. To any change in the plans, specifications, or contract when such change does not involve an increase of more than twenty percent (20%) of the total contract price, and shall then be released only as to such excess increase.

3. That no provision of this bond or of any other contract shall be valid which limits to less than one (1) year from the time of the acceptance of the work the right to sue on this bond for defect in workmanship or material not discovered or known to the Obligee at the time such work was accepted.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this ___ day of _____, 20__.

Principal _____

By: _____

Surety _____

_____
Attorney-in-Fact

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Bidder Status Form

To be completed by all bidders — Part A

Please answer "Yes" or "No" for each of the following:

☐ Yes ☐ No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).

☐ Yes ☐ No My company has an office to transact business in Iowa.

☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.

☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.

☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders — Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____ /_____ /_____ to _____ /_____ /_____ Address: _____

City, State, Zip: _____

Dates: _____ /_____ /_____ to _____ /_____ /_____ Address: _____

City, State, Zip: _____

Dates: _____ /_____ /_____ to _____ /_____ /_____ Address: _____

You may attach additional sheet(s) if needed. City, State, Zip: _____

To be completed by non-resident bidders — Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

_____

2. Does your company's home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers? ☐ Yes ☐ No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

_____

_____

You may attach additional sheet(s) if needed.

To be completed by all bidders — Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156. This form has been approved by the Iowa Labor Commissioner.

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.

☐ Yes ☐ No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.

☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.

☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.

☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.

☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.

☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.

☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.

☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.

☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.

☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

Low Bidder to submit form with 24 HR information.

GENERAL SPECIFICATIONS FOR CONSTRUCTION

CITY OF WATERLOO, IOWA
Department of Engineering

SECTION A - Definitions of Terms
SECTION B - Scope of work
SECTION C - Control of Materials and Work
SECTION D - Procedure and Progress
SECTION E - Measurements and Payments
SECTION F - Legal Relations and Responsibility

SECTION A - DEFINITIONS OF TERMS

1. **CITY**. The City of Waterloo, Iowa, which is the Party of the First Part of the accompanying contract, acting through its authorized representative.

2. **COUNCIL**. The duly elected Council of the City of Waterloo, Iowa.

3. **BUILDING OFFICIAL**. The City Building Official of Waterloo, Iowa, or his authorized representative.

4. **INSPECTOR**. The authorized representative of the Building Official, assigned to the detailed inspection of the work or materials therefor and to such other duties as may be delegated to him in these specifications.

5. **CONTRACTOR**. The Party of the Second Part in the accompanying contract for the improvement covered by these specifications, or his authorized representative.

6. **SUBCONTRACTOR**. Any person, firm, or corporation who has, with the approval of the Council, contracted with the Contractor to execute and perform in his stead all or any part of the contract.

7. **BIDDER**. Any individual, firm, or corporation submitting a proposal for all or a part of the work provided for in these specifications.

8. **PROPOSAL GUARANTEE**. The security designed in the Notice of Bidders or Proposal to be furnished by the bidder as a guarantee of good faith to enter into a contract and furnish an acceptable bond for the work contemplated if it be awarded him.

9. **SURETY**. The corporate body bound with and for the Contractor for the acceptable performance of the contract.

10. **PROPOSAL**. The written Proposal, submitted by the bidder in the prescribed manner and on the standard form, for the improvements covered by these specifications.

11. **SPECIFICATIONS**. The documents that set forth the manner in which the proposed work is to be accomplished which have been prepared by the Building Official and approved by the City Council, official copies of which are now on file with the City Clerk.

12. **SPECIAL PROVISIONS**. Clauses or memoranda not contained herein, applying to the contract of which these specifications are a part, which change or supplement these specifications.

13. **CONTRACT**. The agreement entered into between the City and the Contractor, setting forth the terms under which the work covered by the plans and specifications is to be performed. The contract includes all conditions, definitions, and instructions set forth in the official publications relating to the work, the official contract and specifications, the Proposal, official plans, and all supplemental agreements entered into by the parties to the contract.

14. **NOTICE TO BIDDERS**. The notice called attention of bidders to the time and place for receiving bids, containing a brief description of the work, and briefly setting forth the requirements and conditions for submission of Proposals.

15. **INSTRUCTIONS TO BIDDERS**. The clauses setting forth in detail the information relative to the proposed work and requirements for the submission of Proposals.

16. **PLANS**. The plans for the improvement covered by the specifications and approved by the Council, official copies of which are on file with the City Clerk.

17. **CONTRACT BOND**. The bond executed by the Contractor and his surety in favor of the City of Waterloo, Iowa, guaranteeing the complete execution of the contract in accordance with the plans and specifications, the payment of all debts pertaining to the work, and maintenance of the work as provided by law or by the specifications.

18. **CONTRACT PERIOD**. The period from the specified date for beginning the work to the specified date of completion, both dates inclusive. The contract period may be extended by the Council, as provided in these specifications, in which event the contract period includes the new date of completion.

19. **OFFICIAL PUBLICATIONS**. The official publications are the formal resolutions and notices relative to the proposed improvement that are required by law to be published in a prescribed manner and that have actually been published in accordance with the statutes relating thereto. Attention is directed to the fact that these official publications are by statute vested with all of the force and effect of contract obligations.

20. **A.S.T.M.** Abbreviation for American Society for Testing Materials.

21. **WORK**. The term "Work" of the Contractor and Subcontractor includes labor or materials or both, equipment, transportation, or other facilities necessary to complete the contract.

22. **TIME**. All time limits stated in the contract documents are of the essence in the contract.

SECTION B - SCOPE OF WORK

1. **CORRELATION AND INTENT OF DOCUMENTS**. The Contract documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the documents is to include all labor, materials, equipment, and transportation necessary for the proper execution of the work. Materials or work described in words which, so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standard.

2. **DRAWINGS AND SPECIFICATIONS**. Unless otherwise provided in the contract documents, the Building Official shall furnish to the Contractor, free of charge, all copies of drawings and specifications reasonably necessary for the execution of the work.

The Contractor shall keep one (1) copy of all drawings and specifications on the work available to the Building Official and to his representatives.

3. **CONTRACTOR'S UNDERSTANDING**. It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature, character and location of the work, the conformance to the ground, the character, quality, and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can, in any way, affect the work under this contract. No verbal agreement or conversation with any officer, agent, or employee of the City, either before or

after the execution of the Contract, shall affect or modify any of the terms or obligations herein contained.

4. **REPORTING ERRORS AND DISCREPANCIES**. If the Contractor, in the course of the work, finds any discrepancies between the plans and the physical conditions of the locality, or any errors of omission in plans or in the layout as given by said stakes and instructions, it shall be his duty to inform the Building Official immediately, in writing, and the Building Official shall promptly correct the same.

5. **ALTERATION OR CORRECTION OF PLANS**. The plans are made up from surveys that are presumably correct and represent the foreseen construction requirements. Any modification of the plans which may be required by the exigencies of the construction or any corrections made necessary because of errors in the original surveys, will be made by the Building Official. Should corrections or modifications of the plans or specifications require a different quality or class of work than that upon which the unit prices in the Proposal are based, or if the modifications or corrections are required in parts of the work partially completed and such modifications result in an increased cost to the Contractor, the amount to be paid for work resulting from such changes shall be agreed upon in writing at the time the changes are ordered and before the work is begun by the Contractor. No allowance will be made for anticipated profits on work not performed.

6. **CHANGES IN THE WORK**. The City, without invalidating the contract, may order extra work or make changes by altering, adding to, or deducting from the work, the contract sum being adjusted by agreement or arbitration before such changed work is undertaken. All such work shall be executed under the conditions of the original contract, except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.

7. **INCREASED OR DECREASED QUANTITIES**. The right is reserved without impairing the contract, to order the performance of such work of a class not contemplated in the Proposal or to increase or decrease the quantities as may be considered necessary to complete fully and satisfactorily the work included in the contract. However, when the work is completed without change in the plans, and the measured quantity of any item of work varies by more than twenty percent (20%) from the estimated quantity specified in the contract, an adjustment in price may be made for such item of work by agreement between the Building Official and the Contractor, subject to the approval of the City Council. Either party to the contract may request such an adjustment.

8. **LANDS AND RIGHT OF WAY.** The City shall provide the lands upon which the work under this contract is to be done, except that the Contractor shall provide land required for the erection of temporary construction facilities and storage of his material, together with the right of access to same.

9. **CITY WATER**. The Contractor shall be allowed to use City Water but before any water is used, he shall make application to the Waterloo Water Works for a temporary water connection from a fire hydrant or by some other connection method. Water usage will be charged at the rate for temporary water service. The rules, regulations, and water rates are available at the Waterloo Water Works offices at 325 Sycamore Street or their telephone number is 319-232-6280.

10. **RIGHTS OF VARIOUS INTERESTS**. Whenever work being done by the City's forces or by other Contractors is contiguous to work covered by this contract, the respective rights of the various interests involved shall be established by the Building Official to secure the completion of the various portions of the work in general harmony.

11. **CLOSING STREETS TO TRAFFIC**. The Building Official shall be the judge of how many streets or parts of streets it is necessary for the Contractor to close at any time and may refuse to permit the closing of additional streets until such of the work is finished and opened to traffic as he may direct.

12. **OBSTRUCTION OF STREETS**. The work is to be carried on in such manner as to obstruct the streets, highways, and alleys as little as possible. The Contractor shall carry on the different parts of the work so as to complete the whole, as nearly as practicable, at the same time. In doing the work, the Contractor shall follow the directions of the Building Official as to the place or places where work shall be started or be carried on and the direction in which it shall be done.

13. **SHANTIES AND BUILDINGS**. Shanties or other buildings shall not be erected in or upon any street, highway, or alley without permission of the Building Official. If such permission be granted, it may be upon any reasonable terms prescribed by the person or body granting such permission.

14. **SANITARY CONVENIENCES**. The Contractor shall furnish the necessary sanitary conveniences, properly secluded, for the laborers on the work, and these shall be maintained in a manner that will be inoffensive to the public.

15. **CLEANING UP**. The Contractor shall, as directed by the Building Official, remove from the City's property and from all public and private property, at his own expense, all temporary structures, rubbish, and waste materials resulting from his operations before work can be considered completed. The Contractor shall also renew or replace any and all fences, sidewalks, or other property damaged or disturbed by his work.

16. **OMISSION OF PARTS OF GENERAL SPECIFICATIONS**. Parts of the General Specifications deemed not to apply to some particular work may be omitted by special reference in other parts of the contract documents.

SECTION C - CONTROL OF MATERIALS AND WORK

1. **SUPERVISION AND INSPECTION.** The Building Official shall have supervision of the construction provided for in this Contract and shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress on the work, and all questions regarding the acceptable fulfillment of the terms of the Contract. Materials and construction work shall, at all times, be subject to the inspection of the Building Official or his representatives. The Contractor shall be held strictly to the true intent of these specifications as regards the quality of materials, workmanship, and the diligent prosecution of the work.

The Building Official and his representatives shall, at all times, have access to the work wherever it is in preparation of progress, and the Contractor shall provide proper facilities for such access and for inspection.

If the specifications, the Building Official's instructions, law ordinances, or any public authority require any work and/or materials to be especially tested or approved, the Contractor shall give the Building Official timely notice of readiness for inspection. If the inspection is to be made by authority other than the Building Official, the Contractor shall notify the Building Official of the date fixed for inspection. Inspections by the Building Official will be promptly made and, where practicable, at the source of supply. If any work should be covered up without the approval or consent of the Building Official, it must, if required by the Building Official, be uncovered for examination at the Contractor's expense.

Re-examination of questioned work may be ordered by the Building Official, and, if so ordered, the work must be uncovered by the Contractor. If such work be found in accordance with the Contract, the City shall pay the cost of re-examination and replacement. If such work be found not in accordance with the Contract, the Contractor shall pay such cost unless he shall show that the defect in the work was caused by another Contractor, and, in that event, the City shall pay the cost.

2. **AUTHORITIES AND DUTIES OF INSPECTORS**. Inspectors may be stationed on the work to report to the Building Official as to the progress of the work and the manner in which it is being performed; also, to report whenever it appears that materials furnished and work performed by the Contractor fail to fulfill the requirements of the specifications and Contract, and to direct the attention of the Contractor to such failure or infringement; but such inspection shall not relieve the Contractor from any obligations to furnish acceptable materials or to provide completed construction that is satisfactory in every particular.

In case of any dispute arising between the Inspector and the Contractor as to materials furnished or the manner of performing the work, the Inspector shall have the authority to reject materials or suspend the work until the question at issue can be referred to and decided by the Building Official. Inspectors are not authorized to revoke, alter, enlarge, relax, or release any requirements of these specifications. The Inspector shall, in no case, act as foreman or perform other duties for the Contractor, or interfere with the management of the work by the latter.

3. **STATUS OF THE BUILDING OFFICIAL**. The Building Official shall have general supervision and direction of the work. He has authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract. He shall also have authority to reject any work and/or materials which do not conform to the specifications, to direct the application of forces to any portion of the work as, in his judgment, is required, and to order the force increased or diminished, and to decide questions which arise in the execution of the work.

4. **BUILDING OFFICIAL'S DECISIONS.** The Building Official shall, within a reasonable time, make decisions on all claims of the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

All such decisions of the Building Official shall be final except as to the element of time and financial consideration involved, which, if no agreement in regard thereto is reached, shall be subject to arbitration.

5. **STAKES AND INSTRUCTIONS**. The Contractor shall provide reasonable and necessary opportunities and facilities for setting stakes and making measurements. The Contractor shall not furnish stakes or men to set them. He shall not proceed until he has received from the Building Official such stakes and instructions as may be necessary to the progress of the work.

The Contractor shall carefully preserve bench marks, reference points, and stakes, and in case of willful or careless destruction, he shall be charged with the resulting extra expense and shall be responsible for any mistakes that may be caused, by their loss or disturbance.

6. **SUPERINTENDENCE.** The Contractor shall keep on his work during its progress a competent superintendent and any necessary assistants, all satisfactory to the Building Official. The Superintendent shall not be changed except with the consent of the Building Official, unless the Superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The

Superintendent shall represent the Contractor in his absence, and all directions given to him shall be as binding as if given to the Contractor. Important decisions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

The Contractor shall give efficient supervision to the work using his best skill and attention. He shall carefully study and compare all drawings, specifications, and other instructions, and shall report at once to the Building Official any error, inconsistency, or omission which he may discover.

7. **REMOVAL OF UNAUTHORIZED WORK**. Work done without lines and grade being give, work done beyond lines shown on the plans or as given, except as herein provided, or any extra or additional work done without authority, will be considered as unauthorized and at the expense of the Contractor and will not be paid for under the provisions of the Contract. Work so done may be ordered removed and replaced at the Contractor's expense.

8. **REMOVAL OF DEFECTIVE MATERIALS OR WORK**. The Contractor shall promptly remove from the premises all materials condemned by the Building Official as failing to conform to the Contract; whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the contract and without expense to the City, and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work and materials within a reasonable time, fixed by written notice, the City may remove them and may store the material at the expense of the Contractor. If the Contractor does not pay the expense of such removal within a reasonable time thereafter, the City may, upon ten (10) days' written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expense that should have been borne by the Contractor; or, if the net proceeds of such sale are insufficient to pay the expenses of removal, the City may deduct the balance from any amounts due the Contractor.

9. **MATERIALS, EQUIPMENT, APPLIANCES, AND FACILITIES**. Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work. Materials shall be of the quality specified for each particular part of the work.

Whenever, in construction of the work or in the manufacture of any article of appliance necessary for the construction or operation of the work, it is necessary to use any material that is not fully specified in these specifications, it shall be of good quality and shall meet with the approval of the Building Official.

Any appliance that is necessary for the construction or operation of the work and is commonly recognized as a part of the work, shall be furnished by the Contractor as part of the work, whether or not it is specifically called for in the plans and specifications, and such appliance shall be of good quality and standard make and shall meet with the approval of the Building Official.

10. **MATERIAL SAMPLES**. Before the contract is awarded, the bidder may be required to furnish a statement of the origin, composition, and manufacture of any and all materials proposed for use in the performance of the Contract, together with samples of the material. These samples will be considered as representative and typical of the material to be obtained from any particular source.

11. **CHARACTER OF WORKMEN AND EQUIPMENT**. The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work who shall refuse or neglect to obey the directions of the Building Official or Inspector, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Building Official so orders, and shall not be re-employed unless express permission be given by the Building Official. The Contractor shall, at all times, enforce discipline and good order among his employees.

The methods, equipment, and appliances used on the work, and the labor employed, shall be such as will produce a satisfactory quality of work and shall be adequate to complete the contract within the specified time limit.

12. **HIRING CITY EMPLOYEES**. The Contractor shall not employ and hire any of the City's employees without the permission of the Building Official.

13. **LABOR.** Local labor shall be given preferences so far as practicable.

14. **THE CITY'S RIGHT TO DO WORK**. If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City of Waterloo, after three (3) days' written notice to the Contractor may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor, provided, however, that the Building Official shall approve both such action and the amount charged to the Contractor.

SECTION D - PROCEDURE AND PROGRESS

1. **ORDER OF COMPLETION - USE OF COMPLETED PORTIONS**. The Contractor shall complete any portion or portions of the work in such order or time as the Building Official may require. The City shall have the right to take possession of an use completed or partially completed portion of the work at any time, but such taking possession and use shall not be deemed an acceptance of work so taken or used, or any part thereof. If such prior use increases the cost of or delays the work, the Contractor shall be entitled to such extra compensation or extension of time, or both, as the Building Official may determine.

2. **WEATHER**. During stormy or inclement weather, all work shall be suspended, except such as can be done in an acceptable manner. Permission to work during freezing, stormy, or inclement weather shall in no way be construed as a release of the Contractor's responsibility regarding the quality of the finished work at such time.

3. **SUNDAYS AND LEGAL HOLIDAYS**. Except for such work as may be required to properly maintain or protect completed or partially completed construction or to maintain lights and barricades, no work will be permitted on Sundays or legal holidays without specific permission of the Building Official.

4. **DELAYS AND EXTENSION OF TIME.** If the Contractor be delayed in the completion of the work by an act of neglect of the City, or its employees; or by any other Contractor employed by the City; or by changes ordered in the work; or by strikes, lockouts, fire, unusual delays in transportation, unavoidable casualties, or any cause beyond the Contractor's control; or by delay authorized by the Building Official pending arbitration; or by any cause which the Building Official shall decide justifies the delay, then the time of completion shall be extended for such reasonable time as the Building Official may decide will compensate for such delay.

No such extension shall be made for delay occurring more than thirty (30) days before claim therefor is made in writing to the Building Official. In the case of a continuing cause of delay, only one claim is necessary.

This article does not exclude the recovery of damages for delay by either party under provisions in the contract documents.

5. **TEMPORARY SUSPENSION OF WORK**. The Building Official shall have authority to suspend the work, wholly or in part, for such period or periods of time as he may deem necessary, due to unsuitable weather or such other conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as is necessary due to the failure to the Contractor to carry out orders given or to perform any or all provisions of the Contract.

6. **NOTICES - HOW SERVED**. Any notice to be given by the City to the Contractor under this contract shall be deemed to be served if the same be delivered to the man in charge of any office used by the Contractor or his foreman or agent at or near the work, or deposited in the post office, postpaid, addressed to the Contractor at his last known place of business.

7. **PROGRESS OF WORK**. The progress of the work shall be such that, at the expiration of one-fourth (1/4) of the contract period, one-eighth (1/8) of the work shall be completed; at the expiration of one-half (1/2) of the contract period, three-eighths (3/8) of the work shall be completed; at the expiration of three-fourths (3/4) of the contract period, the work shall be three-fourths (3/4) completed, and the whole work shall be completed at the expiration of the contract period.

If, at any time the above schedule is not being maintained, the Council may give written notice to the Contractor and his sureties that the specifications are not being complied with. Such notice shall state what action on the part of the Contractor is required to bring the work within the requirements of the specifications. If the Contractor fails, within ten (10) days, to proceed as directed in the said notice, then the Council shall have authority to annul this contract without process or action at law and take over the prosecution and completion of the work, as provided under the article covering City's right to terminate contract.

8. **CITY'S RIGHT TO TERMINATE CONTRACT**. If the Contractor should be adjudged a bankrupt; or if he should make a general assignment for the benefit of this creditor; or if a Receiver should be appointed on account of his insolvency; or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough skilled workmen or proper materials; or if he should fail to make prompt payment to Subcontractors or for materials or labor; or if he should persistently disregard laws, ordinances, or the instructions of the Building Official; or if he should otherwise be guilty of a substantial violation of any provision of the contract, then the City, upon the certificate of the Building Official that sufficient cause exists to justify such action, may, without prejudice to any other rights or remedy, and after giving the Contractor seven (7) days' written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method he may deem expedient. In such cases, the Contractor shall not be entitled to receive any further payment until the work is finished.

If the unpaid balance of the contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administration services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the City. The expense incurred by the City as herein provided and the damage incurred through the Contractor's default shall be certified by the Building Official.

9. **REMOVAL OF EQUIPMENT**. In the case of annulment of this contract before completion, from any cause whatsoever, the Contractor, if notified to do so by the City; shall promptly remove any part or all of his equipment and supplies from the property of the City, failing which, the City shall have the right to remove such equipment and supplies at the expense of the Contractor.

SECTION E - MEASUREMENTS AND PAYMENT

1. **STANDARD OF MEASUREMENT**. All work completed under the contract shall be measured by the Building Official according to the United States standard measures.

2. **SCOPE OF PAYMENTS**. The Building Official's measurements of quantities shall be the basis for final payment for the work performed under this Contract. After the work is completed, the Building Official will make measurements and computations of the number of units of each of the various items of work completed, and the Contractor will be paid for the actual amount of work performed at the rates specified in his Proposal. Before final settlement is made, the Council may require the Contractor to submit a list of all persons furnishing labor or materials, with evidence that such persons have been paid in full. Payment shall be made in the manner set forth in official publications and Council Proceedings relative thereto.

3. **PAYMENT FOR EXTRA WORK**. Such extra work as may have been ordered by the Building Official and performed by the Contractor shall be compensated for as provided herein. If work is to be done or materials are to be furnished by the Contractor which cannot properly be classified under unit prices included in the Proposal, the Contractor shall be paid therefor the actual reasonable cost of the labor and materials entering permanently in such work, plus fifteen percent (15%) of the cost thereof. In computing the labor cost on such extra work, the following items shall be included:

(a) Actual payroll expenditures for labor at the current rate therefor, and cost of materials.

(b) Pay of foreman and timekeepers for actual time required on the extra work.

(c) Liability insurance, prorated, for the extra work.

Labor cost items on extra work shall be furnished in duplicate by the Contractor to the Inspector daily. The Inspector shall check the items, and if he finds them to be correct, he shall so certify on the statement of cost, returning one copy to the Contractor and filing one copy with the Building Official.

The Building Official shall determine the cost of materials entering into extra work from the materials and receipted freight bills for the same.

For any special machine, power tools, or equipment, including fuel and lubricants, but not including small hand tools, which may be deemed necessary or desirable to use, the Contractor shall be allowed a reasonable rental thereon, to be agreed upon in writing by the Building Official before such work is begun, and to which sum no percentage is to be added.

The item of cost shall not include repairs or replacement of equipment or overhead expenses of any character. The fifteen percent (15%) allowed is considered to cover the use of hand tools and all overhead expenses except liability insurance.

In no case will a claim for extra compensation be allowed unless the work upon which the claim is based has been ordered in writing, except as provided hereinafter.

4. **CLAIMS FOR EXTRA COST**. If the Contractor claims that any instructions, by drawings or otherwise, involved extra cost under this contract, he shall give the Building Official written notice thereof within ten (10) days after completion of the work.

No such claim shall be valid unless so made.

5. **CLAIMS FOR EXTRA COMPENSATION**. If the Contractor deems that extra compensation is due him for work and/or materials that he considered is not clearly covered in the items for which he submitted unit prices in his bid and that were not ordered in writing by the Building Official as an extra s heretofore provided, the Contractor shall notify the Building Official, in writing, of his intention to make claim for extra compensation for work and/or material before starting construction. If such written notification is not given or the Building Official is not afforded proper facilities by the Contractor for keeping strict account of actual cost as defined herein, then the Contractor hereby agrees to waive the claim for extra compensation. Such notice to the Building Official and the fact that the Building Official has kept account of cost as aforesaid, shall not in any way be construed as proving the validity of the claim, which must be passed upon by the Council. In the event that the Council finds the claim to be just, it shall be allowed and paid for as extra work as provided herein.

6. **COMPLETION REPORT AND OBJECTIONS THERETO**. Within ten (10) days after the full completion of the work to be done under this contract, the Building Official shall make a written statement of all the work done by the Contractor hereunder, stating the quantity of each item as found by him and including a statement of all credits for extra work and all credits or debits for changes, alterations, omissions, and defects, and shall forthwith deliver a copy of such statement to the Contractor. The Contractor shall compare such statement with his own records and shall then, in writing, either approve such statement or point out any claimed errors or omissions. If any of such claims are found correct, the Building Official shall, within ten (10) days, prepare a new statement, a copy of which shall in like manner be delivered unto the Contractor. The Building Official will not file a formal completion report with the City until the Contractor has approved the same.

If the figures of the Building Official and the Contractor cannot be reconciled, or there is a difference of opinion regarding some item or items, then such difference of opinion shall be submitted to arbitration as hereinafter provided, and the decision of the arbitrator or arbitrators shall be final, and the Building Official shall, within a period of five (5) days, file his completion report.

Before action by the City Council upon such completion report, the Contractor shall also file a written statement of any claims he may have against the City, other than those shown by such completion report, growing out of this contract or the work done hereunder. The City shall retain ten percent (10%) of the amount due the Contractor on the completion report for a period of thirty (30) days. If no claims are filed against the Contractor within thirty (30) days, the final ten percent (10%) shall then be paid to the Contractor.

7. **WAIVER**. By the execution of this contract ,the Contractor agrees that any objections he may have to the statement of the amount of work done hereunder included by the Building Official in this completion report, and any claims of the Contractor against the City growing out of this contract and the work done hereunder which are not stated in writing in the manner and within the time provided in Article 6, Section E hereof, shall be waived, and no such claim shall thereafter be asserted against the City.

SECTION F - LEGAL RELATIONS AND RESPONSIBILITIES

1. **LAWS RELATING TO WORK**. The Contractor is presumed to be familiar with all laws, ordinances, and regulations which may, in any manner, affect those engaged or employed upon the work or the materials or equipment used in or upon the work, and shall conduct the work so as not to conflict with such laws, ordinances, and regulations.

2. **PROTECTION OF WORK AND PROPERTY**. The Contractor for any part of the improvement shall be held responsible for the care of materials and of partially completed and completed work until final acceptance of the same by the Council. He will be required to make good at his own expense any damage which the work may sustain from any cause prior to the filing of the Building Official's certificate of completion. He shall take all risk from floods and casualties of every description and make no charge for delay due to such cause. He may, however, be allowed a reasonable extension of time on account of such delays. He shall correct or make good at his own expense all damages to adjacent property due to the acts or negligence of his employees of the prosecution of his work, and save the City harmless therefor.

The Contractor shall be held liable and responsible for all damages done to water, sewer, drain, or other underground pipes and structures, and to sidewalks and private property.

3. **RESPONSIBILITY FOR ACCIDENTS**. The Contractor shall assume full responsibility for all damages sustained by persons or property due to the carrying on of his work until final acceptance thereof, or until released by the Building Official in writing.

4. **LIABILITY INSURANCE**. The Contractor shall carry liability insurance which shall save the City harmless and protect the public and any person from injury sustained by the reason of the prosecution of the work or the handling or storing of materials therefor, and said Contractor shall also carry liability insurance which shall meet the requirements of the Iowa Worker's Compensation Law.

Before work shall be started on this contract, the Contractor shall furnish the City Clerk with proper affidavit or Affidavits executed by representatives of duly qualified insurance companies, evidencing that said insurance company or companies have issued liability insurance policies, effective during the life of the contract, or for a period of a least ten (10) days following the filing of written notice of cancellation, protecting the public and any person from injuries or damages sustained by reason of carrying on the work involved in the Contract. The affidavit shall specifically evidence the following forms of insurance protection:

(a) Public liability insurance covering all operations performed by persons directly employed by the Contractor.

(b) Public liability insurance covering all operations performed by any Subcontractor to whom a portion of the work may have been assigned.

(c) Public liability insurance covering all work upon the project performed by any independent Contractor working under the direction of either the principal Contractor or a Subcontractor.

(d) Motor vehicle bodily injury liability insurance and property damage liability insurance on all motor vehicles employed on the work, whether owned by the Contractor or by other persons, firms, or corporations.

(e) The minimum protection shall be as follows:

Comprehensive General Liability Insurance

General Aggregate Limit	$ 5,000,000.00

Products—Completed Operations Aggregate Limit	$ 5,000,000.00
Each Occurrence Limit	$ 5 ,000,000.00
Comprehensive Automobile Liability Insurance	$ 1,000,000.00

The Contractor shall have the City of Waterloo, Iowa, named as an "Additional Named Insured". A certificate, or a policy if requested, shall be filed with the Owner.

All certificates and/or policies of insurance furnished by the Contractor to be filed with the City Clerk shall include the name and address of the agency issuing the same. It shall also be required that the City Clerk be notified by registered mail of the cancellation or expiration of the above insurance.

5. **BARRICADES AND SIGNS**. The Contractor shall, at his own expense and without further or other order, provide, erect, and maintain, at all times during the progress and suspension of the work and until completion and final acceptance thereof, suitable and requisite barricades, signs, or other adequate protection, as required by the latest edition of the "Iowa Manual on Uniform Traffic Control Devices for Streets and Highways" and shall provide, keep, and maintain such barricades, signs, etc., as may be required or as may be ordered by the City Building Official, to insure the safety of the public as well as those engaged on the work. All barricading plans shall be approved by the City Building Official.

6. **ROYALTIES AND PATENTS**. The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the City harmless from loss on account thereof, except that the City shall be responsible for all such loss when a particular process or the product of a particular manufacturer is specified.

7. **PERMITS AND REGULATIONS**. Permits and licenses of a temporary nature for the prosecution of the work shall be secured and paid for by the Contractor. Permits, license, and easements for permanent changes in existing facilities shall be secured and paid for by the City.

8. **CLAIMS FOR DAMAGES**. Any claim for damages arising under this Contract shall be made in writing to the party liable within a reasonable time of the first observance of such damage and no later than the time of final payment, except as expressly stipulated otherwise in the case of faulty work or materials, and shall be adjusted by agreement or arbitration.

The Contractor shall be held for the payment of all just claims against him arising out of the prosecution of this contract, and his bond will not be released until such claims are paid for dismissed.

9. **ASSIGNMENT OF CONTRACT**. The Contractor shall not sell or assign the contract or sublet any portion of the work provided for therein without the written consent of the City Council.

10. **SUBCONTRACTORS**. The Contractor shall, as soon as practicable after the signature of the contract, notify the Building Official in writing of the names of the Subcontractors proposed for the work and shall not employ any that the Building Official may, within a reasonable time, object to as incompetent or unfit.

The Contractor agrees that he is as fully responsible to the City for the acts and omission of his Subcontractors and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the contract documents shall create any contractual relation between any Subcontractor and the City.

11. **ARBITRATION**. All questions subject to arbitration under this Contract shall be submitted to arbitration at the choice of either party to the dispute.

The Contractor shall not cause a delay of the work during any arbitration proceedings, except by agreement with the Building Official.

The demand for arbitration shall be filed in writing with the Building Official, in the case of an appeal from his decision, within ten (10) days of its receipt, and in any other case, within a reasonable time after cause thereof, and in no case later than the time of final payment, except as otherwise expressly stipulated in the contract. If the Building Official fails to make a decision within a reasonable time, an appeal to arbitration may be taken as if his decision had been rendered against the part appealing.

No one shall be nominated or act as an arbitrator who is in any way financially interested in the contract or in the business affairs of either the City or the Contractor.

The general procedure shall conform to the laws of the State of Iowa. Unless otherwise provided by such laws, the parties may agree upon one arbitrator; otherwise, there shall be three--one named in writing by each party to this contract to the other party, and the third chosen by these two arbitrators, or, if they fail to select a third within ten (10) days, then he shall be chosen by the Comptroller of the State of Iowa. Should either party refuse or neglect to supply the arbitrators with any papers or information demanded in writing, the arbitrators are empowered by both parties to proceed ex parte.

If there be one arbitrator, his decision shall be binding; if three, the decision of any two shall be binding. Such decision shall be a condition precedent to any right of legal action, and, wherever permitted by law, it may be filed in Court to carry it into effect.

The arbitrators, if they deem that the case demands it, are authorized to award to the party whose contention is sustained such sums as they shall deem proper for the time, expense, and trouble incident to the appeal, and, if the appeal was taken without reasonable cause, damages for delay, the arbitrators shall fix their own compensation unless otherwise provided by agreement, and shall assess the costs and charges of the arbitration upon either or both parties.

The award of the arbitrators must be in writing, and it shall not be open to objections on account of the form of proceeding or the award, unless otherwise provided by the laws of Iowa.

In the event of such laws providing on any matter covered by this article otherwise than as hereinbefore specified, the method of procedure throughout and the legal effect of the award shall be wholly in accordance with the laws of the State of Iowa, it being intended hereby to lay down a principle of action to be followed, leaving its local application to be adopted to the legal requirements of the place in which the work is to be done.

12. **PERFORMANCE AND PAYMENT BONDS**. The Contractor shall, at the time of execution and delivery of this contract and before the taking effect of same, furnish and deliver to the City written bonds of indemnity to the amount required by law in form and substance, and with surety thereon satisfactory and acceptable to the City, to insure the faithful performance and payment by the Contractor of all the covenants and agreements on the part of the Contractor contained in this contract. These bonds shall remain in force and effect for the full amount of the Contract.

13. **PERSONAL LIABILITY OF PUBLIC OFFICIALS**. In carrying out any of the provisions of the Contract or in exercising any power or authority granted him thereby, there shall be no liability upon the Building Official or his authorized assistants, either personally or as an official of the City, it being understood that in such matters he acts as the agent and representative of the City.

14. **JURISDICTION**. Any action in Court against the Contractor or sureties on his bond because of damages to property or individuals by said Contractor or his workmen, or because of the violation of any provisions of the specifications, or on account of the failure of said Contractor to comply fully with these provisions, shall be brought in the District Court of the State of Iowa in and for Black Hawk County.

15. **TERMINATION OF RESPONSIBILITY**. The Contract shall be considered as completed and the Contractor released from further obligations except as to the requirements of his bond, after the work has been completed and finally accepted and final estimates have been allowed and the completion report of the Building Official has been filed and approved by the Council.

16. **CITY'S LEGAL RIGHTS**. The City shall not be precluded by any measurements, estimate, or certificate made, either before or after the completion and acceptance of the work and payment therefor, from showing the true amount and character of the work performed and materials furnished by the Contractor, or from showing that any such measurement, estimate, or certificate is untrue or incorrectly made, or the work or materials do not, in fact, conform to the Contract.

The City shall not be precluded, notwithstanding any such measurements, estimate, or certificate and payment in accordance therewith, from recovering from the Contractor and his surety such damages as it may sustain by reason of his failure to comply with the terms of the Contract. Neither the acceptance by the City or any of its representatives, nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, nor any possession taken by the City, shall operate as a waiver on any portion of the contract or of any power herein reserved, or any right to damages herein provided. A waiver of any breach of the contract shall not be held to be a waiver of any other or subsequent breach.

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: 24102 New City Hall - Police Headquarters

B. Owner's Name: City of Waterloo.

C. Design Professional's Name: INVISION Architecture LLC.

D. Mechanical and Electrical Engineer: MODUS Engineering.

E. Structural Engineer: IMEG Corp.

F. This project consists of the renovation of three floors (approximately 48,000 SF) of the existing building at 100 E. 4th St. in Waterloo to serve as Waterloo City Hall and police headquarters. A 900 SF storm shelter will also be included as an alternate bid item.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 50 00 - Contracting Forms and Supplements.

B. Construction Budget: $11,000,000.

C. Construction Commencement: November 2026.

D. Base Bid Scope Substantial Completion: October 29, 2027. *(This date will remain unchanged regardless of acceptance of Alternate No. 1)*

1. Alternate No. 1: Storm Shelter Addition Substantial Completion, December 31, 2027.

1.03 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 41 00.

B. Scope of alterations work is indicated on drawings.

C. Owner will remove the following items before start of work:

1. Owner (by separate contract) will relocate furniture and store on site prior to start of Work.

D. Contractor is required to remove and store the following prior to start of work, for later reinstallation by Contractor:

1. Masonry.
2. ACM / MCM panels.

1.04 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by Owner after Substantial Completion.

1. Furnishings.
2. Small equipment.

1.05 OWNER OCCUPANCY

A. Owner intends to continue to occupy the adjacent parking ramp during the entire construction period. Access must be maintained.

B. Cooperate with Owner to minimize conflict - Building is adjacent to a Public Park. Access to the Park Pathways must be maintained and fenced as necessary for Public Safety.

C. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Arrange use of site and premises to allow:

1. Owner occupancy.
2. Work by Others.
3. Work by Owner.
4. Use of adjacent sites by public.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.
   3. Driveways and Entrances: Keep driveways, parking garage, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, or emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

D. Time Restrictions:
   1. Limit conduct of especially noisy, malodorous, and dusty exterior work to the hours of 7 am to 8 pm, Monday thru Friday.

E. Utility Outages and Shutdown:
   1. Notify Design Professional, Owner, and Construction Manager not less than two (2) days in advance of proposed life safety system or utility interruptions.
   2. Prevent accidental disruption of utility services to other facilities.

1.07 WORK SEQUENCE

A. Coordinate construction schedule and operations with Owner, Construction Manager and Architect. Before commencing Work of each phase, submit a schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

B. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

C. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. Execute cutting and patching to integrate elements of Work, uncover ill-timed, defective, and non-conforming Work, provide openings for penetrations of existing surfaces, and provide samples for testing if required. Seal penetrations through floors, walls, and roof.

1.08 DEFINITIONS AND EXPLANATIONS

A. Imperative language is used generally in the specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor as if preceded by the phrase “The Contractor shall”.

B. The term “provide” means furnish and install, complete, and ready for intended use. Except as otherwise defined in greater detail, the term “furnish” means supply and deliver to the project site, including unloading, unpacking, inspecting, and storing until ready for receipt by Owner, installation, etc., as applicable.

C. Except as otherwise defined in greater detail, the term “install” is used to describe operations at project site including assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, as applicable.

D. The term “indicated” is as cross-reference to graphics, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as “shows”, “noted”, “schedules”, and “specified” are used in lieu of “indicated”, it is for purpose of helping reader locate cross-reference, and no limitations of location is intended.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

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SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

1.02 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Design Professional for approval.

B. Forms filled out by hand will not be accepted.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Design Professional for approval.

C. Forms filled out by hand will not be accepted.

D. Execute certification by signature of authorized officer.

E. Submit one electronic and three hard-copies of each Application for Payment.

1.04 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Design Professional will issue instructions directly to Contractor.

B. For other required changes, Design Professional will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Design Professional will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 15 days.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

E. Execution of Change Orders: Design Professional will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

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SECTION 01 21 00
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CASH ALLOWANCES

A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, including purchase, delivery and installation.

B. Design Professional Responsibilities:
   1. Consult with Contractor for consideration and selection of products, suppliers , and installers.
   2. Select products in consultation with Owner and transmit decision to Contractor.

C. Contractor Responsibilities:
   1. Assist Design Professional in selection of products, suppliers , and installers.
   2. Obtain proposals from suppliers and installers and offer recommendations.

D. Differences in costs will be adjusted by Change Order.

1.04 ALLOWANCES SCHEDULE

A. **ALLOWANCE #1:** Include in the bid amount a cash allowance of $40,000 for design, procurement, fabrication and installation of Vinyl Wall Graphics noted to be used by allowance.

B. **ALLOWANCE #2:** Include in the bid amount a cash allowance of $240,000 for General Construction changes.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 22 00
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 RELATED REQUIREMENTS

A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for Unit Prices.

1.03 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Documents are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

B. A schedule of unit prices is included below. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

1.05 MEASUREMENT OF QUANTITIES

A. Unit prices shall be included in the contractors bid and bid documents and issued to the Architect prior to construction as part of the submittal package.

B. Adjustments in the contract price will be made due to changes in the number and length of drilled piers, based on unit prices established in this Agreement as follows:

C. Payment for drilled piers will be made on actual net volume of drilled piers in place and accepted. Actual length and shaft diameter may change due to job conditions. Adjusted payment will be made based on net variations to the total quantities, based on design dimensions.

D. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

E. Take all measurements and compute quantities. Measurements and quantities will be verified by Design Professional.

F. Assist by providing necessary equipment, workers, and survey personnel as required.

G. Measurement Devices:
   1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
   2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
   3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.

H. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

I. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

J. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

K. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

L. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Design Professional prior to starting work.

1.06 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Design Professional, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected Products.

1.07 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not complying with specified requirements.

B. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.

1.08 SCHEDULE OF UNIT PRICES

A. Provide the following unit costs if additions to, or deductions from, work are required and authorized in writing by the Architect/Engineer:
   1. Additional length of drilled pier ($/per cubic yard).
   2. Subtracted length of drilled pier ($/per cubic yard).
   3. Soil excavation ($/per cubic yard).
   4. Rock excavation ($/hr).
   5. Removal of obstructions ($/hr).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 23 00
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates.

B. Procedures for pricing Alternates.

1.02 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.03 SCHEDULE OF ALTERNATES

ALTERNATE 1: STORM SHELTER ADDITION

BASE BID: NO STORM SHELTER OR ASSOCIATED WORK.

ADD ALTERNATE BID: CONSTRUCT NEW STORM SHELTER ADDITION AND ALL ASSOCIATED WORK.

ALTERNATE 2: BULLET RESISTANT PUBLIC CORRIDOR WALLS AND DOORS

BASE BID: IDENTIFIED PUBLIC CORRIDOR WALLS, DOORS AND FRAMES CONSTRUCTED USING TYPICAL STUD WALL ASSEMBLY AND TYPICAL DOORS AND FRAMES.

ADD ALTERNATE BID: IDENTIFIED PUBLIC CORRIDOR WALLS, DOORS AND FRAMES CONSTRUCTED TO BE BULLET RESISTENT.

ALTERNATE 3: BULLET RESISTANT EXTERIOR WINDOWS AND DOORS

BASE BID: IDENTIFIED EXISTING WINDOWS TO REMAIN.

ADD ALTERNATE BID: IDENTIFIED WINDOWS AND DOORS TO BE REPLACED WITH BULLET RESISTANT WINDOW UNITS, INCLUDING FRAMES AND GLAZING.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Progress meetings.

E. Construction progress schedule.

F. Submittals for review, information, and project closeout.

G. Number of copies of submittals.

H. Requests for Interpretation (RFI) procedures.

I. Submittal procedures.

J. Release of CAD/BIM files

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: General product requirements.

B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

C. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

D. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

E. Supervision: On-site superintendent to oversee project coordination and on-site supervision for duration of Project active work-on-site is underway.

1.03 PROJECT COORDINATOR

A. Project Coordinator: General Contractor.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Design Professional through the Project Coordinator:
   1. Requests for Interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.

9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. The web-based software will provide status logs, reports, searching and automated notifications.
   2. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   3. Contractor and Design Professional are required to use this service.
   4. It is Contractor's responsibility to submit documents in allowable format.
   5. Subcontractors, suppliers, and Design Professional's consultants are to be permitted to use the service at no extra charge.
   6. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   7. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
   8. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts, which shall be delivered by mail or courier.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.

C. Submittal Service:
   1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com/#sle.
   2. Procore: www.procore.com.

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Design Professional and Contractor participating; further training is the responsibility of the user of the service.

E. Duration of Documentation Service: Contractor shall provide continuous service access for construction documentation for the duration of the project to sixty (60) days after Final Completion.

F. Consolidated archive sets of files managed by the service is included and shall be made available by the Contractor to the project team.

3.02 RELEASE OF CAD/BIM FILES

A. Contractors or Subcontractors may request plans for their use/benefit for assistance in preparing submittals or for use in construction.
   1. The Revit model will be provided at no charge.
   2. If CAD files, contractor shall identify specific sheets to be produced as files. A fee may be charged for CAD files other than Revit.

3. A signed CAD release form is required.

3.03 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Design Professional.
   3. Contractor.
   4. Project Coordinator.
   5. Major subcontractors.

C. Agenda:
   1. Safety
   2. Construction Schedule
   3. Site Logistics
   4. Discussion of electronic document submittal procedures.
   5. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   6. Designation of personnel representing the parties to Contract, the Owner's Representative and Architect/Engineer.
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Scheduling.

D. Project Coordinator will record minutes and distribute copies within 7 days after meeting to participants, with copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Design Professional.
   4. Contractor's superintendent.
   5. Major subcontractors.
   6. Major Suppliers.
   7. Additional consultants, subcontractors, suppliers and product representatives as appropriate to agenda topics for each meeting.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to work.

D. Contractor will record minutes and distribute copies within 7 days after meeting to participants.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.06 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to Owner.
   3. Prepare using software provided by the Electronic Document Submittal Service.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
      d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
   3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
      a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Design Professional, and any of its consultants, due to processing of such RFIs.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.

1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. Owner's, Design Professional's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.

H. Review Time: Design Professional will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Design Professional within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.07 SUBMITTAL SCHEDULE

A. Submit to Design Professional for review a schedule for submittals in tabular format.
1. Submit at the same time as the preliminary schedule specified in Section - 01 32 16 - Construction Progress Schedule.
2. Coordinate with Contractor's construction schedule and schedule of values.
3. Format schedule to allow tracking of status of submittals throughout duration of construction.
4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.
   5. Other types indicated.

B. Submit to Design Professional for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Design Professional's knowledge as contract administrator or for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Documents for Review: All submittals except for samples shall be provided electronically through the Project Coordinator to the Architect.

C. Documents for Information: Submit electronically to the Architect.

D. Extra Copies at Project Closeout: See Section 01 78 00.

E. Samples: Submit the number specified in individual specification sections; one of which will be retained by Design Professional.
   1. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.

3. Transmit using approved form.
    a. Use Contractor's form, subject to prior approval by Design Professional.
4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
    a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
    a. Upload submittals in electronic form to Electronic Document Submittal Service website.
7. Schedule submittals to expedite the Project, and coordinate submission of related items.
    a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
    b. For sequential reviews involving Design Professional's consultants, Owner, or another affected party, allow an additional 7 days.
8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
9. Provide space for Contractor and Design Professional review stamps.
10. When revised for resubmission, identify all changes made since previous submission.
11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
13. Submittals not requested will be recognized, and will be returned "Not Reviewed",

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Submit concurrently with related shop drawing submittal.
4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.13 SUBMITTAL REVIEW

A. Submittals for Review: Design Professional will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Design Professional will acknowledge receipt and review. See below for actions to be taken.

C. Design Professional's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Design Professional's and consultants' actions on items submitted for review:

1. Authorizing purchasing, fabrication, delivery, and installation:
    a. "Approved", or language with same legal meaning.
    b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
        1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
    c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
2. Not Authorizing fabrication, delivery, and installation:
    a. "Revise and Resubmit".
        1) Resubmit revised item, with review notations acknowledged and incorporated.

E. Design Professional's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
    a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:
    a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. References and standards.

C. Control of installation.

D. Mock-ups.

E. Tolerances.

F. Manufacturers' field services.

G. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures.

B. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Design Data: Submit for Design Professional's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Design Professional and to Contractor.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Design Professional, in quantities specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.04 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Design Professional before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Design Professional shall be altered from Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Design Professional before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Design Professional will use accepted mock-ups as a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Design Professional and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Design Professional.

E. Schedule of Mock-Ups:

1. 04 20 00 Unit Masonry
2. 04 26 13 Masonry Veneer
3. 06 61 16 Solid Surface Fabrications
4. 07 42 13.23 Metal Composite Material Wall Panels
5. 09 30 00 Tiling
6. 09 54 30 Suspended Wood Grilles
7. 09 72 00 Wall Coverings
8. 10 14 00 Signage
9. 10 14 05 Environmental Graphics
10. 12 24 00 Window Shades

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Design Professional before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Design Professional and Contractor in performance of services.

2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Design Professional and Contractor of observed irregularities or non-compliance of Work or products.
5. Perform additional tests and inspections required by Design Professional.
6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
4. Notify Design Professional and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Design Professional.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Design Professional, it is not practical to remove and replace the work, Design Professional will direct an appropriate remedy or adjust payment.

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SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary telecommunications services.

C. Temporary sanitary facilities.

D. Temporary Controls: Barriers, enclosures, and fencing.

E. Security requirements.

F. Vehicular access and parking.

G. Waste removal facilities and services.

H. Project identification sign.

I. Field offices.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

1.03 TEMPORARY UTILITIES

A. Owner will provide the following:
   1. Electrical power and metering, consisting of connection to existing facilities.
   2. Water supply, consisting of connection to existing facilities.

B. Contractor is responsible for the following:
   1. Portable cylinders for storage and gas usage for temporary heating equipment.

1.04 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

1.05 TEMPORARY SANITARY FACILITIES

A. Provide, in a sanitary condition, chemical type portable toilet facilities for use by contractor personnel outside in the existing building. Toilets and toilet location shall be subject to approval by the Owner's Representative.

B. Maintain daily in clean and sanitary condition.

1.06 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

1.07 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.08 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

1.09 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.10 PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated on drawings.

B. Erect on site at location indicated.

C. No other signs are allowed without Owner permission except those required by law.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations.

F. Procedures for Owner-supplied products.

G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.
   1. See Section 01 10 00 for list of items required to be salvaged for reuse and relocation.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Where other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured closer to the location of the project.
   2. Have longer documented life span under normal use.
   3. Result in less construction waste. See Section 01 74 19

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

D. "Similar and equivalent to" indicates an example product that meets specifications. This example is not considered a 'named' product.

E. "Basis of Design" indicates applicable characteristics of named product were used to design systems. "Similar and equal to" is implied unless otherwise indicated. When provision for substitution is stated, submit a request for any manufacturer or product not named.

F. "Approved Equal" with a provision for substitutions: Contractor may submit a request for substitution for any manufacturer not named. The example is considered a 'named' product. The allowance for substitutions does not warrant that a substitution is known or exists.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

C. Record delivery date and time in Contractor As-Built Document Set.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Substitutions of products, materials, equipment, or methods of construction will not be considered except in the following instances:
   1. The specified item cannot be provided within the Contract time (substitutions will not be considered if this is the result of the Contractor's failure to pursue the work in a timely manner).
   2. The requested substitution offers the Owner a substantial savings in cost, time, or energy conservation.
   3. The specified item cannot be installed due to incompatibility with other materials, failure to comply with applicable codes, etc

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

D. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse the Owner and Architect/Engineer for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit PDF copy of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect/Engineer will notify Trade Contractor in writing of decision to accept or reject request.
   4. Identify product by Contractor Specification Section and article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.
   5. Attach product data as specified in Section 01 30 00 - Submittals.
   6. List similar projects using product, dates of installation, and names and phone numbers of Architect and Owner.
   7. Give itemized comparison of proposed substitution with specified product, listing quality and performance variations, and reference to Specification Section and article number.
   8. Give cost data comparing proposed substitution with specified product, and amount of net change to Contract price.
   9. List nearest availability of maintenance services and replacement materials.
   10. State effect of substitution on construction schedule, and changes required in other work or products.

G. Acceptance of a substitute manufacturer does not waive or alter any specified product requirement.

3.02 OWNER-SUPPLIED PRODUCTS

A. See Section 01 10 00 - Summary for identification of Owner-supplied products.

3.03 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 60 01
SUBSTITUTION REQUEST FORM

We hereby submit for your consideration the following product instead of the specified item for the following project:

PROJECT TITLE _____ PROJECT NO. _____

DRAWING NO. _____ DRAWING TITLE _____

SPEC. SECTION SPEC. TITLE PARAGRAPH SPECIFIED ITEM

_____ _____ _____ _____

Proposed Substitution:_____

Attach complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Submit, with request, all necessary samples and substantiating data to prove equal quality and performance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance.

Substitutions of the materials and equipment described in the Contract Documents will be considered during the bidding period upon receipt or a written request to the Architect for approval up to three (3) days before receipt of bids. Verbal or written requests without the completed Substitution Request Form will not be considered.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

The undersigned states that the function, appearance, and quality are equivalent or superior to the specified item.

Submitted by:

_____

Signature

_____

Firm

_____

Address

_____ _____ _____

Telephone Email Date

Signature shall be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

Fill in Blanks Below:

A. Does the substitution affect dimensions shown on Drawings? Yes No

If yes, clearly indicate changes:

_____

_____

B. Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution? Yes No

If no, fully explain:

_____

_____

C. What effect does substitution have on other Contracts or other trades?

_____

_____

D. What effect does substitution have on construction schedule?

_____

_____

E. Manufacturer's warranties of the proposed and specified items are:

_____ Same _____ Different (Explain on Attachment)

F. Reason for Request:

_____

_____

G. Itemized comparison of specified item(s) with the proposed substitution.

List significant variations:

_____

_____

H. Accurate cost data comparing proposed substitution with product specified:

_____

_____

I. Designation of maintenance services and sources:

_____

_____

(ATTACH ADDITIONAL SHEETS IF REQUIRED)

For Use by Design Professional:

_____ Recommended _____ Recommended as Noted

_____ Not Recommended _____ Received Too Late

Signed By _____

Date _____

For Use by Owner's Representative or Owner:

_____ Approved _____ Approved as Noted

_____ Not Approved _____ Approved Too Late

Signed By _____

Date _____

END OF SECTION

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Cleaning and protection.

E. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01 30 00 - Administrative Requirements: Submittals procedures, Electronic document submittal service.

C. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.

D. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.

E. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties .

F. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 COORDINATION

A. See Section 01 10 00 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Design Professional five days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Design Professional, Owner, participants, and those affected by decisions made.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work tightly to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

3.07 PROTECTION OF EXISTING AND INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 FINAL CLEANING

A. Execute final cleaning prior to Substantial Completion.
   1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Replace filters of operating equipment.

G. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

H. Clean Owner-occupied areas of work.

3.09 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Design Professional and Owner.

B. Accompany Contractor and/or Owner on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Design Professional when work is considered ready for Design Professional's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Design Professional's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Design Professional's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Design Professional.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Design Professional when work is considered finally complete and ready for Design Professional's Substantial Completion final inspection.

H. Complete items of work determined by Design Professional listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project record documents.

B. Operation and maintenance data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Design Professional after Substantial Completion but before final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Design Professional will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Design Professional comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawingsand Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Provide two (2) physical document sets.

B. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

C. Binders: Submitted in electronic format on flash drive permanently labeled with the project name and readily capable of being printed in an organized format for the Owner's later use.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Design Professional, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Retain warranties and bonds until time specified for submittal.

END OF SECTION

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SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alteration purposes.

D. Coordination requirements with Work by separate asbestos abatement contract.

1.02 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove paving and curbs required to accomplish new work.

B. Remove other items indicated, for salvage, relocation, and recycling.

C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   5. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
   6. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
   7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements to remain in place and not removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. If hazardous materials are discovered during removal operations, stop work and notify Design Professional and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
   1. Abatement Project: Under separate concurrent contract, asbestos abatement activities will be facilitated within the defined limits of This Project. Coordination items between Contracts, not limited to: site access, waste removal, temporary protection.
   2. Asbestos abatement is anticipated to impact the following items: Flooring and/or mastic (basement, first and second floor), plumbing insulation (basement).
   3. Demolition scope by this project impacted by items that require asbestos abatement must occur after completion of abatement work. At completion of abatement Work, Contractor shall review site conditions relative to this Project's remaining Work. Contractor shall provide notice to the Owner's Representative of any building items believed to be damaged, missing or generally non-conforming. Resuming Work acknowledges acceptance of existing site conditions.
      a. Non-conforming items include plastic, tape, tape residue, and other items use for temporary protection during abatement activities.

F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
   1. Verify construction and utility arrangements are as indicated.
   2. Report discrepancies to Design Professional before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and required to accomplish new work.
   1. Remove items indicated on drawings.

C. Protect existing work to remain.
   1. Prevent movement of structure. Provide shoring and bracing as required.
   2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch to match new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

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SECTION 03 10 00
CONCRETE FORMWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Design, construction and treatment of formwork and related accessories to confine and shape concrete to the required dimensions.

B. Structural notes indicated on the drawings regarding concrete formwork shall be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 20 00 - Concrete Reinforcement.

C. Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where provisions of the pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
   1. ACI 301 - Specifications for Structural Concrete.
   2. ACI 318 - Building Code Requirements for Structural Concrete.
   3. ACI 347 - Guide to Formwork for Concrete.
   4. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
   5. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   6. NIST - PS 1: Structural Plywood

1.4 DESIGN REQUIREMENTS

A. Design and engineering of formwork is the responsibility of the Contractor. Design, engineer and construct formwork, shoring, and bracing to conform to Contract Documents and in accordance with . Formwork design shall be under direct supervision of a **Professional** engineer experienced in the design of this work and licensed in the State where the project is located. Design for construction loads, lateral pressure, and requirements of the applicable building code to conform to the required shape, line, and dimensions. Contractor is responsible for formwork camber calculations.

B. Drawings show the design requirements and dimensions for structural strength, but structural drawings do not show all detail dimensions to fit intricate architectural and mechanical detail. Contractor shall construct the concrete work so that it will conform to the clearance required by the architectural, mechanical, and electrical design.

C. Maximum deflection of facing materials forming concrete surfaces exposed to view shall be 1/240 of the center-to-center span between structural members of the formwork.

D. Carry vertical and lateral loads to the ground by a formwork system and in-place construction that has attained adequate strength for that purpose. Where adequate foundations for shores and struts cannot be secured, provide trussed supports.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions and specifications for each of the following:
   1. Void form if used
   2. Corrugated steel form deck if used.

B. Testing for Formwork Removal: When methods other than cylinder tests are proposed for determining time for formwork removal, submit data on methods for approval.

1.6 COORDINATION

A. Coordinate with other sections of work that require attachment of components to formwork.

B. If formwork is placed after reinforcement, resulting in insufficient concrete cover to reinforcement, request instructions from the Owner's Representative or Architect or Structural Engineer before proceeding.

PART 2 - PRODUCTS

2.1 CONSTRUCTION OF TEMPORARY FORMWORK

A. In accordance with ACI 301, construct formwork:

   1. Design, erect, shore, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until the concrete structure can support such loads.
   2. Obtain approval before framing openings in structural members not indicated on the drawings.

B. Fabricate forms for easy removal without hammering or prying against concrete surfaces.

   1. Provide crush or wrecking plates where stripping may damage cast concrete surfaces.
   2. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
   3. Chamfer wood inserts for forming keyways, reglets, recesses, and the like to allow wood to swell without spalling concrete and to ensure easy removal.

C. Falsework:

   1. Provide positive means of adjustment (wedges or jacks) of shores and struts. Do not adjust formwork after concrete has taken its initial set. Brace formwork securely against lateral deflection and lateral instability.
   2. To maintain specified tolerances, camber formwork to compensate for anticipated deflections in formwork prior to hardening of concrete. Formwork camber calculations are the responsibility of the formwork designer. Set formwork and intermediate screed strips for slabs accurately to produce designated elevations and contours of the finished surface prior to removal of formwork. Ensure edge forms and screed strips are sufficiently strong to support vibrating screeds or roller pipe screeds when the finish specified requires the use of such equipment.

3. When formwork is cambered, set screeds to a like camber to maintain required concrete thickness.
4. Verify lines, levels, and centers before proceeding with formwork. Ensure dimensions agree with the drawings.
5. Fasten form wedges in place after final adjustment of forms and prior to concrete placement.
6. Anchor formwork to shores, supporting surfaces, or members to prevent upward or lateral movement of the formwork system during concrete placement.
7. Securely brace and shore forms to prevent displacement and to safely support construction loads.
8. Construct forms plumb and straight to conform to slopes, lines, and dimensions shown.
9. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
10. Provide runways for moving equipment and support runways directly on formwork or structural member without resting on the reinforcing steel.

D. Do not use rust-stained steel form-facing material.

E. Unless noted otherwise, all drilled piers shall be centered under walls, piers, or columns.

F. Provisions for Other Trades:

1. Place sleeves, inserts, anchors, and embedded items required for adjoining work or for support of adjoining work prior to concrete placement.
2. Position and support expansion joint material and other embedded items to prevent displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material to prevent entry of concrete into voids.

G. Cleaning:

1. Clean surfaces of formwork and embedded materials of mortar, grout, and foreign material before concrete is placed.
2. Clean and inspect formwork immediately before concrete is placed.

H. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.

2.2 COORDINATION

A. Install all required pipe sleeves, cavities or slots. Notify appropriate trades in due time so they may furnish information and make necessary installations. Check sizes, location and alignment of all openings, frames and other work, which are to be built-in including electrical boxes and conduit.

B. Layout the run of partitions and establish location of openings so other trades may properly locate their work.

C. Core drilling concrete is not permitted unless noted otherwise or approved in writing by the Architect. Notify the Architect in advance of conditions not shown on the drawings.

2.3 INSTALLATION OF EMBEDDED ITEMS

A. Built-In Items:

1. Confirm with Architect that all materials to be embedded are suitable for embedment in concrete.
2. Build in anchors, inserts, and other devices indicated or required for various portions of work.
3. Build in sleeves, thimbles, and other items furnished or set in place by other trades.
4. Accurately position and support all embedded items prior to concrete placement. Secure embedded items against displacement during concrete placement operations.
5. Fill voids with readily removable material to prevent entry of concrete into voids.
6. Mechanical and Electrical shall provide and set required sleeves.
7. Coordinate setting of all embedded items.

2.4 TOLERANCES

A. Construction formwork to maintain tolerances required by ACI 301 and ACI 117.

2.5 REMOVAL OF FORMS

A. When removal is based on concrete reaching a specified compressive strength, concrete will be presumed to have reached this strength when either of the following requirements has been met:

1. Test cylinders, molded and cured under the same conditions for moisture and temperature as used for the concrete they represent, have reached the specified compressive strength.
2. Concrete has been cured in accordance with the specifications for the same length of time as laboratory-cured cylinders, which have reached the specified strength. Determine the length of time concrete has been cured in the structure by the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50F and the concrete has been damp or thoroughly sealed from evaporation and loss of moisture.

B. Loosen wood formwork for wall openings when this can be accomplished without causing damage to concrete.

C. Do not allow removal of formwork to damage the fresh concrete for columns, walls, sides of beams, and other parts supporting the weight of the concrete. Perform needed repair and treatment required on vertical surfaces at once and follow immediately with specified curing.

2.6 FASTENER REMOVAL

A. Remove all protruding fasteners left as a result of securing inserts to forms by Contractor responsible for insert.

B. Cutting flush with surface is not acceptable.

C. Patch exposed concrete surfaces if damaged during fastener removal process.

2.7 REMOVING AND REUSING FORMS

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

B. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Architect.

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SECTION 03 20 00
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fabrication and placement of reinforcing steel for concrete and all related accessories.

B. Reinforcing steel for use in bond beams, masonry columns, and lintels is specified in Division 4 and is not a part of the work in this section.

C. Structural notes indicated on the drawings regarding concrete reinforcement shall be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 10 00 - Concrete Formwork.

C. Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI SP-066 - ACI Detailing Manual.
5. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
6. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
7. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete.
8. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
9. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

1.4 SUBMITTALS

A. Placing Drawings: Submit placing drawings showing fabrication dimensions and locations for placement of reinforcement and reinforcement accessories. Indicate bar sizes, spacing, locations, and quantities of reinforcing steel, bending and cutting diagrams, anchors, and supporting and spacing devices. Dowels shall be shown in placing drawings for the element that is to be placed first. Reinforcing steel descriptions or shop drawings shall be inch-pound sizes.

B. Product Data: Submit product data sheets for all specified products.

1. Fibrous concrete reinforcing material.

    a. Application rate per cubic yard of concrete.
    b. Manufacturer's printed batching and mixing instructions.
    c. Letter of Certification that materials supplied meet or exceed ASTM C1116.

C. Splices: Submit request for splices not indicated in the Contract Documents. Request shall indicate locations, types, and lengths of splices for approval.

D. Field Bending: Submit requests and procedure for field bending or straightening of reinforcement partially embedded in concrete not described in the Contract Documents.

E. Reinforcement Relocation: Submit requests to adjust reinforcement spacing necessitated by conflicts with other reinforcement, conduits, etc. for approval.

F. Mechanical Connections: Submit request for the use of mechanical connections not shown on the project drawings. Include engineering data on proprietary connection devices for approval.

G. Welding Procedure Specifications: For welding of reinforcing steel, include designations of processes (e.g. SMAW, GAMW, FCAW, etc.), weld symbols, and details. All WPS shall be qualified by current Procedure Qualification Record (PQR) per AWS D1.4 and approved by the Structural Engineer.

H. Alternative Reinforcement: Submit request to relocate any reinforcing bars that exceeds placement tolerances.

1.5 COORDINATION

A. Coordinate reinforcement installation with the placement of formwork and other embedded items such as inserts, conduit, pipe sleeves, drains, metal supports, anchor rods, etc.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to the jobsite in bundles sorted and labeled with durable tags indicating bar size, length, and shop drawing mark. Bundles shall also bear testing laboratory tags indicating identified steel.

B. Store elevated clear of ground and protect at all times from contamination and deterioration.

C. Prevent bending, coating with earth, oil, or other material, or otherwise damaging the reinforcement.

D. Store welding electrodes in accordance with the requirements of AWS D1.4.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bar Deformations: Bars used for reinforcement shall be deformed except column spirals and welded wire reinforcement, which may be plain.

B. Reinforcing Steel: Reinforcing steel shall conform to the ASTM standard and grade indicated in the General Notes on the drawings.

C. Synthetic Macro Fiber Reinforcing: Shall meet the requirements of ASTM C1116, Type III, be approved by UL for use in a two-hour rated floor assembly and be specifically manufactured for use as concrete secondary reinforcement.

1. Fiber Length: 1-1/2" to 2".
2. Aspect Ratio: Between 70 and 100.
3. Specific Gravity: Between 0.90 and 0.93.
4. Mix proprietary materials in accordance with manufacturer's instructions, product data and technical bulletins.
5. Application Rate: Per drawings.

a. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include:

1) STRUX 90/40; Grace Construction Products.
2) Fibermesh 650; Propex Concrete Systems.
3) TUF-STRAND SF; Euclid Chemical Company.

D. Welded Wire Reinforcement: Welded wire reinforcement shall conform to the ASTM standard indicated in the General Notes on the drawings.

E. Joint Dowel Bars: Plain-steel bars. Cut bars true to length with square ends and free of burrs.

F. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, precast concrete, or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

2.2 FABRICATION

A. Fabrication Tolerances: Reinforcing steel shall be shop fabricated within tolerances according to ACI 117 and other applicable codes, and shall conform in size, shape, quantity, dimensions, etc. to the construction drawings and approved shop drawings.

B. Bar Condition: Bars shall be free from mill scale, excessive rust, and other coatings, which would reduce or destroy the bond with the concrete. Wipe oil from forms before reinforcement is placed on or adjacent to so that oil will not be tracked over or in any way come into contact with the reinforcement.

C. Bars Bending: Bars shall be bent cold, and no method of fabrication shall be used which would be injurious to the material. Heating of bars for bending is not permitted.

D. Identification: After fabrication, bars shall be sorted, bundled, and tagged with metal tags bearing the bar mark before delivery to the jobsite.

E. Reinforcing for continuous footings shall extend into spread footings a minimum of 2'-0".

F. Dowels between footings and walls or columns shall be the same grade, size and spacing or number as the vertical reinforcing respectively, unless noted otherwise.

PART 3 - EXECUTION

3.1 PLACING

A. Reinforcement Relocation: When necessary to move reinforcement beyond the specified spacing to avoid interference with other reinforcement, or embedded items, submit resulting arrangement of reinforcement to Structural Engineer for approval.

B. Reinforcement Cutting: Cutting of reinforcement which conflicts with embedded objects is not acceptable.

C. Welded Wire Reinforcement: Extend welded wire reinforcement to within 1 inch of the concrete edge. Lap edges and ends of fabric sheets a minimum of two panels or 12" minimum. Lace edges with 16-gauge tie wire. Support welded wire reinforcement during placing of concrete to assure required positioning in the slab. Do not place wire reinforcement on grade or metal deck and raise into position in freshly-placed concrete.

D. Wire Tie Orientation: Set wire ties so ends are directed away from the concrete surface.

E. Slab on Grade Reinforcement Placement: Place shrinkage and temperature reinforcement 1/3 of the slab thickness from the top surface of the slabs on grade unless noted otherwise on the drawings.

F. Do not cut, displace, or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

G. Support for Reinforcement: Unless noted otherwise, supports for reinforcement shall have Class 2 protection as defined in the CRSI Manual of Standard Practice. Submit data on supports indicating class of protection at all different locations for approval. Supports shall not be used as bases for runways for concrete-conveying equipment and similar construction loads. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.

H. Fibrous Reinforcement: Add fibrous reinforcement to concrete materials at the time concrete is batched in amounts indicated on the approved submittals for each type of concrete required.

    1. Mix concrete for uniform and complete distribution of fibrous reinforcement.

I. Support for Bars in Concrete Cast on Ground: Bar supports for slabs on grade, grade beams, footings, and all other concrete cast directly onto grade shall be supported at an average spacing of 4 feet or less in each direction.

J. Securing Reinforcing Bars: All bars must be placed, spaced, secured, and supported prior to casting concrete. Bars embedded in hardened or partially hardened concrete shall not be bent unless approved in writing prior to placement by the Structural Engineer.

K. Foot Traffic: Restrict foot traffic over the slab on grade reinforcing after it has been properly positioned.

L. Reinforcement at Expansion Joints: Do not continue reinforcement or other embedded metal items bonded to concrete through expansion joints. Dowels bonded on only one side of a joint and waterstops may extend through joint.

M. Pumping Concrete: When using a pump to place concrete, pump hose shall be supported directly on forms. Do not allow hose to rest on reinforcing bars if doing so could cause displacement of bars.

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SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. All items required for executing and completing the cast-in-place concrete work and related work shown on the drawings or specified herein. Work shall include installation of items furnished in other sections of these specifications.

B. **Drilled concrete piers** specified in Division 31.

C. Structural notes indicated on the drawings regarding cast-in-place concrete shall be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 10 00 - Concrete Formwork.

C. Section 03 20 00 - Concrete Reinforcement.

D. Section 31 63 29 – Drilled Concrete Piers

E. Section 03 35 11 Concrete Floor Finishes

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provision of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
4. ACI 302.2R - Guide for Concrete Slabs that Received Moisture-Sensitive Flooring Materials.

ACI 303.1 - Standard Specification for Cast-in-Place Architectural Concrete.

6. ACI 304R - Guide to Measuring, Mixing, Transporting, and Placing Concrete.
7. ACI 305.1 - Specification for Hot Weather Concreting.
8. ACI 306.1 - Guide to Cold Weather Concreting.
9. ACI 308R - Guide to External Curing of Concrete.
10. ACI 309R - Guide for Consolidation of Concrete.
11. ACI 318 - Building Code Requirements for Structural Concrete.
12. ACI 347R - Guide to Formwork for Concrete.
13. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
14. ASTM C33 - Standard Specification for Concrete Aggregates.
15. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

16. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
17. ASTM C88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
18. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
19. ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
20. ASTM C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
21. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
22. ASTM C150 - Standard Specification for Portland Cement.
23. ASTM C157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
24. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
25. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
26. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
27. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
28. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
29. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
30. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
31. ASTM C595 – Standard Specification for Blended Hydraulic Cements.
32. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
33. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
34. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete.
35. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
36. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
37. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
38. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
39. ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
40. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
41. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
42. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

1.4 SAMPLING AND TESTING REQUIREMENTS

A. Maintain records verifying materials used are of the specified and accepted types and sizes and are in conformance with the requirements of the Contract Documents.

B. Use of testing services will not relieve the Contractor of the responsibility to furnish materials and construction in full compliance with the Contract Documents.

C. Take samples of fresh concrete at the job site for each mix design placed each day. Sampling and testing shall be done after the final addition and proper mixing of any water or admixtures that are added on site.

1. Personnel and testing equipment shall meet the requirements of ASTM E329.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or 5,000 sq. ft. of surface area, whichever is less or fraction thereof of each concrete mixture placed each day.

    a. On a given project, if the total volume of concrete is such that the frequency of testing required above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

3. A strength test shall be the average compressive strength of two 6x12 inch or two 4x8 inch cylinders made from the same sample of concrete and tested at age indicated.

D. For each sample of fresh concrete, perform the following duties:

1. Measure and record slump in accordance with ASTM C143.
2. Measure and record temperature in accordance with ASTM C1064.

    a. Provide one test hourly when air temperature is 40F and below and when 80F and above, and one test for each composite sample.

3. Measure and record air content by volume in accordance with either ASTM C231 or ASTM C173.

4. Mold strength test cylinders in the field in accordance with ASTM C31. Protect from moisture loss and maintain at 60F to 80F for 24 to 48 hours before moving to the laboratory. Deliver cylinders to testing laboratory for curing and testing.

5. Mold one cylinder (field cylinder) in accordance with ASTM C31 to be field-cured. Field cylinder shall be placed as near as possible to the in-place concrete from which it was taken, protected, and cured in the same manner. Deliver field-cured cylinder to testing laboratory, and measure and record compressive strength in accordance with ASTM C39. Field cylinder shall be used to determine if concrete footings, walls, or piers have reached the required compressive strength for steel erection to begin.

E. Measure and record compressive strength in accordance with ASTM C39 for strength test specimens.

1. For specified concrete strengths less than 8,000 psi:
    a. Test one cylinder at 7 days and one strength test at 28 days. Hold one final strength test for testing at 56 days at discretion of the Structural Engineer.
2. Any additional cylinders modeled for Contractor to have a compressive strength test done before 7 days shall be at the Contractor's expense.

F. Prepare and submit test reports to the **Architect, Engineer, Contractor and Supplier**. Reports shall be completed and furnished within 48 hours of testing. Refer to description in Submittals.

G. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

H. Should the strength of any grade of concrete for any portion of work, as indicated by molded test cylinders, fall below the minimum compressive strength, at the age specified on the drawings and/or specifications, upon approval of the Structural Engineer, the concrete supplier shall adjust the concrete mix for remaining portion of construction so that the resulting concrete meets the minimum strength requirements.

1.5 SUBMITTALS

A. Concrete Materials: Submit information on concrete materials as listed below.

1. Cementitious Materials: Submit type, class, producer name, and certification not more than 90 days old of compliance with applicable ASTM standard.
2. Aggregates: Submit type, pit or quarry location, producer name, gradations, specific gravity, water content, and certification not more than 90 days old.
3. Admixtures: Submit product data sheet. Product data shall include: dosages and performance data, brand names, producers, chloride ion concentrations, and certifications of compliance with applicable ASTM standard. Certifications shall not be more than 90 days old.
4. Water: Portable

B. Testing Agency Qualifications: When requested, the proposed testing agencies shall submit data on qualifications for acceptance.

C. Concrete Mix Design:

1. Concrete mix design submittals shall be submitted to the Structural Engineer for review and approval at least 14 days prior to placing concrete.
2. Obtain Structural Engineer approval for each mix design prior to use, including new mix designs required to be prepared should there be a change in materials being used.
3. Submit concrete mixture proportions and characteristics for each concrete mix. Include standard deviation analysis or trial batch data with mix design. Submit historical field test data to demonstrate the average compressive strength for approval. Concrete mix proportions, materials, and handling methods for field test data or trial batches shall be the same as used for the work. Include the following information for each mix design:

    a. Water/cementitious materials ratio.
    b. Slump per ASTM C143
    c. Air content per ASTM C231 or ASTM C173
    d. Unit weight of concrete per ASTM C138
    e. Compressive strength at age specified per ASTM C39

4. If trial batches are used, submit representative samples of each proposed ingredient to independent testing laboratory for use in preparation of mix design.
5. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at Project site.
6. Provide a record copy of the final mix designs and test results to the testing agency prior to commencement of the concrete work.

D. Repair Methods: When stains, rust, efflorescence, and surface deposits must be removed, submit the proposed method of removal.

E. Certificates: Submit written certification regarding the design mix from the ready-mix supplier and the admixture manufacturer stating all concrete and admixtures do not contain chloride ions in excess of concentrations specified herein.

F. Placement Notification: Notify the Architect at least 48 hours in advance of concrete placement.

G. Adjustments: Submit any adjustments to mixture proportions or changes in materials, suppliers, or sources, along with supporting documentation, during the course of the work.

H. Cold Weather Procedure Submittal: Refer to Cold Weather Concreting article in Part 3 for more information.

I. Record Documents: Accurately record actual locations of embedded utilities and components that are concealed from view.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Cementitious Materials: Store cementitious materials in dry weather tight buildings, bins, or silos that exclude contaminants.

B. Aggregates: Store and handle aggregate in a manner that will avoid segregation and prevent contamination with other materials or other sizes of aggregates. Store aggregates so as to drain freely.

C. Admixtures: Protect stored admixtures against contamination, evaporation, or damage. Protect liquid admixtures from freezing and temperature changes, which would adversely affect their performance. Handle chemical admixtures in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Portland Limestone Cement: Portland limestone cement (PLC) shall conform to ASTM C595, Type IL. Use one brand of PLC throughout project, unless approved in writing by the Engineer. PLC used in concrete shall be the same as used in the concrete represented by the submitted field test data or used in the trial mixtures. Maintain consistent PLC color throughout project unless directed otherwise by architectural requirements.

1. Total replacement of Portland limestone cement by supplementary cementitious materials in design mixture shall not exceed 25% (by weight).

B. Supplementary Cementitious Materials

1. Fly Ash: Fly ash shall conform to ASTM C618, Class C or Class F. Replacement of Portland cement by fly ash shall not exceed the following (percentages are by weight):

    a. Concrete Flatwork: 15 percent.
    b. Mass Concrete (more than two feet thick): 50 percent.
    c. All other concrete: 25 percent.
    d. Concrete to be placed in cold weather as defined herein: No fly ash allowed unless the cold weather procedure submitted has compensated for the increased setting time and decreased rate of strength gain due to cold weather and fly ash.

C. Coarse Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide coarse aggregate from a single source for exposed concrete. Gradations shall be similar to that described in the following table:

COARSE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 16
4	90-100 Note 1	20-55	0-15	---	0-5	---	---
57	100	95-100	---	25-60	0-10	0-10	---
67	---	100	90-100	---	20-55	0-10	---
89	---	---	---	100	90-100	20-55	0-10

1. Shall be 100 percent passing the 2" sieve.

D. Fine Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide fine aggregate from a single source for exposed concrete. Fine aggregate shall consist of washed sand. Gradations shall be similar to that described in the following table:

FINE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	3/8	No. 4	No. 8	No. 16	No. 50	No. 80	No. 100
FA	100	95-100	80-100	50-85	5-30	---	0-10

E. Do not use aggregates containing deleterious substances that could cause spalling on any exterior exposed surface. These include, but are not limited to the following:

1. Organic impurities.
2. Ferrous metals.
3. Soluble salts.
4. Coal, lignite, or other lightweight materials.
5. Soft particles.
6. Clay lumps and friable particles.
7. Cherts of less than 2.40 specific gravity.

F. Water: Mixing water for concrete shall meet the requirements of ASTM C94. Water shall be clean and free from injurious amounts of acids, alkalis, organic materials, chloride ions and oils deleterious to concrete or reinforcing steel.

G. Testing agency shall be given access to plants and stockpiles to obtain samples for testing for compliance with the Contract Documents.

2.2 ADMIXTURES

A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures. Calcium chloride thiocyanates or admixtures containing intentionally added chlorides are not permitted.

B. Water Reducing Admixture: Material shall comply with ASTM C494, Type A.

1. Acceptable:

a. Master Builders Solutions - MasterPozzolith Series or MasterPolyheed Series.
b. Chemical Company - Eucon WR Series.
c. Sika Chemical Corp. - Plastocrete 161.
d. GRT - Polychem 400 NC.
e. Grace Construction Products - WRDA 82.

C. High Range Water Reducing Admixture (superplasticizer): Material shall comply with ASTM C494, Type F or Type G.

1. Acceptable:

a. Master Builders Solutions - MasterRheobuild 1000 or MasterGlenium Series.
b. Euclid Chemical Company - Eucon 37 or Plastol Series.
c. Sika - ViscoCrete 2100.
d. GRT - Melchem.
e. Grace Construction Products - Mira 110.

D. High Range Water Reducing, Slump Retaining Admixture: Material shall comply with ASTM C494, Type F or Type G.

1. Acceptable:

a. Master Builders Solutions - MasterGlenium 7700.
b. Euclid Chemical Company - Eucon 537, Eucon 1037, or Plastol Series.
c. Sika - Sikament 686.
d. GRT - Melchem - M.
e. Grace Construction Products - ADVA FLEX.

E. Non-Chloride Accelerator: Material shall comply with ASTM C494, Type C or Type E, and not contain a higher chloride ion concentration than municipal drinking water.

1. Acceptable:

a. Master Builders Solutions - MasterSet FP 20 or MasterSet AC 534.
b. Euclid Chemical Company - Accelguard Series.
c. Sika Chemical Corp. - Sika Rapid-1.
d. GRT - Polychem HE.
e. Grace Construction Products - Lubricon NCA.

F. Air Entraining Admixture: Air entraining admixture shall comply with ASTM C260, and be certified by the manufacturer to be compatible with other admixtures to be used.

1. Acceptable:

a. Master Builders Solutions - MasterAir Series.
b. Euclid Chemical Company - Air-Mix or AEA Series.
c. Sika Chemical Corporation - Sika-Aer.
d. GRT - Polychem VR.
e. Grace Construction Products - Darex II or Daravair 1000.

G. Water Reducing and Retarding Admixture: Material shall comply with ASTM C494, Types B and D.

1. Acceptable:

a. Master Builders Solutions - MasterSet R Series or MasterSet DELVO Series.
b. Euclid Chemical Company - Eucon Retarder Series.
c. Sika Chemical Corporation - Plastiment.
d. GRT - Polychem - R.
e. Grace Construction Products - Daratard 17 or Recover.

H. Admixtures used in concrete shall be the same brand, type, and dosage used in concrete represented by field test data or used in trial mixes.

2.3 CURING PRODUCTS

A. Dissipating Resin Curing Compound: Clear, waterborne, membrane-forming curing compound complying with ASTM C309, Type 1, Class B shall be composed of hydrocarbon resins and dissipating agents that begin to break down upon exposure to ultraviolet light and traffic approximately 4 to 6 weeks after application, providing a film that is removable with standard degreasing agents and mechanized scrubbing actions so as to not impair the later addition of applied finishes.

1. Curing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

2.4 MISCELLANEOUS MATERIALS

A. Patching Mortar: Non-shrink, non-slump, non-metallic, quick setting.

1. Acceptable manufacturers and products:

a. Euclid Chemical Company - Eucospeed.
b. Master Builders Solutions - MasterEmaco N 424.
c. Adhesive Technologies. - Hard Rok Vertipatch.
d. W.R. Meadows - Speed Crete (Red Line).
e. Dayton Superior - Re-Crete 20 minute.
f. SpecChem - Precast Patch.

B. Cement Grout: Mix 1 part Ordinary Portland cementPortland limestone cement, 2-1/2 to 3 parts fine aggregate, and enough water for required consistency. Depending on use, consistency may range from mortar consistency to a mixture that will flow under its own weight. Do not mix more than the amount that can be used within 30 minutes. Retempering is not permitted. Use for leveling, preparing setting pads, beds, construction joints (with liquid bonding admixture) and similar uses. Do not use for grouting under bearing plates or structural members in place.

C. Dry-Pack: Mix 1 part Ordinary Portland cementPortland limestone cement, 2 parts fine aggregate, and enough water to hydrate cement and provide a mixture that can be molded with the hands into a stable ball (a stiff mix). Do not mix more than the amount that can be used within 30 minutes.

D. Expansion Joint Material: Preformed, resilient, non-extruding asphalt-impregnated fiber conforming to ASTM D1751. Thickness of expansion joint material shall be 1/2" unless noted otherwise on the drawings.

E. Vapor Retarder: not less than 10 mils thick, of one of the following materials:

1. Polyethylene sheet, ASTM D 4397.
2. Nonwoven, polyester-reinforced, polyethylene coated sheet.
3. Furnish adhesive back polyethylene tape.

2.5 STRENGTH AND PROPERTIES

A. Concrete Mix Designs: Refer to the drawings for specified compressive strength and other performance criteria. Proportion concrete mixes to meet design and performance requirements. The concrete supplier may produce a mix at a lower water-cement ratio to allow for adjustment of slump at the site by adding water. The addition of site water shall be in accordance with ASTM C94.

B. Slump of Superplasticized Concrete: Concrete containing high-range water reducing admixtures (superplasticizer) shall have 8" maximum slump, unless otherwise approved by Structural Engineer.

C. Accelerators: Add non-chloride accelerator to all concrete slabs placed at air temperatures below 50F only when approved in the mix design. Use of admixtures will not relax cold weather placement requirements.

D. Water Reducer: Add water reducing admixture or high range water reducing admixtures (superplasticizers) as follows:

1. All pumped concrete.
2. Fiber reinforced concrete.
3. As required for placement or workability.
4. As required by high temperatures, low humidity, or other adverse placement conditions.
5. Concrete with water-cementitious materials ratio below 0.50.

E. No other admixtures shall be used unless approved by Structural Engineer.

F. Chlorides: Admixtures or other ingredients including aggregates containing calcium chloride or more than 0.05% chloride ions by weight shall not be used.

G. Workability: Concrete shall have a workability such that it will fill the forms without voids, honeycombs, or rock pockets with proper vibration without permitting materials to separate or excess water to collect on the surface.

H. Concrete Temperatures: Minimum concrete temperature of fresh concrete varies in relation to average air temperature over a 24-hour period as follows:

1. Air temperature below 0F — Concrete temperature 70F min.
2. Air temperature 0F to 30F — Concrete temperature 65F min.
3. Air temperature 30F to 50F — Concrete temperature 50F min.
4. Air temperature above 50F — No minimum temperature
5. The maximum temperature of concrete at the time of delivery shall be 95F. When concrete temperature exceeds 95F, concrete supplier shall attempt to reduce temperature by shading aggregates and cement and cooling mix water. When these methods fail to reduce the concrete temperature below 95F, supplier shall use ice in the water to reduce the concrete temperature. Use set retarding admixtures only when approved in the mix design.

EXECUTION

3.1 PREPARATION

A. Verify requirements for concrete cover over reinforcement.

B. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

C. Do not place concrete until data on materials and mix designs have been approved, Architect has been notified, and all other affected trades have coordinated their work.

D. Remove snow, ice, frost, water, mud, and other foreign material from surfaces, reinforcing bars and embedded items against which concrete will be placed.

E. Prepare previously placed concrete by cleaning with sandblasting, steel brush, or water blast to expose aggregate to minimum 1/4" amplitude.

3.2 SLABS

A. Slab on Grade:

1. All interior slabs on grade shall have a polyethylene vapor retarder conforming to ASTM E1745. Lap all joints minimum 6" and seal edges with adhesive tape. Fit vapor retarder around utilities and seal with adhesive tape as required. Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions.
2. Where vapor retarder is not used below the slab on grade, wet sub-grade below slab prior to placing concrete. Subgrade shall be moist with no free water and no muddy or soft spots.
3. Saw cut control joints: Cut with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Control joints shall be located along column lines, with intermediate joints spaced at a maximum distance indicated on the drawings, unless noted otherwise. Control joints shall be continuous, not staggered or offset. Slab panels shall have a maximum length to width ratio of 1.5 to 1. Provide additional control joints at all reentrant or isolated corners formed in the slab on grade. Refer to the drawings for typical control joint detailing.
4. Provide isolation joints**against grade beams.**Form isolation joints with 1/2" expansion joint material. Extend isolation joint material full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
5. Verify completion of all under slab work with mechanical and electrical trades before placing slabs.
6. Slope slabs as indicated on the drawings and to provide positive drainage. Slope slab keeping bottom level and varying top. Maintain minimum thickness of concrete as indicated on the drawings. Refer to floor finishes for tolerances.

B. Embedded Items:

1. The outside diameter of embedded conduit or pipe shall not exceed one-third of the slab thickness in structural slabs, including at crossovers, and shall be placed between the top and bottom reinforcing with a minimum 3" clear cover. Conduit or pipe running parallel to each other shall be spaced at least 8" apart and no more than 2 runs stacked vertically in the slab. Conduit or pipe shall not be embedded in any supported slab less than 6" thick. No embedded conduit or pipe is allowed in any concrete slab-on-steel deck.

C. Reinforcing: Stop all welded wire reinforcement and/or reinforcing at construction joints in slabs on grade and provide dowel bars as detailed. Provide reinforcement at other construction joints as detailed. Roughen and thoroughly clean the surface of the concrete, remove all laitance, and wet the surface before placing new concrete against the joint

3.3 CONCRETE PLACEMENT

A. Place concrete as continuously as possible until placement is complete. Do not place against concrete that has attained initial set, except at authorized joints. If, for any reason, concrete pour is delayed for more than 45 minutes, bulkhead off pour at last acceptable construction joint. Immediately remove excess concrete and clean forms.

B. Do not begin to place concrete during periods of rain, sleet, or snow unless adequate protection is provided.

C. No concrete shall be cast onto or against sub-grades containing free water, frost, ice, or snow. If earth at bottom of forms has dried out, rewet so the soil is moist, but free of standing water and mud.

D. Notify the Architect in advance if concrete is to be pumped.

E. Do not place concrete until all reinforcement is in place, forms have been thoroughly cleaned and approval has been given.

F. Do not accept concrete delivered to the job site more than 90 minutes after initial mixing.

G. Concrete from its point of release to mixers, hoppers, or conveyances, shall not be permitted to drop more than 5 feet (10 feet for concrete containing high-range water reducers). Deposit concrete directly into conveyances and directly from conveyances to final points of deposit. Sufficient transportation equipment in good working order shall be on hand before work begins. All conveying equipment must be clean and kept clean during concreting operations. Take every possible precaution to prevent segregation or loss of ingredients.

H. Regulate rate of placement so concrete surface is kept level throughout; a minimum being permitted to flow from one area to another. Use tremie heads spaced at approximately 10-foot intervals for placing concrete in walls. Control rate of placement consistent with form design.

I. Deposit concrete in one continuous operation until section being placed has been completed. For slab thicknesses greater than 12 inches, prevent excessive segregation of aggregate and high temperatures in accordance with ACI 304 and ACI 308. Place concrete in wall forms in layers not greater than 12 inches in depth, each layer being compacted by internal vibration before succeeding layer is placed.

J. Place concrete as near as possible to its final position to prevent segregation or loss of materials. Do not use vibrators to transport concrete within forms. Consolidate concrete in walls, columns, beams, and slabs or joist construction thicker than 8" with internal vibrators (8,000 to 12,000 VPM). Slabs less than 8" thick may be consolidated with internal vibrators (9,000 to 13,500 VPM) or vibrating screeds supported on forms, boards, or rails, approved by the Structural Engineer, supplement vibration by forking or spading by hand along surfaces adjacent to forms and construction joints. Be sure an adequate number of operating vibrator units are on hand to properly consolidate quantity of concrete to be placed, including spares for emergency use.

1. Vertically insert and remove handheld vibrators at constant intervals 18 to 30 inches apart. Vibrate concrete the maximum amount and time required for complete consolidation, without segregation, and release of entrapped air bubbles, but in no instance exceed 15 seconds per square foot of exposed surface.

K. Re-tempering of concrete shall not be permitted. Concrete that has stood more than 15 minutes after leaving the mixer shall be discarded.

L. Exercise care in placing concrete over waterproof membranes, rigid insulation, and/or protection boards to avoid damaging those materials. Report damage immediately, and do not proceed until damage is repaired.

M. Remove loose debris from hardened surfaces of previous pours by sandblasting surfaces and expose clean coarse aggregate firmly embedded in cement matrix.

N. Protect existing concrete work to be exposed to view and other finished materials from damage and staining resulting from concreting operations. Handle concrete carefully to avoid dripping and spillage. Remove spilled concrete from existing surfaces immediately. Covering sills, ledges, and other surfaces with protective coverings may be necessary to protect the work.

O. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

P. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor rods for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

Q. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on the drawings. Screed, tamp, and trowel-finish concrete surfaces.

CONCRETE FINISHES AND TOLERANCES

A. Exposed Smooth Formed Surfaces: Remove forms and perform necessary repairs and patch to produce surface finish-3.0 as specified in ACI 301. Apply the following to smooth-formed finished concrete exposed to view in the finished work. Confirm finishes with the Architect prior to concrete placement by submitting shop drawings indicating locations of all types of finishes.

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.5 CONCRETE SLAB FINISHES AND TOLERANCES

A. Trowel Finish:

1. Screed concrete to an even plane, float, then power trowel the surface.
2. Hand trowel the surface smooth and free of trowel marks. Continue hand troweling until a ringing sound is produced as the floor is troweled.
3. Provide trowel finish as indicated on the drawings and at the following locations:

    a. Concrete floors exposed in finished work unless otherwise indicated.
    b. Slabs to receive curing compounds and sealers.
    c. Slabs to receive resilient flooring or carpet.

B. Fine Broom Finish:

1. Screed concrete to an even plane, float, then power trowel the surface. Provide fine hair broom finish perpendicular to slope, free of loose particles, ridges, projections, voids, and concrete droppings.
2. Provide fine broom finish as indicated on the drawings and at the following locations:

    a. Stoop slabs.
    b. Raised curbs and walkway areas.
    c. Slabs to receive thin set ceramic tile.
    d. Exterior equipment pads

C. Broom Finish:

1. Screed concrete to an even plane and then float. Immediately after concrete has received a floated finish, give the concrete surface a coarse transverse scored texture by drawing a coarse broom across the surface.
2. Provide as indicated on the drawings and at the following locations:

    a. ADA ramp slabs.
    b. Exterior walkway slabs.

D. Floor Finish Tolerances: Floor finish tolerances shall be measured by placing a freestanding (unleveled) 10-foot straightedge anywhere on the slab and allowing it to rest upon two high spots within 72 hours after placement of slab and removal of shoring (if present). The gap at any point between the straightedge and the floor (and between the high spots) shall not exceed:

1. Slab on Grade : 1/4"

E. Slab Drainage: Finish all concrete slabs to proper elevations to ensure that all surface moisture will drain freely to floor drains, and that no puddle areas exist. Contractor shall bear the cost of corrections to provide positive drainage.

F. Special Tolerances for Concrete Slabs: No abrupt change in vertical elevation of 1/4" or more is acceptable at the interface between slabs and within areas where pedestrian traffic is expected.

3.6 CONCRETE CURING

A. Freshly placed concrete shall be protected from premature drying and excessively hot temperatures.

B. Concrete other than high-early strength shall be maintained above 50F and in a moist condition for at least the first 7 days after placement, except when special curing is used. Special curing procedures shall not be used without written permission from the Structural Engineer.

C. Formed surfaces shall be cured by leaving the formwork in place during the curing period.

D. Protect concrete from excessive changes in temperature during the curing period and at the termination of the curing process. Changes in the temperature of the concrete shall be as uniform as possible and shall not exceed 5F in any one hour or 50F in any 24-hour period.

E. Protect concrete from injury from the elements until full strength is developed. Protect from mechanical injury.

F. During cold weather construction, all concrete shall be protected from frost penetration until the building is enclosed and temporary heat is provided.

3.7 SLAB CURING

A. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Use one of the methods described below.

B. Moisture-Retaining-Cover Curing for Concrete Floors Not Exposed in Final Condition: Cover concrete surface with waterproof sheet material as soon as finishing operations are complete and the concrete is sufficiently hard to be undamaged by covering. The cover shall be placed flat on the concrete surface, avoiding wrinkles. Sprinkle concrete with water as necessary during application of covering. Place in widest practicable width, with sides and ends lapped at least 12 inches, and seal with waterproof tape or adhesive. Verify the concrete is continuously wet under the sheets; otherwise, add water through soaker hoses under the sheets. Weight down covering to prevent displacement. Immediately repair any holes or tears during the curing period using polyethylene sheet and waterproof tape. Curing process shall be maintained for a minimum of 7 days.

C. Moisture-Retaining-Fabric Curing for Concrete Floors to Remain Exposed: Cover concrete surface with moisture retaining fabric as soon as finishing operations are complete and the concrete is sufficiently hard to be undamaged by covering. The cover shall be installed in accordance with the manufacturer's written recommendations, in largest practical widths. Wet the slab to rejection, then thoroughly wet fabric side of cover and install with poly side up. Lap over adjacent covers a minimum of 18". Wet all laps and outside edges to prevent displacement and to ensure intimate contact with concrete and adjacent covers. Rewet as necessary and protect covers from damage during curing process.

1. After minimum 7-day cure, remove moisture retaining fabric in sections.
2. A maximum of 3,500 square feet of concrete curing cover may be removed at any one time. At no time shall the exposed area be permitted to dry prior to completion of the floor scrubbing process.
3. Using a high-powered floor scrubber capable of a minimum 80 pounds head pressure, and a mild citrus-based detergent that does not damage or mar the surface in any way, scrub the floor to remove any minerals or soluble salts that may have accumulated at the floor surface. Rinse area thoroughly with clean fresh water. Remove water and allow floor to dry. If whitening occurs during drying, repeat scrubbing process before floor dries until no whitening occurs during drying.
4. All areas of the floor shall remain wet during floor scrubbing process. Expose only the amount of floor surface that can be cleaned before any drying occurs without exceeding the maximum allowable exposed area.

D. Curing Compound: Apply uniformly in continuous operation by low pressure spray equipment or roller as soon as finishing operations are complete, free water on the surface has disappeared, and no water sheen can be seen. Follow the manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. Verify compatibility of the curing compound with paint, finishes, or toppings that require positive bond to the concrete. If curing compound is not compatible with paint finishes or toppings, utilize a dissipating curing compound and remove in accordance with the manufacturer's recommendations.

3.8 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Do not fill joints until construction traffic has permanently ceased.

C. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.9 COLD WEATHER CONCRETING

A. Definition: Cold weather shall be defined as a period when for more than three successive days the average daily outdoor temperature drops below 40F. The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight. When temperatures above 50F occur during more than half of any 24-hour duration, the period shall not be regarded as cold weather.

B. All cast-in-place concrete work occurring during cold weather shall conform to all requirements of ACI 306.1, "Standard Specification for Cold Weather Concreting", published by the American Concrete Institute, Detroit, Michigan, except as modified by the contract documents or this specification.

C. Planning: The **General Contractor, concrete contractor,** and **concrete supplier** shall have a pre-construction conference to outline the cold weather concreting operations concerning the placing, finishing, curing and protection of the concrete during cold weather. Pre-construction conference shall occur before cold weather is expected to occur.

D. Mixing: Concrete flatwork poured in cold weather shall be proportioned to obtain a lower slump to minimize the amount of bleed water during finishing. All bleed water should be skimmed off flatwork prior to troweling. Concrete that will be exposed to cycles of freezing and thawing while saturated should be properly air entrained as outlined in this specification.

E. Protection of Concrete: Cure and protect concrete against damage from freezing for a minimum period of 72 hours, unless approved by the Structural Engineer. The protection period may be reduced according to ACI 306.1 requirements. Concrete contractor shall submit a letter of request to reduce the protection period, by outlining the method used to achieve the reduction per ACI 306.1.

3.10 FIELD QUALITY ASSURANCE

A. Independent Testing Agency and **Special** Inspector shall each perform their prescribed inspection, sampling, and testing services as described in Part 1 of this specification section.

B. In cases where samples have not been taken or tests conducted as specified or strength of laboratory test cylinders for a particular portion of the structure fails to meet requirements of ACI 301, for evaluation of concrete strength, Structural Engineer shall have the right to order compressive or flexural test specimens or both be taken from the hardened concrete according to ASTM C42, load tests according to ACI 318, or such other tests as may be necessary to clearly establish the strength of the in situ concrete, and such tests shall be paid for by the Contractor. Where cores have been cut from the Work, Contractor shall fill voids with dry-pack and patch the finish to match the adjacent existing surfaces.

3.11 REPAIR OF DEFECTIVE AREAS

A. All repair of defective areas shall be made, with prior approval of Architect and Structural Engineer as to method and procedure, in accordance with Section 5 of ACI 301, except specified bonding compound must be used. Cosmetic repairs of minor defects in exposed concrete surfaces shall be in a manner acceptable to the Architect. Defective areas shall be deemed when:

1. Tests on core or prism specimens fail to show specified strengths.
2. Not formed as indicated or detailed.
3. Not plumb or level where so indicated or required to receive subsequent work.
4. Not true to intended grades and levels.
5. Cut, filled, or resurfaced, unless under direction of the Structural Engineer.
6. Debris is embedded therein.
7. Not fully in conformance with provisions of the drawings.
8. Damaged by hot or cold weather conditions.
9. Mixing time exceeds 90 minutes from ready-mix plant to the time of deposit.

B. Patch form tie holes at the following locations:

1. Unfinished exposed concrete (not scheduled for painting, plus at board formed concrete finish).

C. All structural repairs shall be made, with prior approval of the Architect/Engineer, as to method and procedure, using the specified epoxy adhesive and/or epoxy mortar.

D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white Ordinary Portland cementPortland limestone cement and standard Ordinary Portland cementPortland limestone cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

3.12 CLEANING

A. Clean exposed concrete to remove laitance, efflorescence and stains.

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SECTION 03 35 11
CONCRETE FLOOR FINISHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid densifiers and hardeners.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

B. Section 03 30 00 - Cast-in-Place Concrete: Curing compounds for new concrete that also function as sealers.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with concrete floor placement and concrete floor curing.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

C. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of experience.

B. Flooring supplier shall approve concrete mix additives, topical treatments and curing methods prior to concrete placement.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

B. Comply with manufacturer's written storage instructions.

C. Comply with manufacturer's written handling instructions prior to mixing.

1.07 FIELD CONDITIONS

A. Maintain light level equivalent to a minimum 200 W light source at 8 feet above the floor surface over each 20 foot square area of floor being finished.

B. Do not finish floors until interior heating system is operational.

C. Maintain ambient temperature of 50 degrees F minimum.

PART 2 PRODUCTS

2.01 CONCRETE FLOOR FINISH APPLICATIONS

A. Liquid Densifier and Hardener:
   1. Use at following locations: All areas of exposed interior concrete.

2.02 DENSIFIERS AND HARDENERS

A. Liquid Densifier/Hardener: Penetrating chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set.
   1. Composition: silicate and siliconate polymers.
   2. Products:
      a. CureCrete; Ashford Formula; www.ashfordformula.com
      b. Euclid Chemical Companhy; EucoDiamond Hard; www.euclidchemical.com
      c. PROSOCO, Inc; Consolideck LS/CS: www.prosoco.com/consolideck/#sle.
      d. Sinak Corporation; LithoHard: www.sinak.com/#sle.

e. Silex System; Silex Hard, Silex Hydro-Hard: www.silexsystem.com
f. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

3.02 GENERAL

A. Apply materials in accordance with manufacturer's instructions.

3.03 COATING APPLICATION

A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.

B. Verify that water vapor emission from concrete and relative humidity in concrete are within limits established by coating manufacturer.

C. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

D. Apply coatings in accordance with manufacturer's instructions, matching approved mock-ups for color, special effects, sealing and workmanship.

END OF SECTION

SECTION 03 41 00
STRUCTURAL PRECAST CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Engineering, fabrication, and erection of structural precast concrete units. Work shall include, but not be limited to, the following items:
   1. Precast Hollow Core Slab Sections

B. Work shall also include **headers for openings, connections, and grouting of precast units**.

C. Structural notes indicated on the drawings regarding structural precast concrete shall be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 20 00 - Concrete Reinforcement.

C. Section 03 30 00 - Cast-in-Place Concrete.

D. Section 04 22 00 - Reinforced Unit Masonry.

E. Section 05 12 23 - Structural Steel.

F. Section 05 21 00 - Steel Joists.

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

   1. .
   2. ACI 301 - Specifications for Structural Concrete.
   3. ACI 318 - Building Code Requirements for Structural Concrete.
   4. ASTM A36 - Standard Specification for Carbon Structural Steel.
   5. ASTM A416 - Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete.
   6. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   7. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
   8. ASTM C33 - Standard Specification for Concrete Aggregates.
   9. ASTM C150 - Standard Specification for Portland Cement.
   10. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
   11. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
   12. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

13. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
14. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
15. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
16. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
17. AWS D1.1 - Structural Welding Code - Steel.
18. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
19. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.
20. PCI MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
21. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
22. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete.
23. PCI MNL-123 - Connections Manual - Design and Typical Details of Connections for Precast and Prestressed Concrete.
24. PCI MNL-124 - Design for Fire Resistance of Precast/Prestressed Concrete.
25. PCI MNL-126 - PCI Manual for the Design of Hollow Core Slabs and Walls.
26. PCI MNL-127 - Erector's Manual - Standards and Guidelines for the Erection of Precast Concrete Products.
27. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction.

1.4 QUALITY ASSURANCE

A. Fabrication, Erection and Welding:

1. Fabricate and perform testing of precast units in accordance with **PCI MNL-116 and PCI MNL-117**.

The precast concrete manufacturer shall be certified by the Precast Concrete Institute (PCI) Certification Program prior to the start of production.

3. The precast concrete manufacturer shall have production capacity to produce required units without causing delay in work.
4. Welding: All welding of structural steel shall be performed by operators who have been qualified within the past year as prescribed in "Qualification Procedures" of the American Welding Society (AWS).

B. Design:

1. Precast units and their connections shall be designed by a licensed, qualified **Professional** engineer licensed in the State were the project is located, to withstand the loadings and criteria indicated on the drawings and contained within this section.

C. Fire Ratings:

1. Precast units shall be designed to meet the project fire ratings as specified by the Architect and as indicated on the drawings.

1.5 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's reviewl, including but not limited to the following:

a. Member piece marks and completely dimensioned size, shape, and type of each member.
b. Plans and/or elevations locating and defining all products furnished by the manufacturer. Indicate separate face and backup mix locations plus thicknesses and indicate the limits of each finish.
c. Sections and details showing connections, cast-in items, and their relation to the structure.
d. Methods of connecting, anchoring, fastening, bracing, and attaching work of other trades.
e. Indicate welded connections by AWS standard symbols.
f. Indicate size and location of openings, either saw-cut or formed, to be coordinated with other trades.
g. Joints and openings in units and between units and the structure.
h. Description of all loose, cast-in and field hardware.
i. Headers required for openings.
j. Estimated camber at erection.

2. Manufacturer shall submit the shop drawings showing **roof member** layout to the Mechanical Contractor for review of openings and inserts required by mechanical components.

B. Qualification Data:

1. When requested by the Architect, provide lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Design Calculations:

1. Prepare and submit one complete set of signed and sealed structural calculations to the Architect/Engineer for reviewl of each unique and distinct precast member and precast connection prepared and certified by a **Professional** Engineer licensed in the State where the project is located. Architect/Engineer's reviewl or acceptance of the manufacturer's design calculations shall in no way relieve the manufacturer of the full responsibility for the correctness of the calculations or the structural performance of the completed members or sections.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Precast units shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Precast units shall be lifted and supported during manufacturing, stock-piling, transporting and erection operations only at the lifting and/or supporting points shown on the approved shop drawings.

B. Store units at the project site in such a manner to prevent cracking, distortion, staining, or other physical damage, and so that markings are visible. Protect edges of precast units from chipping or spalling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete Materials:

1. Refer to Section 03 30 00, Cast-in-Place Concrete, for additional information and requirements for concrete, formwork, materials application, admixtures, accessories, etc.
2. Portland Cement: ASTM C150, Type I or III, gray and white.
    a. Standard gray Portland cement may be used for non-exposed backup concrete.
3. Portland Limestone Cement: ASTM C595, Type IL.
    a. Standard Portland limestone cement may be used for non-exposed backup concrete.
    b. Portland limestone cement is preferred instead of Portland cement where available.
4. Normal-Weight Aggregates: ASTM C33
    a. Face-Mix Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining.
    b. Face-Mix Fine Aggregates: Selected, natural or manufactured sand of the same material as coarse aggregate, unless otherwise approved by the Architect.
5. Admixtures - As determined by the precast manufacturer, but conforming to:
    a. Air-entraining Admixtures: ASTM C260.
    b. Chemical Admixtures: ASTM C494.
    c. Fly Ash: ASTM C618, Class C or F.
    d. Silica Fume: ASTM C1240.
6. Water - Potable and free from foreign materials in amounts harmful to concrete and embedded steel.

B. Anchors, Inserts and Connection Material:

1. Steel Plates and Shapes - ASTM A36.
2. Anchor Rods - ASTM F1554.
3. Deformed Bar Anchors - ASTM A496.
4. Steel Headed Studs - AWS D1.1, Type B.
5. High-Strength Bolts - ASTM F3125, Grade A325.
6. Welding Electrodes - Comply with AWS standards.

C. Grout:

1. Cement Grout - Portland cement, ASTM C150, Type I, and clean, natural sand, ASTM C144. Mix at a ratio of 1.0 part cement to 2.5 parts sand, by volume, with minimum water required for placement and hydration. Minimum compressive strength to be **3000 psi**.
2. Non-metallic, non-shrink grout - Grout shall be a pre-mixed, non-metallic, non-corrosive, non-staining product, containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents, and complying with ASTM C1107. Minimum compressive strength to be **7,000** psi at 28 days.

D. Bearing Pads: Manufacturer to choose one of the following.

1. Elastomeric Pads: AASHTO M251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, 50 to 70 Shore A durometer, minimum tensile strength 2250 psi per ASTM D412.
2. Random-Oriented, Fiber-Reinforced Elastomeric Pads: Preformed, randomly oriented synthetic fibers set in elastomer. Surface hardness of 70 to 90 Shore A durometer.
3. Cotton-Duck-Fabric-Reinforced Elastomeric Pads: Preformed, horizontally layered cotton-duck fabric bonded to an elastomer. Surface hardness of 80 to 100 Shore A durometer.
4. Hardboard: AHA A135.4, Class 1, tempered hardboard strips, smooth on both sides.
5. High-Density Plastic: Multimonomer, non-leaching, plastic strip.

2.2 CONCRETE MIXES

A. Concrete shall achieve a minimum 28-day compressive strength of **5000** psi.

2.3 FABRICATION AND MANUFACTURER

A. Fabricate precast member in plastic lined or metal forms which are true to line and plane. Form openings of 100 square inches in area.

1. Edge and Corner Treatment: Uniformly chamfered.

B. Contractor shall identify opening locations to precast manufacturer for coordination and shall provide precaster with cast-in items required by other trades.

C. Manufacture units in compliance with **PCI MNL-116 and PCI MNL-117**. Comply with the tolerances specified in **PCI MNL-116 and PCI MNL-117.**

D. Precast **hollow core slabs** shall have end bearings lengths as indicated on the structural drawings, but at least 6 inches minimum.

E. Clean reinforcement of loose rust, mill scale, and other materials, which may reduce or destroy bond with concrete.

F. Place reinforcement to obtain at least the minimum coverage for concrete protection as specified by ACI-318. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

G. Install welded wire reinforcement in longest lengths practical. Lap adjoining pieces one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

H. Cast in structural inserts, plates and accessories as indicated on the drawings and as determined by the fabricator for erection and anchorage

I. Provide cast-in-place or structural steel headers for openings larger than one slab width according to fabricator's written recommendations.

J. Finishes, unless otherwise indicated on the drawings, provide:

1. Precast **hollow core slabs**:

a. Standard underside - As resulting from casting against approved forms. Small surface holes, normal color variations, normal joint marks, minor chips, and spalls will be tolerated. Major imperfections, honeycombs, structural defects, or other defects will not be tolerated.
b. Standard topside - As resulting from vibrating screed and additional hand finishing at projections. Normal color variations, normal joint marks, minor chips and spalls will be tolerated. Provide surface roughend to an amplitude of ¼ inch. Provided embedded tie reinforcement as shown on drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which Work is to be performed and notify the General Contractor in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.2 ERECTION

A. The Contractor shall be responsible for:

1. Providing suitable access to the site, proper drainage, and firm, level bearing for the hauling and erection equipment to operate under their own power.
2. At time of delivery, provide area inside and outside the building to allow adequate maneuverability for erection procedures.
3. Placement and accurate alignment of walls walls, ledge angles and other field placed support units.
4. Provide all shoring and bracing required by manufacturer's recommendations and as indicated on the precast shop drawings.

B. Install bearing pads on true, level, and uniform bearing surfaces. Maintain the correct position of the pads until precast units are in place.

C. Locate lifting hooks as specified on the shop drawings.

D. Erect units in compliance with PCI MNL-127.

E. Shore and brace precast units to maintain location, stability, and alignment until permanent connections are established.

F. Precast units shall be properly aligned and leveled as required by the shop drawings.

G. Repair damaged metal surfaces by cleaning and applying a coat of galvanizing repair paint to galvanized surfaces or repainting damaged surfaces. Damage to those surfaces having special finishes as specified shall be brought to the attention of the Architect.

H. Required openings less than 8 inches square or 8 inches in diameter in precast **slab** units shall be field cut. No openings shall be cut so as to pass through the leg sections of the prestressed units. Holes cut in slabs not concealed by finished ceiling systems shall be cut through, starting on underside with hand or mechanical chisels or from top only with core type drills. Restrict openings to as small as possible.

I. Use flowable cement grout to grout keyways between hollow core slabs as follows:

1. Clean and prepare keyways to be filled. Joints should be free of debris and dust.
2. Seal underside of slab joints to prevent grout leakage.
3. Fill grout keys full and strike flush with top surface.
4. Remove grout that seeps through to ceiling below before grout hardens.
5. Remove grout from top surface that would interfere with bonding of topping.

J. Use non-metallic, non-shrink grout at wall panels and columns where required by the precast manufacturer's shop drawings. Retain grout in place until hard enough to support itself. Pack spaces with stiff grout until all voids are filled and flush with adjacent surfaces. Keep grouted joints damp for not less than 24 hours after initial set. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Grouting shall follow closely behind the erection of precast wall panels and columns.

K. Welding: Comply with AWS D1.1 and AWS D1.4

1. Protect precast concrete units and bearing pads from damage by field welding or cutting, and provide noncombustible shields as required.

L. Installation and caulking of the precast units shall be supplied by the precast manufacturer.

M. Field Touchup:

1. Immediately after erection, field welding and/or final bolting, clean exposed surfaces of precast concrete units after erection to remove weld marks, other markings, dirt and stains.

3.3 FIELD QUALITY CONTROL

A. The contractor may choose to employ a separate testing laboratory to evaluate the precast manufacturer's quality control and testing methods. If requested, the precast manufacturer shall allow the Owner's testing company access to the manufacturing facility and provide samples of material for additional evaluation.

B. Precast units which do not conform to specified requirements, including strength, tolerances, and finishes, or which are damaged during handling and erection, shall be replaced with precast concrete units that meet the requirements of this specification.

C. The contractor shall be responsible for the cost of corrections to other work affected by or resulting from corrections to precast concrete work.

D. Precast units having dimensions greater than required will be rejected if appearance or function of the structure is adversely affected, or if larger dimensions interfere with other construction. The contractor shall be responsible for the cost of necessary repair, removal, and replacement of rejected units.

E. The precast supplier shall inspect all field cutting, which cuts reinforcing. The precast manufacturer shall issue a letter to the Owner either accepting the system as modified or directing corrective procedures to offset cut reinforcing. The contractor shall be responsible for the cost of any corrective procedures.

F. Clean all exposed surfaces after erection to remove weld marks, other markings, stains, and dirt. Wash and rinse according to manufacturer's recommendations. Protect other work from damage or staining during cleaning operations.

END OF SECTION

SECTION 03 54 00
CAST UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cementitious floor patching and leveling products used reestablish a flat, smooth substrate where existing floor finishes are removed and replaced with new floor finishes.

1.02 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2026.

B. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2021.

C. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, environmental limitations, and installation instructions.

C. Manufacturer's Instructions.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.05 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.

C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cementitious Underlayment:
   1. ARDEX Engineered Cements; ARDEX V 1200 with ARDEX P51 Primer; ARDEX FEATHER FINISH: www.ardexamericas.com/#sle.
   2. Custom Building Products; CL-150 Self-Leveling Underlayment: www.custombuildingproducts.com/#sle.
   3. LATICRETE International, Inc; LATICRETE NXT Level Plus with NXT Primer, 86 Latilevel™: www.laticrete.com/#sle.
   4. Maxxon Corporation; Maxxon Commercial Level EZ: www.maxxon.com/#sle.
   5. USG; Durock Quik-Top Self-Leveling Underlayment: www.usg.com/#sle.
   6. W. R. Meadows, Inc; Floor-Top STG, MEADOW-PATCH T2: www.wrmeadows.com/#sle.

2.02 MATERIALS

A. Cast Underlayments, General:
   1. Comply with applicable code for combustibility or flame spread requirements.
   2. Provide certificate of compliance from authority having jurisdiction indicating approval of underlayment materials in the required fire rated assembly.

B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1. Compressive Strength: Minimum 5000 pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
   3. Density: 125 pounds per cubic foot, nominal.
   4. Final Set Time: 1-1/2 to 2 hours, maximum.
   5. Thickness: Capable of thicknesses from feather edge to maximum 1-1/2 inch.
   6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

C. Reinforcement: Galvanized metal lath complying with recommendations of underlayment manufacturer for specific project circumstances.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.

E. Primer: Manufacturer's recommended type.

F. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

G. Sound Control Mat: Sheet material, perimeter isolation strip, and tape; as recommended by the underlayment manufacturer.

2.03 MIXING

A. Site mix materials in accordance with manufacturer's instructions.

B. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.02 PREPARATION

A. Wood: Install metal lath for reinforcement of underlayment.

B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

C. Vacuum clean surfaces.

D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

E. Close floor openings.

3.03 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Pump or pour material onto substrate. Do not retemper or add water.
   1. Pump, move, and screed while the material is still highly flowable.
   2. Be careful not to create cold joints.
   3. Wear spiked shoes while working in the wet material to avoid leaving marks.

C. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.

D. Place before partition installation.

E. If a fine, feathered edge is desired, steel trowel the edge after initial set, but before it is completely hard.

3.04 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.05 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

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SECTION 04 20 00
UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fabrication and installation of masonry units. Work shall include, but not be limited to, the following items:

1. Concrete masonry units.
2. Split faced masonry units.
3. Decorative stone masonry.
4. All wall reinforcement, anchorage, insulation, lintels, and accessories.
5. Mortar for masonry including admixtures.
6. Grout for masonry.
7. Form control joints.
8. Built-in items supplied by other trades.

B. Products furnished but not installed under this section.

1. Dovetail anchors embedded in concrete work.
2. Adjustable masonry anchors connecting to structural steel.
3. Flashing reglets embedded in concrete work.

C. Products installed but not furnished under this section.

1. Placement of special anchorage for precast concrete installation.
2. Placement of loose steel lintels.
3. Placement of fabricated steel items.
4. Placement of reglets for flashing.
5. Placement of window and door frame anchors.

D. Structural notes indicated on the drawings regarding unit masonry shall be considered part of this specification.

1.2 RELATED WORK

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 05 12 23 - Structural Steel.

C. Section 05 21 00 - Steel Joists.

D. Section 31 23 00 - Foundation Excavating and Backfilling.

E. Section 04 26 13 – Masonry Veneer

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where any provision of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM A36 - Standard Specification for Carbon Structural Steel.
4. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
5. ASTM A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
6. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
7. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
8. ASTM A951 - Standard Specification for Steel Wire for Masonry Joint Reinforcement.
9. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
10. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
11. ASTM C91 - Standard Specification for Masonry Cement.
12. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
13. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
14. ASTM C150 - Standard Specification for Portland Cement.
15. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
16. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
17. ASTM C387 - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar.
18. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
19. ASTM C476 - Standard Specification for Grout for Masonry.
20. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
21. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
22. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
23. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
24. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
25. NCMA - National Concrete Masonry Association.
26. TMS 402/602 - Building Code Requirements and Specifications for Masonry Structures.
27. UL - Underwriters Laboratories.

1.4 QUALITY ASSURANCE

A. Company: Company shall have experience in the construction of masonry projects of similar scope and complexity.

B. For the actual cutting and placing of concrete masonry units, use only skilled masons who are thoroughly experienced with the material and methods specified and thoroughly familiar with the design requirements.

C. Fire Resistance: Whenever a fire-resistant classification is indicated for unit masonry construction, provide concrete block units as tested and listed for the particular fire-resistant construction.

D. The governing building department reserves the right to take samples and make material tests prior to or during construction, without expense to the Contractor. Materials found to be defective shall be removed and replaced.

1.5 SUBMITTALS

A. Prepare and submit product data for the Architect/Engineer's approval. Data should include all horizontal reinforcement, anchoring devices, and all other embedded items herein specified.

B. Prepare and submit shop drawings detailing the fabrication, bending, and placement of reinforcing bars.

C. Submit manufacturer's recommendations and product data for the following items:

1. Admixtures.
2. Horizontal joint reinforcing.

D. Samples: Submit not less than five individual masonry unit samples for verification of the following:

1. Full size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected during construction.
2. Colored masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar mix specified for this project.

E. Certificates:

1. Prior to delivery, submit to the Architect/Engineer a certificate or letter certifying products supplied for this project comply with the requirements of this specification.

F. Submit mortar mix design and test results as follows:

1. Mix designs shall indicate typeof ingredients in compliance with the property requirements of ASTM C270.

G. Submit grout mix designs and test results as follows:

1. Mix designs shall indicate type and proportions of the ingredients in compliance with the property requirements of ASTM C476.

1.6 MOCK-UP

A. Prior to installation, Contractor shall erect a four-foot long by four-foot-high sample wall panel to verify selection made under sample submittals and to demonstrate aesthetic effects of materials and quality of workmanship expected throughout construction.

B. Erect panel in presence of Architect prior to installation of material.

C. Provide a separate panel for each type of face material and mortar.

D. Do not start work until the Architect has given written acceptance of sample panels.

E. Accepted mock-up will demonstrate minimum standard for workmanship required for the entire project's masonry construction.

F. Construct mock-up panels for the following walls:
   1. Exterior masonry wall construction.

G. Demolish and remove mock-ups from site when directed by the Architect/Engineer.

H. Mock-up may not remain as part of the project construction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver all materials in sufficient quantity and time to maintain approved construction schedule.

B. Deliver all packaged materials in manufacturer's original containers, with labels and markings intact and legible.

C. Immediately remove all damaged materials or container from site and replace with new items.

D. Store all items in a secure, dry location, out of the way of construction operations. Store materials on pallets a minimum 4" off the ground to prevent deterioration from moisture and contaminants.

E. All items shall be transported, stored, and erected in a manner that will avoid any further damage or deformation. Bent or deformed items will be rejected and shall be replaced or repaired at the expense of the responsible party.

F. Masonry accessories, including reinforcing steel, shall be stored clear of the ground to prevent deterioration or damage due to moisture, temperature changes, contaminants, and corrosion.

PART 2 - PRODUCTS

2.1 MASONRY

A. Hollow Load Bearing Concrete Masonry Units: ASTM C90 as follows:

   1. Weight: Normal weight
   2. Compressive Strength: As indicated on the drawings.
   3. Nominal Size: As indicated on the drawings.
   4. Actual Size: 3/8" less than nominal size.
   5. Aggregates: Conform to ASTM C33 for normal weight.
   6. Exposed Face: Manufacturer's standard color and texture unless noted otherwise.
   7. Provide special units, including bull noses, for 90-degree corners, lintels, jambs, sash, control joints, headers, bond beams, and other conditions conforming to ASTM C90.

2.2 MORTAR AND GROUT

A. Mortar type for masonry construction shall be as designated in the General Notes of the drawings, conforming to ASTM C270, and grout shall conform to ASTM C476 and as follows:

   1. Compressive Strength: As indicated on the drawings.

2. Portland Cement: ASTM C150, Type I non-staining, no air entrainment, natural color cement.
3. Blend Cement: ASTM C595.

4. Hydrated Lime: ASTM C207.
5. Water: Clean, free from injurious amounts of oil, alkali, organic matter, or other deleterious material.
6. Cold Weather Admixtures: ASTM C494, non-chloride, non-corrosive, accelerating type recommended by the manufacturer for use in masonry mortar of composition indicated.
7. Do not use calcium chloride in mortar or grout.

B. Pigmented Mortar: Select and portion pigments with other ingredients to produce the required color.

1. Limit mineral oxide pigments to only 10 percent of the Portland cement-lime mortar mix.
2. Manufacturers:

a. Davis Colors.
b. Lafarge Corporation.
c. L.M. Scofield.

2.3 STEEL REINFORCEMENT

A. Reinforcing Steel: ASTM A615, Grade 60, deformed billet sizes as indicated on the drawings.

2.4 JOINT REINFORCEMENT

A. Joint reinforcement shall be formed from galvanized carbon steel wire in accordance with ASTM A641, Class 1 for interior walls, and ASTM A153, Class B-2 for exterior walls.

B. Welded wire units shall have minimum 9 gauge deformed continuous side rods and minimum 9 gauge plain cross rods. The overall unit width shall be 1-1/2" to 2" less than the wall thickness. Prefabricate into small lengths not less than 10 feet with matching corners and tees.

C. For single wythe masonry, provide truss type reinforcement.

D. For multi-wythe construction, provide truss type reinforcement, which has one side rod for each face shell of hollow masonry units more than 4 inches in width, plus one side rod for each wythe of masonry 4 inches in width.

E. Adjustable Tab Design: Single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches on center, with side rods spaced for embedment within each face shell of the back-up wythe and with separate adjustable ties engaging the cross ties and extending to engage the outer wythe by at least 1-1/2 inches and spaced not more than 16 inches on center. Use where horizontal joints of facing wythe do not align with the back-up wythe or where the facing wythe is of different material than back-up wythe.

2.5 WIRE TIES AND ANCHORS

A. Provide wire ties and anchors as required for the wall construction indicated on the drawings which comply with the following:

1. Exterior Walls: Galvanized carbon steel wire conforming to ASTM A153, Class B-2 coating.

2. Interior Walls: Galvanized carbon steel wire conforming to ASTM A641, Class 1 coating.

2.6 ADJUSTABLE ANCHORS FOR CONNECTING TO STRUCTURAL FRAME

A. Provide two-piece assemblies that allow vertical or horizontal movement between the masonry wall and the structural frame but resist the tension and compression forces applied perpendicular to it.

B. Provide manufacturer's standard anchors with crimped 1/4-inch diameter wire anchor section for welding to steel and the triangular shaped 1/4-inch diameter wire tie section sized to extend within 1 inch of the masonry face.

2.7 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2 cup dry measure tetrasodium polyphosphate (Spic and Span), and 1/2 cup dry measure laundry detergent dissolved in one gallon of water.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Bond Breaker Strips: Asphalt saturated organic roofing felt complying with ASTM D226, Type 1, 15 lbs. felt.

B. Pre-molded Control Joint Strips: Styrene-Butadiene rubber compound conforming to ASTM D2000, Designation M2AA-805. Designed to fit a standard sash block and to maintain lateral stability in masonry walls.

C. Compressible Filler: Pre-molded filler strips complying with ASTM D1056, Type 2, Class A, Grade 1; compressible up to 35 percent. Provide widths and thicknesses as indicated on the drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive work.

1. Verify foundations are constructed with tolerances conforming to the requirements of ACI 117.
2. Verify reinforcing dowels are positioned in accordance with the drawings.

B. Verify items provided by other Sections of work are properly sized and located.

C. Verify built-in items are properly located and ready for roughing into masonry work.

D. Beginning of installation means Installer accepts existing conditions.

3.2 PREPARATION

A. Lay out walls in advance for accurate spacing of bond patterns, with uniform joint widths and properly located openings, expansion joints, and offsets.

B. Direct and coordinate placement of metal anchors supplied to other trades for their installation when required.

C. Install metal anchors other than those required to be installed by other trades.

D. The Contractor is responsible to design, provide, and install bracing that will ensure stability of masonry during construction. Maintain until building structure provides permanent bracing.

E. Ensure items built-in by other trades for this work are properly located and sized.

3.3 COURSING

A. Establish lines, levels, and coursing. Protect survey lines from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in **running** bond pattern. Course one unit and one mortar joint to equal 8 inches. Form **concave** mortar joints.

3.4 MORTAR MIX

A. Thoroughly mix mortar ingredients in quantities needed for immediate use.

B. Use mortar within two hours of mixing at temperatures over 80F and 2-1/2 hours at temperatures under 50F.

C. If necessary, re-temper mortar within two hours of mixing to replace water lost by evaporation. Do not re-temper after two hours of mixing.

3.5 GROUT

A. Thoroughly mix grout ingredients in quantities needed for immediate use. Place grout within 1-1/2 hours from introducing water to the mixture and prior to the initial set. Retempered grout is not allowed.

B. Do not use anti-freeze compounds to lower the freezing point of grout.

C. Do not use admixtures in grout.

3.6 COLD-WEATHER CONSTRUCTION

A. When ambient temperature is below 40F, implement cold weather procedures.

B. Special cold weather requirements for various temperature ranges are as follows:

1. Air temperature 40F to 32F: Sand or mixing water shall be heated to produce mortar temperatures between 40F to 120F.
2. Air temperature 32F to 25F:

    a. Sand and mixing water shall be heated to produce mortar temperatures between 40F to 120F. Maintain temperature of mortar on boards above freezing.
    b. Grout aggregates and mixing water shall be heated to produce grout temperature between 70F to 120F.

3. Air temperature 25F to 20F: Comply with requirements for air temperature between 32F to 25F and the following:

a. Provide heat sources on both sides of the wall under construction to heat masonry surfaces to 40F. Windbreaks shall be used when wind is in excess of 15 miles per hour.
b. Heat masonry to a minimum temperature of 40F prior to grouting.

4. Air temperature 20F below. Comply with requirements for air temperature between 32F to 20F and the following:

a. Enclosure and auxiliary heat shall be provided to maintain air temperature above freezing. Do not lay masonry units having a temperature below 20F.

C. Cold-Weather Protection:

1. When the mean daily air temperature is 40F to 25F, masonry shall be completely covered for 24 hours with weather-resistive membrane.
2. When the mean daily air temperature is 25F to 20F, masonry shall be completely covered for 24 hours with insulating blankets with a weather-resistive covering. Extend time period to 48 hours for grouted masonry.
3. When the mean daily air temperature is 20F or below, masonry temperature shall be maintained above freezing for 24 hours by enclosure and auxiliary heating. Extend time period to 48 hours for grouted masonry.

D. Do not lay masonry units having either a temperature below 20F or containing frozen moisture, visible ice, or snow on their surfaces.

E. Remove visible ice and snow from the top surface of existing foundations and masonry to receive new construction. Heat these surfaces above freezing.

F. Top of all walls not enclosed or sheltered shall be covered with strong weather-resistive material at the end of each day or shutdown.

G. Partially completed walls shall be covered at all times when work is not in progress.

H. Any section of masonry deemed frozen and damaged shall be removed before continuing construction of that section.

I. Masonry units shall be dry at the time of placement. Wet or frozen units shall not be laid.

J. All cold weather masonry construction shall conform to TMS 402/602 Building Code Requirements and Specifications for Masonry Structures.

3.7 HOT WEATHER CONSTRUCTION

A. Hot weather construction is defined when:

1. The ambient air temperature exceeds 100F or exceeds 90F with a wind velocity greater than 8 mph.

B. Hot Weather Procedures:

1. Maintain sand piles in a damp, loose condition.
2. Provide necessary conditions and equipment to produce mortar having a temperature below 120F.

3. Flush mixer, mortar transport container, and mortar boards with cool water before they come in contact with mortar ingredients or mortar.
4. Use mortar within two hours of initial mixing.
5. Fog spray all newly constructed masonry until damp, at least three times a day until the masonry is three days old.
6. Do not spread mortar beds more than 4 feet ahead of masonry. Set masonry within one minute of spreading mortar.

3.8 PLACING AND BONDING

A. Unless otherwise noted, construct masonry in running bond pattern.

B. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

C. Lay hollow masonry units with face shell bedding on head and bed joints.

D. Bed and Head Joints:

1. Unless otherwise required, construct 3/8" thick bed and head joints.
2. At foundation, construct bed joint of the starting course a thickness not less than 1/4" and not more than 3/4".
3. Unless otherwise noted, tool joint with a round jointer when the mortar is thumbprint hard.
4. Remove masonry protrusions extending 1/2" or more into cells or cavities to be grouted.
5. Where masonry rests on concrete, the concrete shall be sandblasted or bushed.

E. Collar Joints:

1. Unless otherwise required, solidly fill collar joints less than 3/4 inch wide with mortar as the job progresses.

F. Place hollow units as follows:

1. With face shells of bed joints fully mortared.
2. With webs fully mortared in:

    a. All courses of piers, columns, and pilasters.
    b. In the starting course on foundations.
    c. When necessary to confine grout or loose fill.
    d. When otherwise required.

3. With head joints mortared, a minimum distance from each face equal to the face shell thickness of the unit.
4. Vertical cells to be grouted are aligned and openings are unobstructed.

G. Place solid units as follows:

1. Unless otherwise required, solidly fill bed and head joints with mortar.
2. Do not fill head joints by grouting with mortar.
3. Construct head by shoving mortar tight against the adjoining unit.
4. Do not deeply furrow bed joints.

H. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

I. Fully bond external and internal corners and intersections.

J. Remove excess mortar as work progresses.

K. Interlock intersections and external corners.

L. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

M. Where built-in items are too embedded into hollow masonry units, place a layer of metal lath in the joint below and fill cavities with mortar or grout.

N. Isolate masonry partitions from vertical structural framing members with a control joint and anchor as detailed on the drawings.

O. Where non-load bearing masonry partitions extend to underside of structural system, terminate masonry 1/2 inch to 3/4 inch below structure to allow for live load deflection to occur. Fill gaps with compressible joint filler or compressible fire stop material as required.

P. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry units at corners.

3.9 JOINTS

A. Maintain joint width to match abutting existing masonry wall joints.

B. Neatly tool exposed exterior and interior mortar joints.

C. Rake out mortar joints flush where sealants are shown.

D. Cut mortar joints flush where ceramic or quarry wall tile is scheduled, resilient and tile base is scheduled, and cavity insulation vapor barrier adhesive is applied.

3.10 CAVITY WALL

A. Do not permit mortar to drop or accumulate into the cavity air space or plug weep holes.

B. Construct inner wythe ahead of outer wythe to receive cavity insulation and vapor barrier adhesive. Strike joints facing the cavity flush.

C. Tie exterior wythe to backup with continuous horizontal joint reinforcing embedded in mortar joints at a maximum distance of 16 inches on center vertically.

D. Place horizontal reinforcing with drip centered over cavity.

E. Install cavity wall insulation and weeps as specified herein.

3.11 HORIZONTAL REINFORCEMENT AND ANCHORS

A. Install horizontal joint reinforcement as follows or as indicated on drawings:

1. Interior non-load bearing walls - 24 inches on center vertically.
2. Exterior walls and interior load bearing walls - 16 inches on center vertically.
3. Parapet walls - 8 inches on center vertically unless noted otherwise.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place joint reinforcement continuous in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches. Extend minimum 16 inches each side of openings.

E. Place joint reinforcement so longitudinal wires are embedded in mortar with a minimum cover of 1/2 inch when not exposed to weather or earth, and 5/8 inch when exposed to weather or earth.

F. Anchor masonry to structural members where masonry abuts or faces such members.

3.12 VERTICAL REINFORCEMENT

A. Support and secure reinforcing bars from displacement beyond the tolerances allowed by construction loads or by placement of grout or mortar. Maintain position within 1/2 inch of masonry unit or formed surface, but not less than 1/4 inch (only when fine grout is used).

B. Dowels in footings shall be set to align with cores containing reinforcing steel.

C. Place and consolidate grout fill without displacing reinforcing. Completely embed reinforcing bars in grout.

D. All cells containing reinforcing in concrete blocks shall be filled solid with grout.

E. Do not bend reinforcement after it is embedded in grout or mortar.

F. Reinforce masonry unit cores and cavities with vertical reinforcement bars and grout as indicated on the drawings. Place reinforcement and ties in grout spaces prior to grouting.

G. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.

H. Place steel in walls and flexural elements within 1/2 inch of required location.

I. Place vertical bars within 2 inches of the required location along the length of the wall.

3.13 REINFORCED MASONRY

A. Lay masonry units with core cells vertically aligned and clear of mortar dropping, debris, loose aggregates, and any material deleterious to masonry grout.

B. Support and secure reinforcing bars from displacement before grouting. Maintain position within 1/2 inch of dimensioned position.

C. Do not place grout until height of masonry to be grouted has attained sufficient strength to resist grout pressure.

D. Grout spaces less than two inches in width with fine grout using low lift grouting techniques. Grout spaces two inches or greater in width with coarse grout using high lift or low lift grouting techniques.

E. When grouting has stopped for more than one hour, terminate grout 1-1/2 inch below the top of the upper masonry unit to form a positive key for subsequent grout placement.

F. Do not wet concrete masonry units before laying.

3.14 GROUTING

A. Place grout in lifts not to exceed five feet. Consolidate grout at time of placement.

1. Consolidate grout pours 12 inches or less in height by mechanical vibration or by puddling.
2. Consolidate grout pours exceeding 12 inches in height by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.

B. When the grout pour height exceeds 5 feet 4 inches, provide a cleanout opening no less than 3 inches high at the bottom of each cell to be grouted by cutting one face shell of the masonry unit. Opening should be of sufficient size to permit removal of debris.

C. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.

D. Limit grout lift to 60 inches and rod for grout consolidation. Wait 30 to 60 minutes before placing next lift.

3.15 GROUTING REINFORCED CONCRETE BLOCK WALLS

A. Provide reinforcing bars at indicated spacing and fill cavities and voids solid with grout having a 28-day compressive strength as listed in the General Notes of the drawings.

3.16 GROUTING BLOCK CELLS BELOW LINTELS AND BEAMS

A. For lintel spans greater than 5'-0", grout block cells 24 inches beneath the lintel and 24 inches on each side of the opening.

3.17 LINTELS AND BOND BEAMS

A. Bond Beam Lintels:

1. Use specially shaped lintel units at hollow masonry unit walls, with reinforcing bars as shown and filled with concrete grout.
2. Provide minimum **16** inches of end bearing at each side of opening.
3. Provide reinforced concrete block lintels over openings less than 3'-0" wide that are not scheduled.
4. Place and consolidate the grout without disturbing the reinforcing.
5. Allow lintels to reach 100 percent of their design strength before removing temporary supports.
6. Do not place vertical control joints through bond beams. Place the vertical control joints at each end the bond beam lintel.

3.18 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints except above wall openings.

B. Provide vertical expansion, control, and isolation joints as indicated on the drawings. If joints are not indicated, provide control joints at a maximum spacing of 30'-0".

C. Install all built-in masonry accessory items as work progresses.

D. Exposed joints to be tooled slightly concave and concealed joints to be struck flush. Use a 3/4-inch diameter round tool for making 1/2-inch joints.

1. Bed Joints: Not less than 3/8-inch and not more than 2-inch thick.
2. Head Joints: To match bed joints.

E. Rake out mortar where sealants are shown or required.

3.19 BUILT-IN WORK AND EMBEDDED ITEMS

A. As work progresses, build in metal doorframes, window frames, wood nailers, steel angle lintels, anchor bolts, bearing plates, and other items supplied by other trades.

B. Connections of tornado rated frames to be inspected by owners special inspection agent.

C. Install pipes and conduits passing horizontally through non-bearing masonry partitions.

D. Install and secure connectors, flashing, weep holes, weep vents, nailing blocks, and other accessories.

E. Do not embed aluminum conduits, pipes, and accessories in masonry, grout, or mortar, unless effectively coated or covered to prevent aluminum-cement chemical reaction or electrolytic action between aluminum and steel.

F. Build-in items plumb and true.

G. Bed anchors of hollow metal frames in mortar joints. Fill frame voids solid with mortar. Fill masonry cores with grout minimum 12 inches from framed opening.

H. Do not build-in organic materials that will be subjected to rot or deterioration.

3.20 TOLERANCES

A. Comply with tolerances in the MSJC Code and the following:

1. Maximum variation from masonry unit to adjacent masonry unit is 1/32 inch.
2. Maximum variation from vertical and horizontal building lines shall be 1/4 inch in 10 feet and 3/8 inch in 20 feet or more.
3. Maximum variation from alignment of columns and pilasters shall be 1/4 inch.
4. Maximum variation from plumb shall be 1/4 inch per story, non-cumulative.
5. Maximum variation from level coursing shall be 1/8 inch in 3 feet, 1/4 inch in 10 feet, and 1/2 inch in 30 feet.
6. Maximum variation of joint thickness shall be 1/8 inch in 3 feet.
7. Maintain flush face on exposed masonry surfaces.
8. Masonry to receive thin set ceramic tile shall have flush mortar joints and a maximum surface variation or 1/8 inch.

3.21 CUTTING AND FITTING

A. Cut and fit masonry for chases, pipes, conduit, sleeves, and grounds. Coordinate fully with other trades to ensure correct size, shape, and location.

B. Obtain the Architect/Engineer's review prior to cutting or fitting any area not indicated on drawings or which may impair appearance or strength of masonry work.

3.22 CLEANING

A. Clean work under provisions of Division 1.

B. Remove excess mortar and smears.

C. Replace defective mortar. Match existing work.

D. Clean soiled surfaces with cleaning solution.

E. Use non-metallic tools in cleaning operation.

F. Clean exposed masonry surfaces of all stains efflorescence, mortar, or grout droppings or debris.

G. Where new masonry wall surfaces remain stained or defaced by mortar or any other foreign matter to a degree not acceptable to the Owner, clean surfaces by a light sandblasting at no added cost. Avoid damaging masonry surfaces and joints during sandblasting operations.

3.23 PROTECTION OF EXISTING WORK

A. Protect finished installation under the provisions of Division 1.

B. Without damaging completed work, provide protective boards at exposed external corners that may be damaged by construction activities.

C. Water Repellent Coating:

1. Apply sufficient coats of the approved material to achieve a consistent and uniform appearance, free from runs and sags, and with a uniformly resistive surface that will prevent penetration of water through the walls for the required period of warranty.
2. Twenty days after completion of the portion of work, and as a condition of its acceptance, demonstrate by running a water test showing it will successfully repel water.

    a. Notify the Architect/Engineer at least 72 hours in advance and conduct the test in the Architect/Engineer's presence.
    b. By means of an outrigger or similar acceptable equipment, place the nozzle of a 3/4" garden hose at a point approximately 10 feet away from the top of the wall, aiming the nozzle at a slight downward angle to direct the full stream of water onto the wall.
    c. Run the water onto the wall at full available force for not less than 4 hours.
    d. Upon completion of the 4-hour period, inspect the interior surfaces of the wall for evidence of moisture penetration.

3. If evidence of moisture penetration is discovered, apply an additional coat of the water repellent material to the exterior surface in areas directed by the Architect/Engineer, repeating the application and the testing, at no additional cost to the Owner, until no evidence of moisture penetration is found.

END OF SECTION

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SECTION 04 26 13
MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.

B. Clay facing brick.

C. Mortar and grout.

D. Reinforcement and anchorage.

E. Flashings.

F. Installation of lintels.

G. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Structural masonry applications.

B. Section 05 50 00 - Metal Fabrications: Loose steel lintels.

C. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

D. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2023.

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2026.

C. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2026.

D. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2025.

E. ASTM C91/C91M - Standard Specification for Masonry Cement; 2025.

F. ASTM C129 - Standard Specification for Dry-Cast Nonloadbearing Concrete Masonry Units; 2025.

G. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.

I. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2026.

J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025b.

K. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.

L. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

M. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

N. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.

O. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.

1.04 SUBMITTALS

A. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.

B. Submit Samples:

1. Three (3) samples for each color of facing brick units to illustrate color, texture, and extremes of color range.

2. Mortar finish samples for both brick and concrete masonry units; illustrating color, texture and match to existing building.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. Extra Facing Brick: Minimum 100 units, each color.

1.05 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1.06 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories and structural backup in mock-up.

B. Locate where directed.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.08 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: New concrete block shall comply with referenced standards and as follows:
1. Physical dimensions, texture and color: Match existing.
2. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 8 inches.
3. Special Shapes: Provide non-standard blocks configured for corners.
a. Provide bullnose units for outside corners.
4. Non-Loadbearing Units: ASTM C129.
a. Hollow block, as indicated.
b. Pattern: Smooth.

2.02 BRICK UNITS

A. Manufacturer:
1. Brick: Sioux City Brick Toasted Fine Art Velour.

B. Other Manufacturers (Matching samples required for use):
1. Endicott Clay Products Co: www.endicott.com/#sle.
2. General Shale Brick: www.generalshale.com/#sle.
3. Glen-Gary: www.glengery.com.
4. Meridian Brick LLC: www.meridianbrick.com/#sle.
5. Metro Brick: www.metrothinbrick.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
1. Color and texture: Match existing.
2. Nominal Size: Modular.
3. Special Shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
4. Compressive Strength: 20,000 PSI, measured in accordance with ASTM C67/C67M.

2.03 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M Type N.

1. Colored Mortar: Premixed cement as required to match existing building mortar as selected by design professional.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Hydrated Lime: ASTM C207, Type S.

D. Grout Aggregate: ASTM C404.

E. Water: Clean and potable.

F. Accelerating Admixture: Nonchloride type for use in cold weather.

G. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

2.04 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) yield strength, deformed billet bars; uncoated.

B. Joint Reinforcement Type: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

C. Joint Reinforcement Standard: ASTM A951/A951M.
1. Type: Ladder.

D. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face, hot dip galvanized to ASTM A 153/A 153M, Class B.
1. Vertical adjustment: Not less than 3-1/2 inches.
2. Product: Equal to 2-Seal™ Thermal Wing Nut Anchor manufactured by Hohmann & Barnard, Inc.: www.h-b.com/#sle.

2.05 FLASHINGS

A. Metal Flashing Materials: Stainless Steel, as specified in Section 07 62 00.

B. Combination Non-Asphaltic Flashing Materials - Stainless Steel:
1. Stainless Steel Flashing - Self-adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet with 8 mil of butyl adhesive and a removable release liner.
2. Stainless Steel/Polymer Fabric Flashing - Self-Adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded on inward facing side to a sheet of polymer fabric that has a clear adhesive with a removable release liner.
3. Stainless Steel/Polymer Fabric Drainage Plane Flashing: ASTM A240/A240M; 2 mil type 304stainless steel sheet bonded between one sheet of polymer fabric and one sheet of non-woven drainage material.

C. Drip Edge: Stainless steel; compatible with membrane and adhesives. Hemmed edges where exposed.

2.06 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.

C. Weep/Cavity Vents:
1. Type: Polyester mesh.
2. Color(s): Match mortar.

D. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
1. Mortar Diverter: Panels installed at flashing locations.

a. Manufacturers:
    1) Advanced Building Products, Inc: www.advancedbuildingproducts.com.
    2) CavClear/Archovations, Inc: www.cavclear.com.
    3) Mortar Net Solutions: www.mortarnet.com/#sle.

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
    1. Masonry below grade and in contact with earth; Type S.
    2. Exterior, non-loadbearing masonry; Type N.
    3. Exterior, loadbearing masonry; Type N.
    4. Interior, non-loadbearing masonry; Type N.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Design Professional's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Colored Mortar: Proportion selected pigments and other ingredients to match existing building, without exceeding manufacturer's recommended pigment-to-cement ratio.

D. Grout: ASTM C476; consistency as required to fill volumes completely for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
    1. Bond: Running.
    2. Coursing: One unit and one mortar joint to equal 8 inches.
    3. Mortar Joints: Concave.

D. Brick Units:
    1. Bond: Running.
    2. Coursing: Three units and three mortar joints to equal 8 inches.
    3. Mortar Joints: Concave.

3.03 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar as work progresses.

E. Interlock intersections and external corners, except for units laid in stack bond.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.

3.04 WEEPS/CAVITY VENTS

A. Install weeps in veneer walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

B. Install cavity vents in veneer walls at 24 inches on center horizontally below shelf angles and lintels and at top of walls.

3.05 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.06 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.

E. Lap joint reinforcement ends minimum 6 inches.

F. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

G. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

H. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

3.07 MASONRY FLASHINGS

A. Install flashing systems according to manufacturer’s instructions and the following:

B. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 4 inches, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

C. Terminate flashing up 8 inches minimum on vertical surface of backing:
   1. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer’s directions.

D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.

E. Support flexible flashings across gaps and openings.

F. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

G. Install thru-wall flashing 6-inches above finish grade, minimum.

3.08 LINTELS

A. Install loose steel lintels over openings.

3.09 GROUTED COMPONENTS

A. Lap splices minimum 48 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.10 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

D. Place control joints where indicated on drawings, or every 20 feet in cmu or 45 feet in brick.

E. Form expansion joint as detailed.

3.11 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

3.12 CUTTING AND FITTING

A. Cut and fit for pipes, conduit, sleeves, and structure. Coordinate with other sections of work to provide correct size, shape, and location.

3.13 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.14 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 04 43 13
STONE MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Anchored cut stone veneer at exterior walls.

B. Metal anchors and accessories for anchored veneer.

C. Setting mortar.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Flashings.

B. Section 07 92 00 - Joint Sealants: Sealing joints indicated to be left open for sealant.

1.03 REFERENCE STANDARDS

A. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2015.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. ASTM C119 - Standard Terminology Relating to Dimension Stone; 2020.

D. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025b.

E. ASTM C568/C568M - Standard Specification for Limestone Dimension Stone; 2015.

F. ASTM C1242 - Standard Guide for Selection, Design, and Installation of Dimension Stone Attachment Systems; 2026.

G. ASTM C1515 - Standard Guide for Cleaning of Exterior Dimension Stone, Vertical And Horizontal Surfaces, New or Existing; 2020.

H. ASTM C1528/C1528M - Standard Guide for Selection of Dimension Stone; 2020, with Editorial Revision (2025).

I. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2025.

J. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on stone units, mortar, and reinforcement.

C. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage, flashings and accessory locations.

D. Samples: Submit two stone samples illustrating minimum and maximum stone sizes, color range, texture, and markings.

E. Samples: Submit mortar color samples.

1.05 QUALITY ASSURANCE

A. Stone Fabricator Qualifications: Company specializing in fabricating cut stone with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type required by this section, with minimum three years of documented experience.

C. Installer Qualifications: Natural Stone Institute (NSI) Accredited Commercial B Contractor (light commercial); www.naturalstoneinstitute.org/#sle.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect stone from discoloration during storage on site.

B. Provide ventilation to prevent condensation from forming on stone.

1.07 FIELD CONDITIONS

A. Cold Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

B. Maintain materials and ambient air at minimum of 40 degrees F (5 degrees C) prior to, during, and for 48 hours after completion of work.

PART 2 PRODUCTS

2.01 STONE

A. Stone, General: See recommendations in ASTM C1528/C1528M.

B. Oolitic Limestone: Indiana Oolitic Limestone; complying with ASTM C568/C568M Classification II - Medium Density.
   1. Grade: ILI Standard.
   2. Color: Match existing.
   3. Grain Direction: Match existing.
   4. Surface Finish: Smooth; as described in ASTM C119 and ASTM C1528/C1528M.
   5. Acceptable Producers:
      a. Indiana Limestone Company: www.indianalimestonecompany.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MORTAR APPLICATIONS

A. Use only factory premixed packaged dry materials for mortar, with addition of water only at project site.
   1. Exception: If a specified mix design is not available in a premixed dry package, provide equivalent mix design using standard non-premixed materials.

B. Mortar Color: As selected by Design Professional from manufacturers standard premixed or field-mixed options. '"

C. Dash Bond Coat: One part Portland cement, with maximum two parts sand.

D. Pointing Mortars: Pointing or grouting mortars used to fill the joints between individual stone veneer units once the setting bed mortar has sufficiently cured.
   1. Prepackaged/Preblended: ASTM C1714/C1714M, Type N or Type S.
   2. Prepackaged/Preblended Latex Modified: ANSI A118.4 or ANSI A118.15.

2.03 MORTAR MIXES

A. Packaged Dry Material for Mortar for Unit Masonry: Premixed masonry cement and mason's sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
   1. Type: Type S.
   2. Color: Mineral pigments added as required to produce approved color sample.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Design Professional's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Mixing: Use mechanical batch mixer and comply with referenced standards.

2.04 ACCESSORIES - ANCHORED VENEER

A. Horizontal Joint Reinforcement: Ladder type; stainless steel wire complying with ASTM A580/A580M Type 304, 3/16 inch diameter side rods with 0.1483 inch diameter cross ties.

B. Wall Ties: Formed steel wire, stainless steel complying with ASTM A580/A580M, eye and pintle type, with provision for vertical adjustment after attachment.

C. Other Anchors in Direct Contact with Stone: ASTM A666 Type 304, stainless steel, of sizes and configurations required for support of stone and applicable superimposed loads.

D. Setting Buttons and Shims: Plastic.

E. Flashings: As specified in Section 07 62 00.

F. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane, or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

G. Weep/Cavity Vents: Polyester mesh.

H. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

2.05 STONE FABRICATION - ANCHORED VENEER

A. Nominal Thickness: 4 inch.

B. Face dimension and Coursing:

C. Fabricate for 3/8 inch beds and joints.

D. Bed and Joint Surfaces:
   1. Cut or sawn full square for full thickness of unit.

E. Backs: Sawn.

F. Slope exposed top surfaces of stone and horizontal sill surfaces for shedding water.

G. Cut drip slot in bottom surface of work projecting more than 1/2 inch over adjacent fenstration or cladding materials.. Size slot not less than 3/8 inch wide and 1/4 inch deep for full width of projection.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support work and site conditions are ready to receive work of this section.
   1. Per ASTM C1242, exterior walls to receive thin natural stone veneers should be designed with a stiffness ratio of L/1000 minimum.

3.02 PREPARATION - ANCHORED VENEER

A. Establish lines, levels, and coursing. Protect from disturbance.

B. Clean stone prior to installation. Do not use wire brushes or implements that mark or damage exposed surfaces.

C. Clean sawn surfaces of rust stains and iron particles.

3.03 INSTALLATION - ANCHORED VENEER

A. Install flashings of longest practical length and seal watertight to back-up. Lap end joints minimum 6 inches and seal watertight.

B. Cut stone at site to produce clean faces.

C. Size stone units to fit opening dimensions and perimeter conditions.

D. Wet absorptive stone in preparation for placement to minimize moisture suction from mortar.

E. Arrange stone coursing in ashlar bond with consistent joint width.

F. Set stone in full mortar setting bed to fully support stone over bearing surface. Use setting buttons or shims to maintain correct joint width.

G. Install weep/cavity vents in vertical stone joints at 24 inches on center horizontally; immediately above horizontal flashings, above shelf angles and supports, and at top of each cavity space; do not permit mortar accumulation in cavity space.

H. Install horizontal joint reinforcement 16 inches on center.

I. Place horizontal joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

J. Place joint reinforcement continuous in first and second joint below top of walls.

K. Lap joint reinforcement ends minimum 6 inches.

L. Attach wall ties to back-up to bond veneer to back-up at maximum 16 inches on center vertically and 36 inches on center horizontally.

M. In addition, place wall ties at maximum 3 inches on center each way around perimeter of openings, within 12 inches of openings.

N. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

3.04 JOINTS - ANCHORED VENEER

A. Leave the following joints open for sealant; see Section 07 92 00:
   1. Head joints in top courses, including copings, parapets, cornices, sills, and steps.
   2. Joints in projecting units.
   3. Joints between rigidly anchored units, including soffits, panels, and column covers.
   4. Joints below lugged sills and stair treads.
   5. Joints below ledge and relieving angles.
   6. Joints labeled "expansion joint".

B. Rake out mortar joints 5/8 to 3/4 inch and brush joints clean to accommodate pointing mortar. Fill joints with pointing mortar.

C. Pack mortar into joints and work into voids. Neatly tool surface to raked joint.

D. At joints to be sealed, clean mortar out of joint before it sets. Brush joints clean.

3.05 INSTALLATION - WATER-RESISTIVE BARRIER

A. Where required by thin stone veneer fabricator's instructions or by local codes, install two layers of water-resistive barrier in accordance with water-resistive barrier manufacturer's instructions. Integrate water-resistive barrier with all flashing accessories, adjacent water-resistive barriers, doors, windows, penetrations, and cladding transitions.

B. Apply water-resistive barrier horizontally with upper layer lapped over lower layer minimum 2 inches.

C. Lap water-resistive barrier minimum 6 inches at vertical joints.

D. Lap water-resistive barrier minimum 16 inches past the corner in both directions at inside and outside corners.

E. In two layer applications, start with two horizontal layers at bottom of exterior wall or structure.

3.06 INSTALLATION - MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

B. Extend metal flashings through exterior face of stone and terminate in an angled drip with hemmed edge.

C. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.07 CONTROL AND EXPANSION JOINTS

A. Form joints as detailed on drawings.

3.08 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.09 CLEANING

A. Remove excess mortar as work progresses, and upon completion of work.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Clean exterior stone per ASTM C1515.

E. Use non-metallic tools in cleaning operations.

3.10 PROTECTION

A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

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SECTION 05 12 23
STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fabrication and erection of structural steel work, as shown on the drawings and specified herein. Work shall include, but not be limited to the following items:

1. Structural steel.
2. Base and bearing plates.
3. Deck support angles and framing for roof openings.
4. Steel lintel members for masonry openings where noted on drawings.
5. Connection plates.
6. Shear stud connectors.
7. All other steel items as listed in AISC - "Code of Standard Practice for Steel Buildings and Bridges" as shown on structural and architectural drawings.

B. Work shall also include grouting of all structural steel members where indicated.

C. Structural notes indicated on the drawings regarding structural steel framing should be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 05 21 00 - Steel Joists.

D. Section 05 50 00 - Metal Fabrications.

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. AISC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.
2. AISC 303 - Code of Standard Practice for Buildings and Bridges.
3. AISC 360-**16** - Specification for Structural Steel Buildings.
4. ASTM A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
5. ASTM A36 - Standard Specification for Carbon Structural Steel.
6. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
7. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
8. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

9. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
10. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
11. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
12. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
13. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
14. ASTM A992 - Standard Specification for Steel for Structural Steel Shapes.
15. ASTM A1085 - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS).
16. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
17. AWS D1.1 - Structural Welding Code - Steel.

1.4 QUALITY ASSURANCE

A. Fabrication, Erection, and Welding Qualifications:

1. Fabricate structural steel members in accordance with AISC Specification for the design, fabrication, and erection of structural steel for buildings.
2. Steel erector shall have experience in the erection of structural steel framing on similar construction.
3. All welding of structural steel shall be performed by operators who are qualified as prescribed in "Qualification Procedures" of the American Welding Society (AWS).
4. Tolerances: Tolerances shall be as indicated by the AISC Code of Standard Practice for Buildings and Bridges, except that tolerances for fabricating, rolling, cambering and erection shall not be cumulative.

1.5 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's review, including framing plans indicating size, weight, and location of all structural members. Shop drawings shall indicate methods of connecting, anchoring, fastening, bracing, and attaching work of other trades.

    a. Where contract documents indicate verify in field (VIF) dimensions, shop drawings shall indicate these dimensions and Contractor shall note the dimensions have been verified.
    b. This specification modifies AISC Code of Standard Practice by deleting the following sentence from 4.4.1(c): "Release by the Owner's Designated Representatives for Design and Construction for the Fabricator to begin fabrication using the approved submittals." Review of the shop drawings by the Engineer shall not relieve the fabricator of this responsibility.

2. Furnish both the Engineer and Architect with one copy of the following:

    a. Final shop drawings containing all review notations.
    b. Field Use/For Construction drawings.

3. Prepare and submit for review structural calculations for all structural steel connections. Calculations shall be sealed by a **Professional Engineer** licensed in the State the project is located.
4. Welder's Certification: If requested, submit certification for all welders employed on the project demonstrating they have been AWS qualified to perform the welding procedures required for this project.

B. The General Contractor/Construction Manager shall conduct a field survey of as-built anchors and bearing plate locations and elevations prior to steel erection. Survey shall be furnished to the steel fabricator. Contractor shall identify deviations from approved shop drawings and submit proposed repairs and modifications to the **Engineer** and steel fabricator for approval.

1.6 DELIVERY, STORAGE AND HANDLING

A. Steel members shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Materials should be stored to allow easy access for inspection and identification. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of the ground and in such a manner as to eliminate excessive handling.

B. Store fasteners in a protected location. Clean and re-lubricate bolts and nuts before use.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel:

1. All structural steel shall be free from defects impairing strength, durability, or appearance. All structural steel shall meet the latest minimum requirements as follows:

    a. Structural steel wide flange shapes shall:

        1) Conform to the ASTM designations listed in the General Notes of the drawings, unless noted otherwise.

    b. Structural[**steel angles, channels, bars, plates and miscellaneous steel** shall conform to the ASTM designations listed in the General Notes of the drawings.
    c. Square and rectangular structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the drawings.
    d. Round structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the drawings.
    e. Steel pipe shall conform to the ASTM designations listed in the General Notes of the drawings.

B. High Strength Structural Bolts:

1. High strength structural bolts shall conform to the ASTM designations listed in the General Notes of the drawings.
2. High strength bolts shall be detailed and installed in accordance with AISC - "Specification for Structural Joints Using High-Strength Bolts."
3. Manufacturer's symbol and grade markings shall appear on all bolts and nuts.

C. Anchoring Devices:

1. Anchor Rods: Anchor rods used with structural steel members shall be plain threaded rods conforming to the ASTM designations listed in the General Notes of the drawings.

D. Welding Materials:

1. Type required for material being welded in conformance with AWS D1.1.

E. Steel Stud Connectors:

1. For threaded studs that are being used to connect steel beams to embed plates, use ASTM A108, Type A, Grades 1010 through 1020 forged steel, headed uncoated with a minimum tensile strength of 61,000 psi. Fabricated within the tolerances set forth in AWS D1.1.
2. For shear connectors that are being used on steel beams in concrete slabs for composite shear transfer and embedded steel members, use ASTM A108, Type B, Grades 1010 through 1020 forged steel, headed uncoated with a minimum tensile strength of 65,000 psi. Fabricated within the tolerances set forth in AWS D1.1
3. Studs applied by means of the electric arc welding process and shall use an arc shield ferrules of heat resistant ceramic.

F. Galvanizing: Where indicated on the drawings, steel shall be galvanized by the hot-dip process after fabrication conforming to ASTM A123. All exterior steel that will remain exposed shall be galvanized, unless otherwise indicated.

G. Paints and Primers:

1. Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.
2. Galvanizing repair paint: SSPC Paint 20.

H. Non-Shrink Grout for Base and Bearing Plates: Non-shrink grout, conforming to ASTM C1107, shall be pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents. All constituents shall meet the requirements of these specifications. Minimum compressive strength at 28-days shall be[**7,000** psi as determined by ASTM C109. Follow manufacturer's instructions for handling, mixing, placing, and curing. Acceptable products are:

1. Euclid Chemical Company - Euco N.S. Grout
2. L&M Construction Chemical - Crystex.
3. Master Builders - Masterflow 713.
4. Sonneborn - Sonnogrout.
5. Five Star Products Inc. - Five Star Grout.
6. Dayton Superior - Sure-Grip High Performance Grout.
7. Dayton Superior - 1107 Advantage Grout.

2.2 FABRICATION AND MANUFACTURE

A. Fabrication Procedures

1. Fabricate all structural steel items in accordance with AISC Specifications and as indicated on the approved shop drawings.
2. Provide camber in structural members where indicated.
3. Properly mark materials for field assembly and location for which intended. Fabricate for delivery sequence that will expedite erection and minimize handling of materials.
4. Complete structural steel assemblies before shop priming or galvanizing.

5. All shop connections shall be welded, unless noted otherwise on drawings. Connections shall develop the full strength of the adjoining members unless detailed otherwise.
6. All holes shall be either drilled or punched, as no burning of holes will be permitted, including the enlargement of holes. Provide all holes required for connections and for attaching the work of other trades where such holes are shown if furnished prior to fabrication.
7. Connections shall be detailed as standard framed beam connections (bearing type) in accordance with the AISC Manual of Steel Construction. Connections which require oversized holes or slotted holes in which the force is other than normal to the axis of the slot shall be detailed as "Slip-Critical Connections" and noted as such on the erection drawings. Provide bearing plates and end anchorage for beams resting on masonry.
8. All full and partial penetration welds shall be fully detailed on the shop drawings. Use backing for all full penetration welds.
9. Weld access holes shall be fabricated in accordance with the recommendations of AWS D1.1 and AISC Specification.

B. Steel Stud Connectors:

1. Steel stud shear connectors shall be securely welded in the field to structural steel beams as detailed on the drawings. Welds shall be such that the stud connector will deform before weld failure occurs. Welding shall be done in accordance with AWS D1.1.
2. Steel stud connectors for embedded plates and angles shall be welded in the fabrication shop in accordance with AWS D1.1.

C. Deck support framing and seats: Furnish all miscellaneous framing necessary to fully support the roof and floor steel decking.

D. Shop Priming:
1. The following are steel surfaces to receive shop priming:

a. Surfaces to be painted per Architect's drawings.

2. If the steel pieces are to be shop primed, the following surfaces are exceptions to shop priming:

a. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
b. Surfaces to be field welded.
c. Surfaces to be high-strength bolted with slip-critical connections.
d. Top flanges of beams supporting composite steel decking.
e. Surfaces to receive sprayed fire-resistive materials.
f. Galvanized surfaces.

3. Surface Preparation: Clean Surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

a. SSPC-SP 3, "Power Tool Cleaning."

4. Priming: Apply primer in accordance with paint manufacturer's recommendations, and at a rate recommended by SSPC to provide a dry film thickness of not less than [**1.5**mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

E. Finished Paint System for Exposed Structural Steel: Structural steel exposed to the elements of weather shall be painted as follows:

1. Apply one coat of steel primer in shop as specified above.
2. Apply two coats of alkyd enamel paint to a minimum dry film thickness of **1.5** mils for each coat. Paint shall be applied according to the manufacturer's recommendations.
3. Paint shall be free of sags, runs, drips or other defects. Allow ample drying time before handling to prevent damage to coatings.

4. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123.

    a. Fill vent holes and grind smooth after galvanizing.
    b. Unless otherwise noted on drawings or in Division 9, all exterior steel components exposed to the elements shall be galvanized, including, but not limited to, lintels.

2.3 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

2.4 ERECTION

A. Erection Procedures:

1. The erector and not the Structural Engineer shall be responsible for the means, methods, and safety of erection of the structural steel framing.
2. Erection of all structural steel items shall meet the requirements of AISC "Specification and Code of Standard Practice."
3. All work shall be erected square, plumb, straight and true, accurately fitted and with tight joints and intersections, by mechanics experienced in the erection of structural steel. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
4. Clean the bearing surface and other surfaces that will be in permanent contact before assembly.
5. Field connections of structural work shall be made with either high strength bolts (bearing type) or by welding. Proper precaution shall be taken to ensure anchored items will not be distorted or overstressed due to improperly fabricated items.
6. Splice members only where indicated unless, with the Structural Engineer's approval, splices not indicated would result in lower costs due to reduced shipping expense. For splices not indicated, submit structural calculations prepared under direct supervision of and signed by a **Professional** Engineer licensed in the state where the project is located.
7. Do not use thermal cutting during erection unless approved by the Engineer/Architect in writing.
8. Steel erection shall not proceed without concrete in footings, piers, and walls attaining 75% of the intended minimum compressive design strength. Documentation must be provided indicating compliance with this requirement.

B. Surveys:

1. Establish permanent benchmarks necessary for accurate erection of structural steel.
2. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.

C. Bracing and Protection:

1. Steel shall be well plumbed, leveled and braced to prevent any movement.

a. Contractor shall provide and maintain all necessary temporary guying of steel frame to safely resist all wind and construction loads during erection and to assure proper alignment of all parts of the steel frame.

2. Provide all temporary flooring, bracing, shoring and guards necessary to prevent damage or injury. All partially erected steel shall be secured in an approved manner during interruptions of work.

2.5 FIELD WELDING

A. Welding Procedures:

1. All field welding shall be in accordance with AISC Specifications and conform to AWS D1.1 "Structural Welding Code - Steel".

a. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

b. Contractor shall remove ceramic ferrules from shear stud connectors in sufficient time to allow for inspection of welds prior to placement of the concrete.

2.6 REPAIRS, PROTECTION, AND TOUCH UP

A. Repair damaged galvanized coatings and on galvanized items with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.

B. Touch up Painting: After installation, promptly clean, prepare, and prime or reprime field welds, final connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible primer of the same type as shop primer used on adjacent surfaces.
3. Secure approval by the Architect prior to field painting.

2.7 GROUTING

A. Grouting under structural framing members shall be completed after all members have been plumbed and braced and before imposed loads are placed thereon.

B. Remove all defective concrete, dirt, oil, grease, and other foreign matter from surfaces to which grout will be placed.

2.8 MISCELLANEOUS STEEL AND STEEL LINTELS

A. Furnish and install all miscellaneous steel as detailed in architectural and structural drawings.

B. The steel fabricator shall furnish all steel lintels required for masonry wall construction indicated in the architectural and structural drawings and schedules.

C. Provide additional steel framing for continuous support of steel deck edges at openings and column interruptions.

D. All exterior exposed steel shall be **hot-dip galvanized in accordance with ASTM A123**.

END OF SECTION

SECTION 05 21 00
STEEL JOISTS

1.1 SECTION INCLUDES

A. Fabrication and erection of open web steel joists. Work shall include but not be limited to, the following items:

1. K-series joists.
2. Joist substitutes.
3. Bridging.
4. Joist anchors and connections.

B. Structural notes indicated on the drawings regarding steel joists shall be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 03 41 00 - Structural Precast Concrete.

D. Section 04 22 00 - Reinforced Unit Masonry.

E. Section 05 12 23 - Structural Steel.

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. AISC 303 - Code of Standard Practice for Buildings and Bridges.
2. AISC 360-**16**- Specification for Structural Steel Buildings.
3. ASTM A36 - Standard Specification for Carbon Structural Steel.
4. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
5. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
7. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
8. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
9. AWS D1.1 - Structural Welding Code.
10. SJI 100 - Standard Specification for K-Series, LH-Series, and DLH-Series Open Web Steel Joists and for Joist Girders.
11. SSPC - Steel Structures Painting Council.

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in performing the work of this section with experience with similar projects. Fabrication company shall be certified by the Steel Joist Institute (SJI) to manufacture joists complying with the SJI Standard Specifications and Load Tables.

B. Manufacturer shall assume responsibility for engineering special joists indicated on the drawings to comply with the SJI standard specification performance requirements. This responsibility includes the preparation of shop drawings and comprehensive engineering analysis by a qualified **Professional** Engineer licensed in the State where the project is located.

C. Erector: Company specializing in performing the work of this section with experience on similar projects.

1.5 SUBMITTALS

A. Prepare and submit shop and erection drawings for Engineer's review.

B. Shop drawings:

1. Indicate standard designations, configuration, sizes, spacing, location of joists, and joist chord extensions.
2. Joining and anchorage details of attachment to other construction.
3. Size, location, and configuration of all code required bridging, bracing and connections.
4. Joist cambers.
5. Splice locations and details.
6. Type of paint and shop primer.
7. Dimensions verifying that field measurements are as shown on the drawings.

1.6 DELIVERY, STORAGE AND HANDLING

A. All joists and accessories shall be transported, stored, and erected in a manner, which will prevent any damage or deformation. Damaged joists shall not be erected or repaired without Structural Engineer's approval. Joists shall be stored clear of the ground in such a manner so as to eliminate excessive handling and protect from weather with a weatherproof covering.

B. Deliver and store all joists and accessories to the site according to all SJI requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bar Joists: Steel used in the manufacture of bar joists shall be as allowed by the Steel Joist Institute (SJI) standard specification for chord and web members.

B. High Strength Bolts and Nuts: ASTM F3125, Grade A325, Type 1 heavy hex steel structural bolts, heavy hex carbon steel nuts, and hardened carbon steel washers. Finish shall be plain, uncoated.

C. Carbon Steel Bolts and Threaded Fasteners: ASTM A307, Grade A, carbon steel, hex head bolts and threaded fasteners; carbon steel nuts; and flat unhardened steel washers. Finish shall be **plain, uncoated**.

D. Miscellaneous items, such as bridging, headers, bolts, nuts, washers, anchors, and all other appurtenances for a complete steel joist installation shall be furnished as a part of the work of this section.

E. Primer: Provide the manufacturer's standard shop primer with good resistance to normal atmospheric corrosion and complying with the performance requirements specified in the SJI "Standard Specification" previously cited.

1. Do not prime paint joists and accessories scheduled to receive spray applied fireproofing.

F. Welding Materials: AWS D1.1; type required for materials being welded.

2.2 FABRICATION AND MANUFACTURE

A. Manufacture K-Series steel joists according to "Standard Specification for Open Web Steel Joists, K-Series," in SJI "Specifications," with steel angle top and bottom chord members, underslung ends, and parallel top chords; of joist type indicated.

B. All steel joists shall consist of an electrically welded open-web type, designed, and fabricated to conform to the "Standard Specifications" included in the SJI or AISC publications cited above and shall be manufactured by a current member of the Steel Joist Institute.

C. Provide holes in chord members for connecting and securing other construction to joists. General Contractor shall coordinate this information and provide the manufacturer with drawings outlining the location of any required holes.

D. Bridging members for open web joists, unless otherwise indicated on the drawings, shall be continuous wall to wall, complete with suitable anchorage at each end, all in accordance with SJI "Standard Specifications".

E. Design and fabricate joists and bridging to support a minimum net uplift as indicated on the drawings. A 1/3 stress increase shall not be used in uplift design.

F. Camber **joists as indicated**.

G. Provide extended bearing ends of joists with SJI's Type R extended ends where indicated on the drawings.

2.3 CLEANING, PRIMING AND PAINTING

A. Apply one shop coat of primer to joists and joist accessories to be primed to provide a continuous dry film thickness of not less than **1** mil.

B. Painting of joists and joist accessories is specified in Division 9 Section "Painting."

2.4 ERECTION

A. Erection of all steel joist items shall meet the applicable requirements of the SJI "Standard Specifications" previously cited.

B. All anchor bolts, wall anchors, bridging anchors, bearing plates and similar items to be built into concrete or masonry are to be set by the concrete or masonry contractors and shall be furnished promptly so they may be built-in as the work progresses as no cutting for the same afterward will be permitted. Beginning of installation means erector accepts existing conditions.

C. All steel joists shall be accurately set to the lines, elevations and dimensions indicated on the approved shop drawings.

D. Bridging shall be installed concurrently with joist erection and before loads are applied. Bridging shall be securely welded to joist chords in a manner that will not damage joist members and so as to ensure positive resistance to both tensile and compressive stresses. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

E. All joists bearing on concrete or masonry shall bear on a steel bearing plate and joists bearing on steel shall be welded to the supporting steel.

F. All field welding shall be in accordance with AWS previously cited.

G. All construction loads shall be kept off joists until they are permanently anchored and bridged. During construction, care shall be taken to avoid excessive concentrated or moving loads. Provide for adequate distribution of any such loads so the carrying capacity of the joists is not exceeded.

H. Joist shall not be positioned any greater than **1/4 inch** from true alignment and shall not vary more than **1/4 inch** from plumb.

2.5 FIELD TOUCH UP

A. Immediately after erection, Contractor shall touch up all erection bolts, all field welds and all scratched or abraded areas and paint out erection markings with matching rust-inhibitive primer in color and formulation to match shop primer.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel, aluminum, and stainless steel items, including:
   1. Support for ceiling-hung MEP items.
   2. Steel support system for glass railings.

B. Miscellaneous angles, channels, tubes, plates, brackets and fasteners, as required to complete the project, including but not limited to:
   1. Shelf angles.
   2. Jamb angles and plates.
   3. Loose angle lintels.
   4. Angles for specialty glazing installation.

C. Slotted Channel Adjustable Framing System.

D. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 06 10 00 - Rough Carpentry: Concealed blocking or substrate for items specified in this section.

C. Section 09 90 00 - Painting.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

J. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2025.

K. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2026.

L. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2023.

M. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

N. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

P. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

Q. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

R. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).

S. OSHA 1910.27: Fixed Ladders.

T. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

U. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   3. Where installing items to existing precast concrete, concrete or masonry, propose connections not detailed for structural engineer approval.

1.05 QUALITY ASSURANCE

A. Design members and connections under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

C. Fabricate steel items in accordance with AISC "Steel Construction Manual."

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

F. Slotted Channel Fittings: ASTM A1011/A1011M.

G. Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153/A153M where connecting galvanized components.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

K. Anchoring Devices:

1. Anchor Rods: Anchor rods used with structural steel members shall be plain steel rods conforming to ASTM F1554 (Grade 36), complete with suitable nuts and washers, unless noted otherwise.
2. Expansion Bolts: Expansion anchors shall consist of one-piece wedge type carbon steel anchor bolts with heavy-duty nuts and washers. All components shall be zinc plated in accordance with ASTM B633.
    a. Structural Applications
        1) Acceptable products must have a valid and current ICC report, as listed at www.icc-es.org.
    b. Non-Structural Applications
        1) Acceptable Manufacturers and products: Hilti Fastening Systems- Kwik Bolt III Anchor; ITW Red Head Mechanical Anchoring Systems - Trubolt Wedge Anchor; Powers Fastening Inc - Power-Stud Anchor; (or approved equivalent)
3. Epoxy Adhesive Anchoring System: Epoxy anchoring shall consist of a threaded rod and the epoxy adhesive cartridge.
    a. Structural Applications
        1) Acceptable products must have a valid and current ICC report, as listed at www.icc-es.org.
    b. Non-Structural Applications
    c. Acceptable Manufacturers and products: Hilti Fastening System - HIT RE 500; ITW Red Head Adhesive Anchoring Systems - Epcon C6 Adhesive; Powers Fastening Inc. - PE1000+; (or approved equivalent.

L. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107/C 1107M and capable of developing a minimum compressive strength of 5,000 psi at 28 days.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

C. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

D. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

E. Bolts, Nuts, and Washers: Stainless steel.

F. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 MATERIALS - STAINLESS STEEL

A. Stainless Steel
    1. ASTM A 666, Type 304.

B. Bolts, Nuts, and Washers: Stainless steel.

C. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.04 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

E. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

F. Welded Joints: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings. Weld corners and seams continuously where visible or where exposed to moisture, even if intermittent or stitch welds are structurally adequate, and to comply with the following:
   1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by continuous welds.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

2.05 FABRICATED ITEMS

A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking and other non-structural members; prime paint finish.
   1. Items used at the exterior to be galvanized with prime painted for field finishing.

B. Lintels: As detailed or as scheduled in Structural Notes; hot dip prime paint and painted in the field.
   1. Size loose lintels to provide bearing length at each side of opening to be 1/12 its length, but not less 6 inches, unless noted otherwise.

C. Door Frames for Overhead Door Openings: Steel plate and angle sections; thickness and depths as detailed; galvanized finish for High Performance Coating finish.

D. Support for Ceiling-hung MEP items: As detailed, prime paint finish. If not detailed, use slotted channel adjustable framing system

E. Support Framing for Operable Partition: As detailed or as recommended by manufacturer; prime paint for field finishing.

F. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.
   1. Product: System of channel members and bolted connections fabricated to support loads without welded connections.

2.06 FINISHES - STEEL

A. Prime paint ALL steel items not scheduled for other finishes.
   1. Exceptions:
      a. Galvanize items to be embedded in concrete, items to be imbedded in masonry, and items specified for alternative (not painted) finish.
      b. Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

C. Paint Coatings: Refer to Section 09 90 00 - Painting.

2.07 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Examine substrates and site area for conditions that might prevent satisfactory installation.
   1. Where installing items to existing precast concrete, concrete or masonry, propose connections not detailed for structural engineer approval.

C. Verify that dimensions of supporting structure are within plus/minus 1/8 inch of dimensions shown on shop drawings.

D. Verify that all adjacent painting, roofing, masonry work, and other work that might damage prefinished items has been completed prior to installation.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

C. Remove all mill scale, rust, grease, foreign matter and surface imperfections from steel components that will be painted to ensure a smooth, even appearance of finish.

3.03 INSTALLATION

A. Install premanufactured items in accordance with manufacturer's installation instructions.

B. Install items plumb and level, accurately fitted, free from distortion or defects.

C. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Anchor units to structure as indicated on the drawings.

E. Field weld components as indicated on shop drawings.
   1. Perform field welding in accordance with AWS D1.1/D1.1M.

F. Obtain approval prior to site cutting or making adjustments not scheduled.

G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

H. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors. Grout voids as required to result in secure installation.

I. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/8 inch per story or 10 feet, non-cumulative.

B. Maximum Offset From True Alignment: 1/8 inch in 10 feet.

C. Maximum Out-of-Position: 1/8 inch in 48 inches.

3.05 CLEANING

A. Clean exterior surfaces of dust and debris; follow manufacturer's cleaning instructions for the finish used.

3.06 PROTECTION

A. Protect items after installation to prevent damage due to other work until Date of Substantial Completion

END OF SECTION

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SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Nonstructural dimension lumber framing.

C. Rough opening framing for doors, windows, and roof openings.

D. Sheathing.

E. Preservative treated wood materials.

F. Fire retardant treated wood materials.

G. Concealed wood blocking, nailers, and supports.

H. Miscellaneous wood nailers, furring, and grounds.

I. Laminated wood and insulation panels.

1.02 RELATED REQUIREMENTS

A. Section 07 27 00 - Air Barriers: Air barrier over sheathing.

B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2018, with Errata (2019).

D. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.

E. PS 1 - Structural Plywood; 2023.

F. PS 20 - American Softwood Lumber Standard; 2025.

1.04 SUBMITTALS - NA

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on products and accessories specified in this section.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS - NON COMBUSTIBLE

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 STRUCTURAL COMPOSITE LUMBER

A. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.

2.04 CONSTRUCTION PANELS

A. Backing for wall-mounted items: 20 gauge sheet metal on top of studs, beneath gypsum board finish or as detailed.
   1. Sheet metal backing is not permitted for wall mounted desktop counters.

B. Other Applications:
   1. Plywood Exposed to View But Not Exposed to Weather: Fire resistant treated, PS 1, A-D, or better.
      a. Application(s): Supplemental casework construction and support for solid surface, quartz, and other engineered or natural shelf, workstation and counter top finish materials.

2.05 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Lag Screw (for wood blocking): Modified truss or pancake framing head, non-interfering with panel materials. Self tapping and sized appropriately for applied loads.
   3. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   4. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

C. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.

D. Air Barrier: See Section 07 27 00.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

B. Fire Retardant Treatment:
   1. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Treat rough carpentry items as indicated .
      c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.

E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

D. Provide the following specific nonstructural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Wall paneling and trim.
   8. Joints of rigid wall coverings that occur between studs.

3.05 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.

4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated caswork.

B. Hardware.

C. Preparation for installing utilities.

D. Loose shelving and supports.

E. Related Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 07 92 00 - Joint Sealers: sealant at millwork and countertops at walls

C. Section 10 11 00 - Visual Displayboards: Tackable surfaces used in conjunction with casework and finished carpentry items.

D. Section 12 36 00 - Countertops.

E. Division 22 - Plumbing: coordination of drop-in or undermount sinks, plumbing fixture trim and connections

F. Division 26 - Electrical: coordination of lighting and electrical trim and connections.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. AWI (QCP) - Quality Certification Program; Current Edition.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2018).

E. BHMA A156.9 - Cabinet Hardware; 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Provide casework locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, clearances required. Indicate materials, component profiles, configurations, assembly methods, fastening methods, jointing details, utility and service requirements and locations, accessory listings, hardware location and schedule of finishes.
   1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
   2. Provide information as required by AWI/AWMAC/WI (AWS).

C. Product Data:
   1. Provide data for hardware accessories.
   2. Provide data of compliance with Formaldehyde Emissions Evaluation.

D. Finish Verification Samples:
   1. For each finish product specified, two each, 3 inches x 5 inches, of colors and finishes selected by architect.

E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.06 DESIGN REQUIREMENTS

A. Reinforce frame and support counters in all areas, to safely support a load of 200 lbs concentrated on one square foot in any area with no indentation showing on surface and with permanent set not exceeding 0.005 inch.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

B. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, grade as indicated below.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Accept casework on site. Inspect on arrival for damage.

B. Protect units from moisture, soiling, or damage during handling and installation.

C. Protect countertop surfaces throughout the construction period with corrugated cardboard covering the top and securely taped to edges.

1.09 FIELD CONDITIONS

A. Coordinate casework installation with size, location and installation of service utilities.

B. Coordinate layout and installation of blocking and reinforcement in walls for support of casework.

C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.

D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

E. Do not deliver product until the following conditions are met:
   1. Windows and doors are installed and the building is secure and weathertight.
   2. Ceiling, overhead ductwork and lights are installed.
   3. All painting is completed and flooring is installed.

F. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

B. Cabinets:
   1. Finish - Exposed Exterior Surfaces: Decorative laminate.
   2. Finish - Exposed Interior Surfaces (inside of units without doors): Decorative laminate.
   3. Finish - Semi-Exposed Surfaces (inside of units with doors): Thermally Fused Laminate (TFL).
   4. Finish - Concealed Surfaces: Manufacturer's option.
   5. Door and Drawer Front Edge Profiles: Square edge, PVC edge banding to match laminate.

6. Shelves and panel edges for cubbies and cabinets without doors: Square edge, PVC edge banding to match laminate.
7. Door and Drawer Front Retention Profiles: Fixed panel.
8. Casework Construction Type: Type A - Frameless.
9. Layout for Cabinet and Door Fronts: Flush panel.
10. Cabinet Design Series: As indicated on drawings.
11. Adjustable Shelf Loading: 50 psf.
    a. Deflection: L/144.
12. Cabinet Style: Flush overlay.
13. Cabinet Doors and Drawer Fronts: Flush style.
14. Drawer Construction Technique: Dovetail joints or doweled and glued.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 PANEL MATERIALS

A. Air Quality: composite wood sheet materials comply with Formaldehyde emissions evaluation criteria described in section Section 01 61 16 VOC Content Restrictions.

B. Medium Density Fiberboard "MDF": ANSI A208.2; type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated; composed of wood fibers pressure bonded with marine-grade waterproof adhesive to suit application; no formaldehyde permitted; sanded faces.

C. Particleboard: ANSI A208.1Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; unsanded faces.
    1. No urea-formaldehyde adhesive. certified by the Composite Panel Association (CPA) to comply with their Environmentally Preferable Product (EPP) Specification CPA 2-06.
    2. Thickness: 3/4-inch, unless otherwise noted
    3. Minimum Density: 45 pcf.
    4. Face Screw Holding Capacity: 247 pounds.
    5. Use as substrate for plastic laminate facings, unless otherwise indicated.
    6. Minimum core thicknesses for cabinet components:
        a. Cabinet backs, drawer bodies, and drawer bottoms: 1/2 inch.
        b. Drawer and door faces: 3/4 inch.
        c. Cabinet tops, bottoms, sides and related components: 3/4 inch.
        d. Shelves: 1 inch.

D. Softwood Plywood, Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B, glue type as recommended for application.

2.04 COUNTERTOPS

A. Countertops: See Section 12 36 00.

2.05 ACCESSORIES

A. Lumber for Shimming: Softwood lumber of pine species.

B. Adhesive: Type recommended by AWI/AWMAC to suit application.

C. Edge Banding: 3 mm PVC edge banding to match laminate.

D. Fasteners: Size and type to suit application.

E. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

F. Concealed Joint Fasteners: Threaded steel.

G. Casters: Caster wheels of non-marring type urethane tires in gray or black color; with locking capability; base plate for mechanical fastening.

H. Grommets: Standard plastic grommets for cut-outs, in color as selected by Architect from manufacturer's full range.
   1. Furnish and install 3 grommets per work space to be field located, verify final quantity with Architect.
   2. Product: “EDP3” manufactured by Doug Mockett and Co, Inc; or approved equivalent.
   3. Solid surface countertops to have holes cut in the shop, at locations as shown on drawings.

I. Z-clips: aluminum, 1/4” nominal projection, lengths as required for weight of wood component, with predrilled holes.
   1. Acceptable Manufacturers:
      a. Fry Reglet: Graph Modular Wall System; www.fryreglet.com
      b. Monarch Metal Fabrication; www.monarchmetal.com
      c. Orange Aluminum; www.orangealuminum.com
      d. New York Metal; www.newyorkmetal.com
      e. Outwater Plastics Industries Inc; www.outwatercatalogs.com
      f. Substitutions: See Section 01 60 00 - Product Requirements.

J. Countertop Support Brackets: see Section 12 36 00 - Countertops

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports at casework: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, satin chrome finish, for nominal 1 inch spacing adjustments.
   1. Product: KVE 346ANO manufactured by Knape and Vogt.

C. Countertop Brackets: Fixed, L-shaped, face-of-stud mounting.
   1. Materials: Steel; applicable fasteners.
      a. Finish: Manufacturer's standard, factory-applied, powder coat.
      b. Color: Match wall color.
      c. Support Length: Determined by depth of countertop.
   2. Products:
      a. A&M Hardware, Inc; Heavy-Duty Hybrid Brackets: www.aandmhardware.com/#sle.

D. Drawer and Door Pulls: Equal to Simsbury 4 inch Pull, Satin Chrome 4 CC #LH P61200-SC by Holdahl Company.

E. Cabinet Locks: To be disc tumbler cylinder cam, keyed alike per work station and master keyed.
   1. Provide lock manufacturer's elbow latch (heavy duty option) at upper cabinet locations with pair doors; finish to match cabinet locks.
   2. Product: C8054-14A manufactured by National Lock Co.
   3. Locations: As indicated on Interior Elevations.

F. Drawer Slides:
   1. Type: Full extension.
   2. Static Load Capacity: Extra Heavy Duty grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide self-closing and soft-closing type.
   6. Manufacturers:
      a. Accuride International, Inc: www.accuride.com.
      b. Grass America Inc: www.grassusa.com.
      c. Hettich America, LP: www.hettich.com/#sle.
      d. Knape & Vogt Manufacturing Company: www.knapeandvogt.com.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

G. Hinges: European style concealed self-closing type,also soft-closing, steel with satin finish.
   1. Manufacturers:
      a. **BASIS OF DESIGN:** Grass America Inc; TEC 863: www.grassusa.com.
      b. Hafele; www.hafele.com
      c. Hardware Resources: www.hardwareresources.com.
      d. Julius Blum, Inc: www.blum.com.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

H. Hooks: Surface-mounted; stainless steel, satin finish.
   1. Product(s): Equal to Amerock Emerge Double Robe Hook.

I. Wall Cleats: French cleats for stud wall partitions, with lower cleat fastened to wall and upper cleat fastened to millwork.

J. Concealed panel clips: Plastic male-female fitting;
   1. Product: Hafele Keku Push-in Fitting, Button-fix or approved equal.

K. Adjustable Shelf Supports for loose shelving: Standard back-mounted system using surface mounted metal shelf standards and coordinated cantilevered shelf brackets, satin chrome finish, for nominal 1 inch spacing adjustments.
   1. Product: #80 standards with #180 brackets manufactured by Knape and Vogt.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
   1. All exposed edges of adjustable shelving in open cabinets to receive PLAM.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
   2. Cap exposed plastic laminate finish edges with plastic trim.

E. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets and counter bases to floor using appropriate angles and anchorages.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

H. Provide matching casework filler panel to occupy remaining space between casework and adjacent walls as necessary to accommodate for field dimensions.

3.03 INSTALLATION ITEMS BY TRADE CONTRACTOR

A. Install plumbing and electrical service to and within equipment.

B. Set plumbing fixtures and accessory fixtures, and make final connections of such.

C. Complete wiring and connection to electrical boxes, receptacles, switches, lights, and flush plates. Work shall be in accordance with local codes, whether or not specifically called for in the contract documents.

D. Close ends of units, splash aprons, shelves and bases with sealant.

3.04 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.05 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

B. Clean all materials provided under this section and all adjacent materials, which may have become soiled from this work.

1. High Pressure Laminates (HPL): refer to NEMA publication Ld3-2005 Annex B Care and Cleaning of Laminates.

C. Wipe out millwork interiors and empty drawers of dirt and debris. Remove pencil marks and other blemishes from millwork surfaces.

D. Remove foreign matter that could affect operation or appearance of hardware.

E. Make final adjustments to drawers and doors. Doors shall swing freely. All doors shall be aligned both vertically and horizontally. Drawers shall open and close smoothly, without binding or excessive slide and play.

3.06 PROTECTION OF FINISHED WORK

A. Do not permit finished casework to be exposed to continued construction activity.

B. Cover with protective cover, taped to casework.

C. Remove temporary protective cover at date of Substantial Completion.

END OF SECTION

SECTION 06 61 16
SOLID SURFACE FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast plastic resin shower stalls.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Solid wood blocking to support grab bars and shower seats.

B. Section 09 21 16 - Gypsum Board Assemblies: Substrate for shower wall panels.

C. Section 12 36 00 - Countertops: Countertops and integral sinks.

D. Division 22 - Plumbing.

1.03 REFERENCE STANDARDS

A. IAPMO / ANSI Z124.2 - Plastic Bathtub and Shower Units; 2005.

B. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2011.

C. ASTM D4058 - Standard Test Method for Attrition and Abrasion of Catalysts and Catalyst Carriers; 1996 (Reapproved 2015)

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. ASTM F462 - Standard Consumer Safety Specification for Slip-Resistant Bathing Facilities; 1979 (reapproved 2007).

1.04 SUBMITTALS

A. Shop Drawings: Indicate dimensions, thicknesses, required clearances, tolerances, materials, colors, finishes, fabrication details, field jointing, adjacent construction, design load parameters, methods of support, integration of plumbing components, and anchorages.

B. Product Data: Provide data on specified component products and connection requirements.

1.05 MOCK-UP

A. Install mock-up of shower base and wall panels to serve as basis for evaluation of appearance, texture, workmanship and slip-resistance.
   1. Number of Mock-Ups to be Prepared: One (1) shower stall.
   2. Locate where directed.

B. Obtain approval of mock-up by Owner's Representative and Design Professional before proceeding with similar work in other areas.

C. Approved mock-up may remain as part of the Work.

1.06 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Miscellaneous Fabrications:
   1. Dupont: www.corian.com.
   2. Inpro Architectural Products: www.inprocorp.com.
   3. Wiltcher Industries: www.wiltcherindustries.com.

B. Shower Stalls:
   1. Inpro Corporation; Product BioPrism Shower Walls and Receptor/Base: www.inprocorp.com.

2. Tower Industries Inc; Product Shower Wall Panels and Shower Bases for Universities: www.towersurfaces.com.
3. Transolid / a division of Trumbull Inductries, Inc; Product Remodel Showers: www.transolid.com.
4. Wiltcher Industries, Inc; Product Solid Surface Shower Walls and Pans: www.wiltcherindustries.com.
5. Substitutions: Not permitted.

2.02 MATERIALS

A. Solid Surfacing:
1. Applications: Wall panels and Shower surrounds.
2. Materials: Homogeneous compression-molded material composed of reacted monomers, resins, mineral fillers, and pigments; manufactured into sheets.
3. Surface Burning Characteristics: Flame spread index of 25 maximum; smoke developed index of 450 maximum; when tested in accordance with ASTM E84.
4. Solid Surfacing Type: Standard; as classified by ISFA 2-01.

2.03 FASTENINGS

A. Adhesive: As recommended by the manufacturer for application; not containing formaldehyde or other volatile organic compounds.

2.04 FABRICATION

A. Fabricate components by mold to achieve shape and configuration.

B. Gel coat the finish exposed surfaces smooth and polish to a low sheen.

C. Radius corners and edges.

2.05 ACCESSORIES

A. Wall Panel Substrate: Cementitious backing board; see Section 09 21 16 - Gypsum Board Assemblies.

B. Adhesives: Type recommended for particular application by manufacturer; low VOC option.

C. Joint Sealant: Manufacture's recommend product or mildew-resistant paintable silicone sealant. Color to match solid surface components.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 PREPARATION

A. Provide templates and rough-in measurements.

B. Provide blocking / backing as required to support panel edges and joints, and accessories (grab bars, seats, etc).

3.03 INSTALLATION

A. Install components in accordance with approved shop drawings and manufacturer's instructions.

B. Apply sealant at all joints to abutting surface finishes.

3.04 TOLERANCES

A. Maximum Variation From True Dimension: 1/8 inch.

B. Maximum Offset From True Position: 1/8 inch.

3.05 CLEANING

A. Clean and polish surfaces in accordance with manufacturer's instructions.

3.06 SCHEDULES

A. Shower Stalls: Shower wall kit, with pan.
   1. Color: As scheduled on Drawings.
   2. Finish: Matte.
   3. Wall Kit: Includes three (3) wall panels (1 back and 2 sides), two (2) corner coves, trim kit, corner blocks, and color-coordinated installation kit with color-matched silicone sealant.
      a. Panel Height: 96 inches.
      b. Panel Thickness: 1/4 inch.
   4. Accessible Stalls, Transfer Type: 36 x 36 inches size.
      a. Wall Kit: As described above.
         1) Accessories:
            (a) Soap Dish: One (1) corner-type soap dish per shower stall.
      b. Shower Pan: Single raised threshold at open side, center drain.
         1) Floor: ASTM F462; minimum 0.20 non-slip coefficient, with channels directing water to drain at maximum 1/4 inch per foot (2 degree) slope.
   5. Product: Equal to Prism™ Solid Surface Shower Walls by Inpro Corp.

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SECTION 06 83 16
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

B. Trim.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants.

B. Section 09 21 16 - Gypsum Board Assemblies.

1.03 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2026.

B. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

C. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

E. FDA Food Code - Chapter 6 - Physical Facilities; Current Edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Panels: 32 sq ft of each type and size.
   3. Extra Panels: Quantity equal to 5 percent of total installed.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fiberglass Reinforced Plastic Panels:
   1. Crane Composites, Inc: www.cranecomposites.com/#sle.
   2. Marlite, Inc: www.marlite.com/#sle.
   3. Nudo Products, Inc: www.nudo.com/#sle.
   4. Panolam Industries International, Inc: www.panolam.com/#sle.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL SYSTEMS

A. Wall Panels:
   1. Panel Size: 4 by 8 feet.
   2. Panel Thickness: 0.10 inch.
   3. Surface Design: Embossed.
   4. Color: White.
   5. Attachment Method: Adhesive only, sealant joints, no trim.

2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
   1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Impact Strength: Greater than 6 ft lb force per inch, when tested in accordance with ASTM D256.
   4. Surface Characteristics and Cleanability: Provide products that are smooth, durable, and easily cleanable, in compliance with FDA Food Code, Chapter 6 - Physical Facilities.

B. Trim: Vinyl; color coordinating with panel.

C. Adhesive: Type recommended by panel manufacturer.

D. Sealant: Type recommended by panel manufacturer; white.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

E. Install panels with manufacturer's recommended gap for panel field and corner joints.

F. Place trim on panel before fastening edges, as required.

G. Fill channels in trim with sealant before attaching to panel.

H. Install trim with adhesive and screws or nails, as required.

I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

J. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction, perimeter foundation wall, underside of floor slabs, and exterior wall behind cladding wall finish.

1.02 RELATED REQUIREMENTS

A. Section 07 54 00 - Thermoplastic Membrane Roofing: Installation requirements for board insulation over low slope roof deck.

1.03 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 FOAM BOARD INSULATION MATERIALS

A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.
   1. Classifications:
      a. Type II: Faced with either cellulosic facers or glass fiber mat facers on both major surfaces of the core foam.
         1) Class 4 - Faced with coated or uncoated glass fiber mat facers on both major surfaces of core foam. This product is used at a maximum thickness of 1/2 inch (12.7 mm).
         2) Compressive Strength: Class 4, Grade 1 - 80 psi (551 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Comply with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   5. Board Size: 48 inch by 96 inch.
   6. Board Thickness: As indicated on drawings.
   7. Thermal Resistance: Nominal R-value of 6 per inch.
   8. Board Edges: Square.
   9. Products:
      a. Atlas Roofing Corporation; EnergyShield CGF PRO: www.atlasroofing.com/#sle.
      b. Carlisle Coatings & Waterproofing, Inc; R2+ Matte: www.carlisleccw.com/#sle.
      c. GAF; EnergyGuard Polyiso Insulation: www.gaf.com/#sle.
      d. Hunter Panels; Xci Foil (Class A): www.hunterpanels.com/#sle.
      e. Johns Manville; AP Foil-Faced: www.jm.com/#sle.
      f. Rmax Inc; Durasheath: www.rmax.com/#sle.

g. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACCESSORIES

A. Self-Adhered Transition Flashing: Multipurpose, self-adhered flashing with modified butyl adhesive, polyester fiber top sheet, and polypropylene interlayer.
   1. Application: Primerless adhesion for use as through-wall flashings and wall transitions to roof and below-grade systems.
   2. Thickness: 45 mil, 0.045 inch, nominal.
   3. Size: 6 inches wide, in rolls 75 feet long.

B. Primer: As required by insulation manufacturer.

C. Tape: Bright aluminum self-adhering type, 2 inch wide.

D. Insulation Fasteners: Impaling clip of galvanized steel with washer retainer and clips, to be mechanically fastened to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

E. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Apply adhesive to back of boards: Per manufacturer's recomendations.

B. Install boards horizontally on foundation perimeter.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS

A. Install boards horizontally on walls.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and protrusions.

B. Extend boards over expansion joints, unbonded to wall on one side of joint.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.

B. Install boards horizontally on walls.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.05 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 21 19
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In exterior wall crevices.
   2. At junctions of dissimilar wall and roof materials.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2025.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

E. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.

F. NFPA 275 - Standard Method of Fire Tests for the Evaluation of Thermal Barriers; 2022.

G. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

H. UL 1040 - Standard for Safety Fire Test of Insulated Wall Construction; Current Edition, Including All Revisions.

I. UL 1715 - Standard for Safety Fire Test of Interior Finish Material; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

C. Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

1.05 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

B. Do not apply foam when temperature is within 5 degrees F of dew point.

PART 2 PRODUCTS

2.01 MATERIALS

A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.

a. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.

2. Thermal Resistance: R-value of 6.5, minimum, per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
3. Water Vapor Permeance: Vapor retarder; 2 perms, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
4. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
5. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
6. Basis of Design: (System requires 15 min thermal barrier).
   a. Carlisle Spray Foam Insulation; SealTite Pro Closed Cell: www.carlislesfi.com/#sle
   b. Icynene-Lapolla; Icynene ProSeal LE: www.icynene.com/#sle.
7. Other Acceptable Manufacturers: (System requires 15 min thermal barrier).
   a. BASF Corporation; WALLTITE US: www.spf.basf.com/#sle.
   b. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com/#sle.
8. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACCESSORIES

A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

B. Apply insulation by spray method, to a uniform monolithic density without voids.

C. Apply to achieve a thermal resistance R-value of 15.

D. Patch damaged areas.

E. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

F. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Installer shall keep record of batch dates, application thickness and material density.

3.05 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

SECTION 07 27 00
AIR BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air barriers.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Air barrier under exterior cladding.

B. Section 09 21 16 - Gypsum Board Assemblies: Air barrier under exterior cladding.

1.03 DEFINITIONS

A. Air Barrier: Airtight barrier made of material that is virtually air impermeable but water vapor permeable, both to amount as specified, with sealed seams and sealed joints to adjacent surfaces.

1.04 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

D. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

E. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, and limitations.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR PERMEABLE)

Contractor's choice of self-adhered or fluid applied.

A. Air Barrier Sheet, Self-Adhered:
   1. Does NOT contain asphalt.
   2. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   3. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
   4. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).
   5. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
   6. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
   7. Comply with NFPA 285 requirements for wall assembly.
   8. Seam and Perimeter Tape: As recommended by sheet manufacturer.
   9. Products:

a. Dorken Systems Inc; DELTA-VENT SA: www.dorken.com/#sle.
b. GCP Applied Technologies; Perm-A-Barrier VPS 30: www.gcpat.com/#sle.
c. Henry Company; Blueskin VP160: www.henry.com/#sle.
d. Soprema, Inc; SOPRASEAL Stick VP: www.soprema.us/#sle.
e. VaproShield, LLC; WrapShield SA - Self-Adhered: www.vaproshield.com/#sle.
f. W. R. Meadows, Inc; Air-Shield SMP: www.wrmeadows.com/#sle.
g. Substitutions: See Section 01 60 00 - Product Requirements.

B. Air Barrier, Fluid Applied: Vapor semi-permeable, elastomeric waterproofing.
1. Does NOT contain asphalt.
2. Air Barrier Coating:
a. Dry Film Thickness (DFT): 20 mil, 0.020 inch, minimum.
b. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
c. Water Vapor Permeance: 11 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method, at 73.4 degrees F.
d. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 90 days of weather exposure.
e. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
f. Comply with NFPA 285 requirements for wall assembly.
g. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
h. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
i. Products:
1) Carlisle Coatings and Waterproofing, Inc; Fire Resist Barrithane VP: www.carlisleccw.com/#sle.
2) Dow Chemical Company; DOWSIL DefendAir 200C: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
3) DuPont de Nemours, Inc; Tyvek Fluid Applied WB+ with Tyvek Fluid Applied Flashing and Joint Compound, Sealant for Tyvek Fluid Applied System, and StraightFlash: building.dupont.com/#sle.
4) GCP Applied Technologies; Perm-A-Barrier VPL 50RS UV Stable: www.gcpat.com/#sle.
5) Henry Company; Air-Bloc All Weather STPE: www.henry.com/#sle.
6) Master Builders Solutions; MasterSeal AWB 660: www.master-builders-solutions/en-us/#sle.
7) Polyguard Products, Inc; Airlok STPE WRB Spray-n-Roll: www.polyguardproducts.com/#sle.
8) Soprema, Inc; SOPRASEAL LM 204 VP: www.soprema.us/#sle.
9) Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.

B. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrate and air barrier materials.
1. Comply with NFPA 285 requirements for wall assembly.

C. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement waived if not installed on roof.
1. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready for work of this section.

B. Where existing conditions are responsibility of another installer, notify Design Professional of unsatisfactory conditions.

C. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Self-Adhered Sheets:
   1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
   2. Lap sheets shingle fashion to shed water and seal laps airtight.
   3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
   4. Use same material, or other material approved by sheet manufacturer, to seal to adjacent substrates, and as flashing.
   5. At wide joints, provide extra flexible membrane allowing joint movement.

E. Fluid-Applied Coatings or Membranes:
   1. Prepare substrate in accordance with manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
   2. Use flashing to seal to adjacent construction and to bridge joints in coating substrate.

F. Openings and Penetrations in Exterior Air Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto air barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
   3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
   4. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.04 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

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SECTION 07 42 13.23
METAL COMPOSITE MATERIAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior cladding consisting of formed metal composite material (MCM/ACM) sheet, secondary supports, and anchors to structure, attached to solid backup.

B. Matching flashing and trim.

1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Panel support framing.

B. Section 06 10 00 - Rough Carpentry: Exterior sheathing.

C. Section 07 27 00 - Air Barriers.

D. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashing components integrated with this wall system.

E. Section 07 92 00 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2026.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2025.

F. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2022a.

G. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

H. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

K. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2021).

L. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2023.

M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

N. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

O. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data - MCM Sheets: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, and finish, and:
   1. Finish manufacturer's data sheet showing physical and performance characteristics.
   2. Specimen warranty for finish, as specified herein.

C. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Specimen warranty for wall system, as specified herein.

D. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate panel numbering system.
   2. Differentiate between shop and field fabrication.
   3. Indicate substrates and adjacent work with which the wall system must be coordinated.
   4. Include large-scale details of anchorages and connecting elements.
   5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.
   6. Edge flashing details for moisture control.

E. Verification Samples: For each finish product specified, submit at least two samples, minimum size 12 inch square, and representing actual product in color.

F. Certificate: Certify that the work results of this section meet or exceed specified requirements.
   1. Dry System: Tested to AAMA 501.

G. Test Report: Submit report of full-size mock-up tests for air infiltration, water penetration, and wind performance.

H. Installer's qualification statement.

I. Testing agency's qualification statement.

J. Maintenance Data: Care of finishes and warranty requirements.

K. Executed Warranty: Submit warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.

B. Manufacturer Qualifications: Company specializing in manufacturing wall panel systems specified in this section.
   1. With not less than three years of documented experience.
   2. Approved by MCM sheet manufacturer.

C. Installer Qualifications: Company specializing in performing work of type specified in this section.
   1. Approved by wall panel system manufacturer.

D. Testing Agency Qualifications: Independent agency experienced in testing assemblies of the type required for this project and having the necessary facilities for full-size mock-up testing of the type specified.

1.06 MOCK-UP

A. Provide a mock-up for evaluation of fabrication workmanship, as part of exterior mockup specified in Section 01 43 39 - Mockup Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy-duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting, and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store in well-ventilated space out of direct sunlight.
   2. Protect from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
   3. Store at a slope to ensure positive drainage of accumulated water.
   4. Do not store in enclosed space where ambient temperature can exceed 120 degrees F.
   5. Avoid contact with other materials that might cause staining, denting, or other surface damage.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

C. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace MCM panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Composite Material (MCM) Sheet Manufacturers:
   1. 3A Composites USA; Alucobond Plus: www.alucobondusa.com/#sle.
   2. Alcoa, Inc: www.alcoa.com/#sle.
   3. ALPOLIC Materials (Mitsubishi Chemical Composites); ALPOLIC - Decorative Metals: www.alpolic-americas.com/#sle.
   4. Alucoil North America LLC; larson by Alucoil, FR Core (fire resistant): www.alucoilnorthamerica.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.
   6. Alfrex FR Metal Composite Material.

B. Wall Panel System Manufacturers:
   1. Citadel Architectural Products, Inc; Envelope 2000 Reveal (RV) System: www.citadelap.com/#sle.
   2. GreenTek: GT200.
   3. Metal Design Systems: Series 44.
   4. Petersen Aluminum Corporation; PAC-3000 CS: www.pac-clad.com/#sle.

2.02 WALL PANEL SYSTEM

A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage, or failure.
   1. Provide panel jointing and weatherseal using reveal joints and gaskets or wet sealed joints.
   2. Anchor panels to supporting framing without exposed fasteners.

B. Performance Requirements:
   1. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F to 180 degrees F without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.
   2. Wind Performance: Provide system tested in accordance with ASTM E330/E330M without permanent deformation or failures of structural members under the following conditions:
      a. Wind Loads: As indicated on Drawings.
      b. Maximum deflection of perimeter framing member of L/175 normal to plane of the wall; maximum deflection of individual panels of L/60.
      c. Maximum anchor deflection in any direction of 1/16 inch at connection points of framing members to anchors.
   3. Air Infiltration: 0.06 cfm/sq ft of wall area, maximum, when tested at 6.24 psf in accordance with ASTM E283.
   4. Water Penetration: No water penetration under static pressure when tested in accordance with ASTM E331 at a differential of 10 percent of inward acting design load, 6.27 psf minimum, after 15 minutes.
      a. Water penetration is defined as the appearance of uncontrolled water on the interior face of the wall.
      b. Design to drain leakage and condensation to the exterior face of the wall.

C. Panels: 1 inch deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
   1. Reinforce corners with riveted aluminum angles.
   2. Provide concealed attachment to supporting structure by adhering attachment members to back of panel; attachment members may also function as stiffeners.
   3. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
   4. Secure members to back face of panels using structural silicone sealant approved by MCM sheet manufacturer.
   5. Metallic Finished Panels: Maintain consistent grain of MCM sheet; specifically, do not rotate sheet purely to avoid waste.
   6. Fabricate panels under controlled shop conditions.
   7. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
   8. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
      a. Make panel lines, breaks, curves, and angles sharp and true.
      b. Keep plane surfaces free from warp or buckle.
      c. Keep panel surfaces free of scratches or marks caused during fabrication.
   9. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.
   10. For "dry" jointing, secure extrusions to returned pan edges with stainless steel rivets; provide means of concealed drainage with baffles and weeps for water that might accumulate in members of system.

2.03 MATERIALS

A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a core of extruded thermoplastic material; no foamed insulation material content.
   1. Overall Sheet Thickness: 0.157 inch, minimum.
   2. Face Sheet Thickness: 0.019 inches, minimum.

3. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
4. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
5. Flammability: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929.
6. Recycled Content: not less than 25 percent.

B. Metal Framing Members: Include sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
1. Provide material strength, dimensions, configuration as required to meet applied loads and in compliance with applicable building code.
2. Aluminum Components: ASTM B209/B209M; or ASTM B221 (ASTM B221M).
3. Recycled Content: not less than 25 percent.

2.04 FINISHES

A. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, with at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color and gloss as selected by Architect from manufacturer’s standard line.

B. Color: As selected by Design Professional from manufacturer's standard finish options.

2.05 ACCESSORIES

A. Flashing: Sheet aluminum; 0.040 inch thick, minimum; finish and color to match MCM sheet; see Section 07 62 00 for additional requirements.

B. Anchors, Clips, and Accessories: Use one of the following:
1. Stainless steel complying with ASTM A276/A276M, ASTM A480/A480M, or ASTM A666/A666M.
2. Steel complying with ASTM A36/A36M and hot-dip zinc coating to ASTM A153/A153M.
3. Steel complying with ASTM A36/A36M and hot-dip galvanized to ASTM A123/A123M, with Coating Thickness Grade of 100.

C. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 15-mil dry film thickness per coat.

D. Provide panel system manufacturer's and installer’s stainless steel accessories, including fasteners, clips, anchorage devices and attachments.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine dimensions, tolerances, and interfaces with other work.
1. Verify that weather barrier system is properly installed; see Section 07 25 00 for requirements.

B. Examine substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

C. If substrate preparation is the responsibility of another installer, notify Design Professional of unsatisfactory preparation before proceeding.

D. Notify Design Professional in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during installation.

3.03 INSTALLATION

A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.

B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.

C. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners.

D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

E. Do not form panels in field unless required by wall system manufacturer and approved by the Design Professional; comply with MCM sheet manufacturer's instructions and recommendations for field forming.

F. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.

G. Install flashings as indicated on shop drawings. At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.

H. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
   1. Variation From Plane or Location: 1/2 inch in 30 feet of length and up to 3/4 inch in 300 feet, maximum.
   2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet run, maximum.
   3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
   4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch, maximum.

I. Replace damaged products.

3.04 CLEANING

A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.

B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.

C. Remove temporary coverings and protection of adjacent work areas.

D. Clean installed products in accordance with manufacturer's instructions.

3.05 PROTECTION

A. Protect installed panel system from damage until Date of Substantial Completion.

END OF SECTION

SECTION 07 53 00
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, adhered conventional application.

B. Mechanically attached coverboard.

C. Roofing stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

A. Section 07 61 00 - Sheet Metal Roofing.

B. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

B. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).

C. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2024.

D. FM (AG) - FM Approval Guide; Current Edition.

E. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2025).

F. NRCA (RM) - The NRCA Roofing Manual; 2024.

G. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of associated counterflashings installed under other sections.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, mechanical fastener layout, and walkway pad layout.

D. FM Global Acceptance Letter: Submit FM Global form X-2688 - "Application for Acceptance of Roof System" to FM Global for review and acceptance. After receiving acceptance, submit copy to Operator.

E. Installer's qualification statement.

F. Warranty: Submit manufacturer warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with NRCA (WM) and manufacturer's recommendations.

B. Installer Qualifications: Company approved by manufacturer with documented recognition for providing quality installations of on large, complex and challenging project types; Manufacturers recognitions programs: Carlisle/FleeceBack Champion Club, Versico/VIP Award, Holcim Elevate Master Contractor Program. Carlisle/ESP Status, Versico/Excalibur King’s Court Status, Holcim Elevate Master Contractor.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

B. Store materials in weather protected environment, clear of ground and moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

D. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

E. The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. Safety shall be the responsibility of the roofing contractor. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

1.09 WARRANTY

A. Correct defective work within a two year period after Date of Substantial Completion.

B. Provide 25 year manufacturer's material and labor warranty to cover failure to prevent penetration of water.
   1. Exceptions are not Permitted:
      a. Damage due to wind of speed up to 72 mph measured 10 meters above ground.

C. Provide 5 year installation warranty, certified on a form furnished by the Owner. Warranty shall include:
   1. Roofing membrane
   2. Flashing and counter-flashing
   3. Insulation and cover board
   4. Vapor barrier
   5. Fasteners and adhesives
   6. Sealants and caulking
   7. Walkway mats and pavers
   8. Roofing accessories, as required, making a complete roofing system.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EPDM Membrane Materials:
   1. Carlisle SynTec Systems; Sure-Seal EPDM: www.carlisle-syntec.com/#sle.
   2. Elevate; RubberGard Max (Reinforced) EPDM Membrane: www.holcimelevate.com/#sle.
   3. Versico Roofing Systems; VersiGard EPDM: www.versico.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulation: As recommended or approved by the membrane manufacturer and included in the total system warranty.
   1. Carlisle SynTec Systems: www.carlisle-syntec.com/#sle.
   2. Elevate: www.holcimelevate.com/#sle.

3. Versico, a division of Carlisle Construction Materials Inc: www.versico.com/sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ROOFING

A. Elastomeric Membrane Roofing: One ply membrane, fully adhered over coverboard.

B. Roofing Assembly Requirements:
1. Roof Covering External Fire Resistance Classification: UL (DIR) certified Class A.
2. Factory Mutual Classification: Class 1 and windstorm resistance of 1-120 SH (severe hail), in accordance with FM DS 1-28.
3. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.
4. Air tightness: 0.04 CFM/SF, maximum, when subjected to a uniform static air pressure of 1.57 psf.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); non-reinforced; complying with minimum properties of ASTM D4637/D4637M.
1. Thickness: 0.060 inch.
2. Sheet Width: 120 inch, minimum; factory-fabricate into largest sheets possible.
3. Color: Gray.
4. Tensile Strength: 1305 psi, measured in accordance with ASTM D412.
5. Ultimate Elongation: 300 percent, measured in accordance with ASTM D412.
6. Tear Strength: 150 lbf per inch, measured in accordance with ASTM D624.
7. Brittleness Temperature: -49 degrees F, measured in accordance with ASTM D746.

B. Seaming Materials: 6" wide by 100' long splice tape used for splicing adjoining sections of EPDM membrane, or as recommended by membrane manufacturer.

C. Flexible Flashing Material: Same material as membrane.
1. Color: Gray.

2.04 COVER BOARDS

A. Cover Boards: Faced and with high compressive strength polyisocyanurate (ISO) insulation complying with ASTM C1289.
1. Board Thickness: 1/2 inch.
2. Products: Equal to Secureshield HD Polyiso Coverboard.

2.05 ACCESSORIES

A. Prefabricated Roofing Expansion Joint Flashing: Sheet butyl over closed-cell foam backing seamed to galvanized steel flanges.

B. Roof-to-Roof Expansion Joint: Slip plate type with gap at insulation and cover board.

C. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
1. Provide also at mechanical screen posts, with stainless steel clamping rings.

D. Membrane Adhesive: As recommended by membrane manufacturer.

E. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

F. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

G. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.

H. Termination Bars: Stainless steel bars, 1 inch wide by 1/8 inch thick, pre-punched at 4 inches oc for fastening to substrate.

I. Sealants: As recommended by membrane manufacturer.

J. Sealer: Pourable type sealer; compatible with the roofing membrane and recommended by the roofing manufacturer.

K. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
   1. Size: 30 by 30 inch, minimum

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 INSULATION - UNDER MEMBRANE

A. Attachment of Insulation (typical):
   1. Mechanically fasten insulation in accordance with roofing and insulation manufacturer's instructions, typical, high roof.
   2. Embed insulation into full bed of adhesive accordance with roofing and insulation manufacturer's instructions[<>], storm shelter, precast concrete deck locations.

B. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

C. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

D. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

E. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 24 inches.

F. Do not apply more insulation than can be covered with membrane in same day.

3.03 INSTALLATION - MEMBRANE

A. Install elastomeric membrane roofing system in accordance with manufacturer's recommendations and NRCA (WM) applicable requirements.

B. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

C. Shingle joints on sloped substrate in direction of drainage.

D. Fully Adhered Application: Apply adhesive to substrate at rate recommended by manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

E. Overlap edges and ends and seal seams by tape or manufacturer’s equivalent recommended system, minimum 6 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

F. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 12 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to reglets.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Install roofing expansion joints where indicated. Make joints watertight.
   1. Install prefabricated joint components in accordance with manufacturer's instructions.

I. Install roof-to-roof expansion joint assembly where indicated on drawings. Assembly shall meet roofing membrane manufacturer's requirements for installation and warranty, shall be watertight and not impede water shed directed over the surface of the joint.

J. Coordinate installation of roof drains and sumps and related flashings.

K. Install roof membrane or flexible roof flashing to air barrier material in wall construction, lap and seal to provide continuity of the air barrier plane.

3.04 INSTALLATION - MEMBRANE FINISH COATING/COVER

A. Install walkway pads. Space pad joints to permit drainage. Install walkway products at roof ladders, at hatches and doors to roof, around mechanical equipment; below downspouts, and in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.05 RELATED WORK

A. A Sheet Metal Constructor shall fabricate and install all roof related sheet metal flashings and trim. No roofing personnel shall be allowed to fabricate or install roof related sheet metal.

B. Sealants used in conjunction with roof related sheet metal shall receive a sealant primer and the sealant color shall match that of the adjacent sheet metal.

C. Abandoned or unused equipment and materials shall be removed on re-roofing projects.

3.06 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Remove bituminous markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

D. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

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SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, and drainage components.

B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood nailers for sheet metal work.

B. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

C. Section 08 63 00 - Metal-Framed Skylights: Integral metal curbs.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2026.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM D523 - Standard Test Method for Specular Gloss; 2014 (Reapproved 2018).

E. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2021.

F. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2007 (Reapproved 2015).

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

B. Samples: Submit two samples 3 by 4 inch in size illustrating metal finish color.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.

B. Fabricate and install roof edge profiles to comply with ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 20 years:
   1. Chalking: No more than that represented by a No. 8 rating based on ASTM D4214.
   2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
   3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 20 gauge, 0.032 inch thick base metal, shop pre-coated with PVDF coating.
   1. Gutters and downspouts: 24 gauge, 0.0239 inches allowed.
   2. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   3. Color: Custom, to match approved sample.

B. Stainless Steel: ASTM A666/A666M, Type 316 alloy, soft temper, 28 gauge, 0.0156 inch thick; smooth No. 04 Satin finish.

2.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
   1. Provide custom profiles where indicated.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with batten seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

G. Fabricate roof edge copings and flashings to comply with ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

2.03 ACCESSORIES

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolt, and other suitable fasteners designed to withstand design loads.
   1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
   2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed with hex washer heads.
   3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
   4. Use fasteners of sizes that will penetrate substrate not les than 1-1/4 inches for nails and not less than 3/4 inch for wood screws. Use stainless steel fasteners.
   5. Neoprene washers

C. Underlayment: ASTM D226/D226M, organic roofing felt, Type I (No. 15).

D. Primer: Zinc chromate type.

E. Protective Backing Paint: Zinc molybdate alkyd, 15 mils DFT minimum.

F. Concealed Sealants: Non-curing butyl sealant.

G. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

H. Reglets: Surface mounted type, galvanized steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Insert flashings into reglets to form tight fit; secure in place with plastic wedges; seal flashings into reglets with sealant.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

D. Apply plastic cement compound between metal flashings and felt flashings.

E. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

F. Seal metal joints watertight.

3.04 SCHEDULE

A. Gutters and Downspouts: prefinished galvanized steel.

B. Counterflashings at Roofing Terminations (over roofing base flashings): prefinished galvanized steel.

C. Counterflashings at Curb-Mounted Roof Items: pre-finished galvanized steel.

D. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports: Stainless Steel: 0.0187 inch thick.

E. Roof-Drain Flashing: Stainless Steel: 0.0156 inch, unless heavier gauge is required for roofing warranty.

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SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: Cutting and patching.

B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
   1. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2024.

C. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a, with Editorial Revision (2024).

D. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

E. FM (AG) - FM Approval Guide; Current Edition.

F. FM 4991 - Examination Standard for Firestop Contractors; 2026.

G. ITS (DIR) - Directory of Listed Products; Current Edition.

H. UL (FRD) - Fire Resistance Directory; Current Edition.

I. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
   1. VOC Data: provide printed statement of VOC content of non-preformed sealants

D. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated, ASTM E119, and ASTM E814.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
   2. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. Trained by manufacturer.

2. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
3. Verification of at least five satisfactorily completed projects of comparable size and type.
4. Licensed by local authorities having jurisdiction (AHJ).

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers: Provide firestopping products by a single manufactuerer for the entire project.
1. 3M Fire Protection Products: www.3m.com/firestop/#sle.
2. A/D Fire Protection Systems Inc: www.adfire.com/#sle.
3. Hilti, Inc: www.us.hilti.com/#sle.
4. Specified Technologies Inc: www.stifirestop.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Mold and Mildew Resistance: Provide firestopping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

D. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 “Performance Requirements” Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated.

C. Low Emitting Materials: meet VOC Content Restrictions criteria.

2.04 MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specified diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillow/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
   1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
   2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
   3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.05 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.

B. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.

C. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.06 FIRESTOPPING SYSTEMS

A. Firestopping:
   1. Fire Ratings: See drawings for required ratings.

B. Firestopping at Uninsulated Metallic Pipe and Conduit Penetrations, of diameter 4 inches or less: Any material meeting requirements.
   1. Available UL-Classified Systems: C-BJ-2001-2999 and W-L-2001-2999.

C. Firestopping at Insulated Pipes, of diameter 4 inches or less: Any material meeting requirements.
   1. Available UL-Classified Systems:C-BJ-5001-5999 and W-L-5001-5999.

D. Firestopping at Cable Tray Penetrations: Any material meeting requirements.
   1. Available UL-Classified Systems:W-L-4001-4999.

E. Firestopping at Cable Penetrations, not in Conduit or Cable Tray: Any material meeting requirements.

1. Available UL-Classified Systems: C-BJ-3001-3999, W-L-6001-6999 and W-L-3001-3999.

F. Firestopping at Control Joints (without Penetrations): Any material meeting requirements.
   1. Available UL-Classified Systems: C-BJ-0001-0999 and W-L-0001-0999.

G. Firestop Systems for Miscellaneous Penetrants: Any material meeting requirements.
   1. Available UL-Classified Systems:W-J-7001-7999 and W-L-7001-7999.

H. Firestop Systems for Groupings of Penetrants: Any material meeting requirements.
   1. Available UL-Classified Systems:C-BJ-8001-8999 and W-L-8001-8999.

2.07 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

B. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to arrest liquid material leakage.

3.03 COORDINATION

A. Coordinate construction of openings, penetrations and construction joiunts to ensure that the fire stop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

3.04 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

3.05 IDENTIFICATION

A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, pre-printed vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
   1. The words "Warning: Through Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address and phone number.
   3. Through-penetration firestop system designation of applicable testing and inspecting agency.

4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

3.06 FIELD QUALITY CONTROL

A. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.07 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.08 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 84 00 - Firestopping: Firestopping sealants.

B. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

B. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2024.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.

G. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Installation Log: Submit filled out log for each length or instance of sealant installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

B. Field Quality Control Plan:
   1. Visual inspection of entire length of sealant joints.

C. Field Adhesion Test Procedures:
   1. Allow sealants to fully cure as recommended by manufacturer before testing.
   2. Have a copy of the test method document available during tests.
   3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.

4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Design Professional.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.
   1. For silicone sealants within 20 years.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve airtight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. ADFAST Corporation: www.adfastcorp.com/#sle.
   2. Adhesives Technology Corporation: www.atcepoxy.com.
   3. Bostik Inc: www.bostik-us.com.
   4. Chem Link, Inc: www.chemlinkinc.com.
   5. Dow Corning Corporation: www.dowcorning.com/construction/sle.
   6. Everkem Diversified Products, Inc: www.everkemproducts.com/#sle.
   7. Fortifiber Building Systems Group: www.fortifiber.com/sle.
   8. Franklin International, Inc: www.titebond.com.
   9. Hilti, Inc: www.us.hilti.com/#sle.
   10. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us/#sle.
   11. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com/sle.
   12. Pecora Corporation: www.pecora.com/?sle.
   13. The QUIKRETE Companies: www.quikrete.com.
   14. Sherwin-Williams Company: www.sherwin-williams.com.
   15. Sika Corporation: www.usa-sika.com.
   16. Specified Technologies Inc: www.stifirestop.com/#sle.
   17. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   18. W.R. Meadows, Inc: www.wrmeadows.com/sle.
   19. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.03 NONSAG JOINT SEALANTS

A. Type General Purposed Exterior Sealant -Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M, G, O and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   5. Color: To be selected by Design Professional from manufacturer's standard range.
   6. Service Temperature Range: Minus 20 to 180 degrees F.
   7. Applications:

a. Wall expansion and control joints.
b. Joints between door, window, and other frames and adjacent construction.
c. Control, expansion, and soft joints in masonry.
d. Joints between concrete and other materials.

8. Manufacturers:
   a. ADFAST Corporation; ADSEAL DWS 4580 Series: www.adfastcorp.com/#sle.
   b. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
   c. Pecora Corporation; Pecora 864 NST (Non-Staining Technology): www.pecora.com/#sle.
   d. Sika Corporation; Sikasil WS-290: www.usa-sika.com/#sle.
   e. Tremco Commercial Sealants & Waterproofing; Spectrem 2: www.tremcosealants.com/#sle.
   f. Substitutions: See Section 01 60 00 - Product Requirements.

B. Type Sanitary Sealant -Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   1. Color: Color to be selected by Architect. Provide "clear" as an option.
   2. Applications:
      a. Joints between plumbing fixtures and floor and wall surfaces.
      b. Joints between countertops with sinks and adjacent wall surfaces.
      c. Joints between bathroom casework base and flooring.
      d. Joints in areas subjected to moisture.
   3. Manufacturers:
      a. BASF Building Systems; Omniplus.
      b. Dow Corning Corporation; 786 Mildew Resistant.
      c. GE Advanced Materials - Silicones; Sanitary SCS1700.
      d. Pecora Corporation; 898 Silicone: www.pecora.com.
      e. Sika Corporation; Sikasil GP: www.usa-sika.com/#sle.
      f. Tremco Incorporated; Tremsil 200 Sanitary.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

C. Type - General Purpose Interior Sealant -Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: Standard colors matching finished surfaces, Type OP (opaque), or paintable
   2. Grade: ASTM C834; Grade - NF.
   3. Applications:
      a. Interior wall and ceiling control joints in non-wet areas.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Other interior joints for which no other type of sealant is indicated.
   4. Manufacturers:
      a. BASF: Sonolac.
      b. Hilti, Inc: www.us.hilti.com/#sle.
      c. Pecora Corporation: www.pecora.com/#sle.
      d. Specified Technologies Inc; AC-20 + Silicone: www.stifirestop.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Type Interior Acoustic Sealant -Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: Standard colors matching finished surfaces, Type OP (opaque), or paintable
   2. Grade: ASTM C834; Grade - NF.
   3. Applications:
      a. Interior wall and ceiling control joints in non-wet areas.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Other interior joints for which no other type of sealant is indicated.

4. Manufacturers:
    a. Acoustical Surfaces, Inc: S.T.O.P. Noise (Professional Series)
    b. Franklin International, Inc; Titebond GREENchoice Acoustical Smoke & Sound Sealant: www.titebond.com/#sle.
    c. Hilti, Inc; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com/#sle.
    d. Master Builders Solutions by BASF; MasterSeal NP 520: www.master-builders-solutions.basf.us/en-us/#sle.
    e. Owens Corning: QuietZone
    f. Pecora Corporation; AIS-919 Acoustical and Insulation Latex Sealant: www.pecora.com/#sle.
    g. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
    h. Specified Technologies Inc; Smoke N' Sound Acoustical Sealant: www.stifirestop.com/#sle.
    i. Top Gun, a brand of PPG Architectural Coatings; Top Gun 200: www.ppgpaints.com/#sle.
    j. Tremco Commercial Sealants & Waterproofing; Tremstop Smoke and Sound: www.tremcosealants.com/#sle.
    k. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
    1. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates and joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   1. Width/depth ratio of 2:1.
   2. Neck dimension no greater than 1/3 of the joint width.
   3. Surface bond area on each side not less than 75 percent of joint width.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Do not seal the following types of joints.
   1. Intentional weepholes in masonry.
   2. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   3. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   4. Joints where installation of sealant is specified in another section.
   5. Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.

I. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

J. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION OF FINISHED WORK

A. Protect sealants until cured.

3.06 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

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SECTION 08 03 00
CONSERVATION TREATMENT FOR GLAZED OPENINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cleaning of existing glazed openings; skylight.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:

1. Cleaning Compounds and Solutions: Physical characteristics and manufacturer's recommendations.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Avoid humidity build-up under coverings. Prevent corrosion of metals and damage to factory-applied painted finishes.

B. Protect factory finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.04 FIELD CONDITIONS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of metal period treatment work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of metal period treatment work.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

A. Mineral Spirits: Petroleum distillate solvent.

B. Pumice Powder: Powder made from refined naturally calcined volcanic glass foam.

C. Glass Cleaner: Standard commercially available ammonia-based cleaning solution.

D. Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts, organic matter, or other deleterious materials.

E. Clean, soft, lint-free cloths.

F. Stiff-bristle brushes.

2.02 TEMPORARY EXTERIOR OPENING PROTECTION MATERIALS

A. Contractor shall provide temporary protection of exterior openings as required for execution of this work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to be cleaned are ready for work of this section.

3.02 PREPARATION - IN SITU RESTORATION

A. Protect surrounding elements from damage due to restoration procedures.

B. Remove or dismantle and store removable items located in areas to be cleaned including, but not limited to, fixtures, fittings, finish hardware, and accessories; reinstall upon completion of cleaning work.

C. Separate areas to be protected from cleaning areas to prevent damage.

D. Mask or cover adjacent surfaces and permanent equipment. Secure coverings without tapes that leave residue, or nails. Do not use impervious sheeting which produces condensation.

1. Use materials that will withstand cleaning procedures.

E. When using liquid cleaning methods, install drainage devices to prevent runoff over adjacent surfaces, unless those surfaces are impervious to damage from runoff.

F. Do not allow cleaning runoff to drain into sanitary or storm sewers.

G. Do not attach scaffolding, ladders, or working platforms to the building.

3.03 CLEANING

A. Immediately remove stains resulting from the work of this section.

B. Clean surrounding surfaces.

C. Aluminum Framing: Clean both interior and exterior surfaces.

D. Glazing: Clean both interior and exterior surfaces.

E. Glazing: At completion of project, remove protective coverings and reclean soiled surfaces using indicated procedures and materials.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Detention security hollow metal doors and frames.

F. Bullet-resistant hollow metal doors and frames.

G. Tornado-resistant hollow metal doors and frames.

H. Hollow metal borrowed lites glazing frames.

I. Accessories, including glazing and matching panels.

1.02 RELATED REQUIREMENTS

A. Section 01 23 00 - Alternates: Alternate #1: Add Storm Shelter Addition.

B. Section 06 10 00 - Rough Carpentry: Blocking.

C. Section 07 92 00 - Joint Sealants.

D. Section 08 14 16 - Flush Wood Doors.

E. Section 08 56 59 - Service and Teller Window Units.

F. Section 08 71 00 - Door Hardware.

G. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

H. Section 10 26 00 - Wall and Door Protection.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. SDI: Steel Door Institute.

C. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2026.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

I. ASTM C143/C143M - Standard Test Method for Slump of Concrete; 2026a.

J. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

L. ASTM F1450 - Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention and Correctional Facilities; 2012a (Reapproved 2019).

M. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

N. FEMA P-361 - Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms; 2024.

O. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.

P. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters; 2020.

Q. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

R. ITS (DIR) - Directory of Listed Products; Current Edition.

S. Miami (APD) - Approved Products Directory; Miami-Dade County; Current Edition.

T. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

U. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.

V. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.

W. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

X. NAAMM HMMA 863 - Guide Specifications for Detention Security Hollow Metal Doors and Frames; 2024.

Y. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

Z. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

AA. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2026.

BB. UL (DIR) - Online Certifications Directory; Current Edition.

CC. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

DD. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of experience.

C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Hollow Metal Doors and Frames:
   1. Ceco or Curries, an Assa Abloy Group company: www.assaabloydss.com.
   2. Mesker, dormakaba Group; FDJ Series Drywall Frames: www.meskeropeningsgroup.com/#sle.
   3. Republic Doors: www.republicdoor.com.
   4. Steelcraft, an Allegion brand: www.allegion.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Exterior Hollow Metal Doors and Frames:
   1. Ceco or Curries, an Assa Abloy Group company: www.assaabloydss.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Bullet-Resistant and Detention Security Hollow Metal Doors and Frames:
   1. Fleming Door Products, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Krieger Specialty Products: www.kriegerproducts.com/#sle.
   3. Mesker, dormakaba Group: www.meskeropeningsgroup.com/#sle.
   4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   5. Security Metal Products Corporation, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   6. Overly Door Company: www.overly.com/#sle.
   7. Basis of Design: Total Security Solutions: https://security.tssbulletproof.com.
   8. Substitutions: See Section 01 60 00 - Product Requirements.

D. Tornado-Resistant Hollow Metal Doors and Frames:
   1. Curries: StormPro; www.curries.com.
   2. Krieger Specialty Products: www.kriegerproducts.com/#sle.
   3. Megamet Industries, Inc; MegaStorm Hurricane and Tornado Doors: www.megametusa.com/#sle.
   4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Beveled, both sides.
   5. Typical Door Face Sheets: Flush. Smooth, seamless, joints mitered, interlocked, welded and ground smooth.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Flush.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

a. Steel Door and Frame Reinforcing:
1) Minimum 7 gauge steel of equivalent thread depth for hinges.
2) Minimum 12 gauge steel for other hardware.

8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Hollow Metal Panels (where indicated): Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

D. Frame Depth: coordinate frames with wall depths indicated. Typical frames shall provide 1/2 inch returns, but some frames in existing walls may not be full depth. Refer to drawings and details.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 2 - Seamless.
d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
3. U value: 0.36, measured in accordance with ASTM C1363/ NFRC 102-2014
4. Air Infiltration: Less than 0.1 cfm/sf measured in accordance with ASTM EE283/ NFRM 400-2014.
5. Must use with thermally broken frame and thermal saddle to achieve above values.
6. Door Thickness: 1-3/4 inches, nominal.
7. Weatherstripping: Refer to Section 08 71 00.

C. Interior Doors, Non-Fire Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 2 - Heavy-duty.
b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 2 - Seamless.
d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Core Material: Vertical steel stiffeners, sound insulation core..
3. Door Thickness: 1-3/4 inches, nominal.

D. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 2 - Heavy-duty.
b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 2 - Seamless.
d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.

2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
    a. Attach fire rating label to each fire rated unit.
4. Core Material: Mineral board.
5. Door Thickness: 1-3/4 inches, nominal.

E. Detention Security and Bullet-Resistant Doors; Interior:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 3 - Extra Heavy-duty.
    b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 2 - Seamless.
    d. Door Face Metal Thickness: 14 gauge, 0.067 inch, minimum.
2. Detention Security Facility Swinging Door Assemblies: Comply with Grade 3 security characteristics, in accordance with NAAMM HMMA 863 and ASTM F1450 requirements.
3. Bullet Resistance: UL 752, Threat Level Rating - Level 3.
4. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
5. Door Thickness: As required to meet requirements indicated.
6. Hinge Rail and Reinforcement: Non-beveled edge, reinforced with continuous steel channel, 12 gauge, 0.093 inch minimum metal thickness, welded at 5 inch on center maximum, and compatible with 4-1/2 inch full mortise template and continuous geared hinges.

F. Tornado-Resistant Doors: Provide fire-rated door construction as indicated for Fire-Rated Doors, and the following door requirements.
1. Design and size door and frame components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M.
    a. Design Wind Loads: Comply with requirements of authorities having jurisdiction.
    b. Wind-Borne Debris Resistance: Door and frame components shall have FLA (PAD) approval, Miami (APD) approval, or UL (DIR) approval for Large and Small Missile impact and pressure cycling at design wind loads.
2. Tornado Shelter Application: Comply with ICC 500 standard.
    a. Commercial: Designed and tested to comply with FEMA P-361 community shelter door assembly guidelines.
3. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 4 - Maximum-duty.
    b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 1 - Full Flush.
    d. Door Face Metal Thickness: 14 gauge, 0.067 inch, minimum.
    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
4. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
5. Door Thickness: 1-3/4 inches, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. General:
1. Comply with the requirements of grade specified for corresponding door.
    a. ANSI A250.8 Level 3 door and Doors over 4’-0” wide: 14 gauge frames.

b. Other doors: 16 gauge.
2. Face Width: 2 inches, unless otherwise indicated.
3. Frame Depth: Coordinate to fit actual wall thicknesses, including masonry, plus 1/2-inch wrap each side.
4. Frame Profile: Double rabbet, unless otherwise indicated.
5. Hospital / Terminated Stops: not required
6. Knock-down frames are prohibited.

D. Exterior Door Frames: Fully welded. Thermal break frame incorporating a bonded thermal break with compression type weather-stripping.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
3. Provide thermal anchors, and use with energy efficient door and thermal saddle
4. Weatherstripping: Separate, see Section 08 71 00.

E. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

F. Door Frames, Fire-Rated: Full profile/continuously welded type.
1. Fire Rating: Same as door, labeled.
2. For interior fire-rated frames in masonry walls, which will be grouted, provide galvannealed frames instead of bituminous coating

G. Bullet-Resistant Door Frames: Comply with UL 752, with same level of bullet resistance as door; face welded construction, ground smooth, fully prepared and reinforced for hardware installation.

H. Commercial and/or Detention Security-Resistant Door Frames: With same security resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.

I. Tornado-Resistant Door Frames: With same tornado resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
1. Frame Metal Thickness: 12 gauge, 0.093 inch, minimum.

J. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

K. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

L. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

M. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

N. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

O. Four-Sided Frames: Provide four-sided frames as identified in the Door Schedule; provide anchoring on all four sides.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.06 ACCESSORIES

A. Glazing: As specified in Section 08 80 00, factory installed.

B. Removable Stops: Formed sheet steel, rectangular , mitered corners; prepared for countersink style tamper proof screws.

C. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

D. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
   1. Coordinate with painter so that silencers are not painted.

E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

F. Body Filler for repair of existing door frames: repair putty for filling dents and gouges in galvanized and non-galvanized hollow metal doors and frames; Bondo All-Purpose Putty by 3M or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of non-rated frames to be installed in concrete, masonry or to be grouted, with bituminous coating 1/16-inch thick, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Install door hardware as specified in Section 08 71 00.
   1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

F. Coordinate installation of electrical connections to electrical hardware items.

G. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Adjust sound control doors so that seals are fully engaged when door is closed.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

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SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors (DR); flush and flush glazed configuration; fire rated and non-rated.

B. Bullet resistant wood doors.

1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 56 59 - Service and Teller Window Units.

C. Section 08 71 00 - Door Hardware.

D. Section 08 80 00 - Glazing.

E. Section 09 21 16 - Gypsum Board Assemblies: Bullet-resistant sheathing and wallboard for bullet-resistant partitions and walls.

1.03 REFERENCE STANDARDS

A. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2018).

B. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

C. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

D. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

E. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

F. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

G. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Samples: Submit two samples of door veneer, 6 by 6 inch in size illustrating wood grain, stain color, and sheen.

E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

F. Test Reports: Show compliance with specified requirements for the following:
   1. Bullet resistant doors and frames.

G. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 PROJECT CONDITIONS

A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors: Provide Basis of Design manufacturer listed, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty:
   1. Forte Opening Solutions: www.forteopenings.com/#sle.
   2. Algoma Hardwoods: www.algomahardwoods.com.
   3. Eggers Industries: www.eggersindustries.com.
   4. Graham Wood Doors: www.grahamdoors.com.
   5. VT Industries: www.vtindustries.com..
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Bullet Resistant Wood Doors:
   1. Overly Door Company: www.overly.com/#sle.
   2. Basis of Design: Total Security Solutions: https://security.tssbulletproof.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Premium Grade, Heavy Duty performance, in accordance with AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
   3. Mineral core doors are not accepted.
   4. Finished doors shall not contain knots.
   5. No added urea-formaldehyde.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at all locations.
   2. Fire Rated Doors: Tested to ratings as indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc. (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Smoke and Draft Control Doors: In addition to required fire rating, provide door assemblies tested in accordance with UL 1784 with maximum air leakage of 3.0 cfm per sq ft of door opening at 0.10 inch wg pressure at both ambient and elevated temperatures for "S" label; if necessary, provide additional gasketing or edge sealing.
   4. Smoke and Draft Control Doorslocated in smoke partitions: In addition to required fire rating, provide flush wood door assemblies in compliance with WDMA I.S. 1A requirements for "S" label; no additional gasketing or edge sealing allowed.
   5. Bullet Resistant Doors: UL 752, Level 3.
   6. Wood veneer facing with factory transparent finishto match Architect's sample.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire-Rated Doors: Fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

C. Bullet Resistant Doors: Equivalent to type, with bonded particleboard core (PC); rating; plies and faces as indicated above.
   1. Bullet Resistant Wall Assemblies: See Section 09 21 16.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: White Maple, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, center balance match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Same species as face veneer; lumber or veneer (ME), or compatible hardwood (CE), sanded ease; visible joints allowed on hinge edge.
   2. "Running Match" each pair of doors and doors in close proximity to each other.

B. Cross Banding Behind High Pressure Laminate Finish: 1 ply; of manufacturer's standard material.

C. Facing Adhesive: Type I - waterproof.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   2. Provide solid blocking for other through-bolted hardware.

C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
   1. Transparent:
      a. System - TR-6, Catalyzed Polyurethane.
      b. Sheen: Satin.

B. Factory finish doors in accordance with approved sample.

C. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Hollow Metal Door Frames: See Section 08 11 13.

B. Glazing: See Section 08 80 00.

C. Glazing Stops: Wood, of same species as door facing, mitered corners; prepared for countersink style tamper proof screws.

D. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
   2. Install smoke and draft control doors in accordance with NFPA 105 requirements.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 56 53
INTERIOR AND EXTERIOR SECURITY ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wind and impact security view windows, with glazing. (Storm Shelter Windows)

B. Prefabricated bullet resistant fixed transaction windows.

C. Prefabricated bullet resistant aluminum exterior windows and entrance doors.

1.02 RELATED REQUIREMENTS

A. Section 01 23 00 - Alternates: Alternate #1: Add Storm Shelter Addition.

B. Section 01 23 00 - Alternates: Alternate #3: Add First Floor Bullet Resistant Fenestration.

C. Section 03 30 00 - Cast-in-Place Concrete: Installation of anchorage items embedded in concrete.

D. Section 05 12 00 - Structural Steel: Structural tubes for attachment.

E. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

F. Section 08 11 13 - Hollow Metal Doors and Frames: Bullet-resistant hollow metal doors and frames.

G. Section 08 11 13 - Hollow Metal Doors and Frames: Tornado-resistant hollow metal doors and frames.

H. Section 09 21 16 - Gypsum Board Assemblies: Bullet-resistant sheathing and wallboard for bullet-resistant partitions and walls.

I. Section 09 90 00 - Painting: Field painting.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2026.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Furnish anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, to be embedded into concrete or masonry, with setting diagrams and installation, to applicable installer in time for installation.

B. Preinstallation Meeting: Prior to start of installation arrange a meeting on site to familiarize installer and installers of related work with requirements relating to this work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's published data showing materials, construction details, dimensions of components, and finishes.

C. Shop Drawings: Drawings prepared specifically for this project, showing plans, elevations, sections, details of construction, anchorage to other work, hardware, and glazing.
   1. For existing openings show verified field dimensions.
   2. For new work show required opening dimensions and allowance for field deviation.
   3. Indicate configuration, sizes, mounting, anchors and fasteners.
   4. For field glazed windows, include detailed instructions for glazing installation.

D. Product Certificates: Indicating compliance with ICC 500 - 2020 requirements.

E. Test Reports: Test reports for specific window model and glazing to be furnished, showing compliance with specified requirements; window and glazing may be tested separately, provided window test sample adequately simulates the glazing to be used.
   1. Include testing agency qualifications.

F. Samples: Provide glazing samples to match existing building window tint for storm rated and bullet resistant insulated gazing units to design professional selection.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm with at least 5 years experience in the manufacture of windows of the type specified and able to provide test reports showing that their standard manufactured products meet the specified requirements; custom designed products not acceptable.

B. Testing Agency Qualifications: Independent testing agency able to show experience in conducting tests of the type specified.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Provide manufacturer's warranty agreeing to repair or replace windows and window components that fail within three years after Date of Substantial Completion due to, but not limited to, the following:
   1. Structural failure, failure of welds, and deterioration of metals and finishes beyond that expected under detention use and normal weathering.
   2. Failure of glazing due to excessive deflection of supporting members under wind load.

C. Provide 10 year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide 10 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wind and Impact Security View Windows:
   1. Basis of Design: InsulgardSTORMDEFEND TTH600 Tornado and Hurricane Storm Shelter Window System.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wind and Impact Security Glazing:
   1. Basis-of-Design: TOR-GARD 30 IG.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Bullet Resistant Fixed Transaction Windows:
   1. Basis-of-Design: Total Security Solutions; Bullet Resistant Horizontal Baffle Window: www.tssbulletproof.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

D. Bullet Resistant Aluminum Exterior Windows and Entrance Doors: Alternate No. 3.
   1. Basis-of-Design: Total Security Solutions; Bullet Resistant Storefront Doors and Windows: www.tssbulletproof.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ASSEMBLIES

A. Security Windows:
   1. Dimensions, profiles, features, and performance specified and indicated on drawings are required; do not deviate unless specifically approved by Design Professional under substitution procedures; see Section 01 60 00.
   2. Design to fit openings indicated on drawings; design to accommodate deviation of actual construction from dimensions indicated on drawings.
   3. Fabricate frames and sash with corners mitered or coped full depth with concealed welded joints.

4. Design anchorages to provide performance equivalent to that required for window unit; provide anchorages at least equivalent to those by which the tested units were anchored to the test frame.
5. Separate dissimilar metals to prevent corrosion by galvanic action by painting contact surfaces with primer or with sealant or tape recommended by manufacturer for the purpose.
6. Weld components before finishing and in concealed locations, to greatest extent possible; minimize distortion and discoloration of finish; remove residue of welding; grind exposed welds smooth and finish to match.
7. Label units to indicate which side is which, such as inside/outside or secure/non-secure; use labels that are removable after installation but durable enough not to be lost during delivery, storage, handling, and installation.

2.03 WIND AND IMPACT SECURITY VIEW WINDOWS

A. Factory fabricated framing constructed from either 6005-T5 or 6105-T5 extruded aluminum with integral weep design to allow water to vent to the exterior along horizontal members. Thermal separation of frame using polyamide strip.

B. Dimensions:
1. Head, Jamb, and Sill Members: 2-1/2 inches by 6 inches.
2. Mullion and Intermediate Horizontal Members: 3-1/4 inch face.

C. Unit to be permanently marked with certification label of the certified testing agency acceptable to the authorities having jurisdiction. Label to include:
1. Design Pressure
2. Tested Pressure
3. Missile Criteria
4. ICC-500 (2020) Certification Listing

D. Performance Criteria:
1. Type of Shelter: Tornado.
2. Design Wind Speeds: 250 MPH.

E. Ballistic Resistant: Level 3 in accordance with UL 752 – Standard for Bullet-Resisting Equipment.

F. Energy Performance: Certify and label energy performance according to NFRC as follows:
1. NFRC Model Size: 47-1/4 by 59 inches
2. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.37 as determined according to NFRC 100.
3. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.45 as determined according to NFRC 200.
4. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 60 as determined according to NFRC 500.

G. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members

H. Glazing Material (ICC 500): Insulating Glass Clad Polycarbonate.
1. Rating: Wind, Impact and Level 3 Ballistic Resistant Glazing.
2. Tint: Match existing glazing.

2.04 BULLET RESISTANT FIXED TRANSACTION WINDOWS

A. Security Transaction Windows: Factory-assembled fixed glazing panel reglazable from secure side without disassembly of frame, with non-removable trim and glazing stops on non-secure side.

B. Window Type: Fixed horizontal Baffle.
1. Window Size: Custom, As indicated on drawings.

2. Size of Counter Space: As indicated on drawings.
3. Material: Bullet Resistant Level 3 (minimum), aluminum frame or composite aluminum and fiberglass insert frame, track, valance and channels.
    a. Finish: Clear anodized.
4. Sill: Manufacturer's standard type.
5. Counter Top Material: 18 gauge, stainless steel, #4 satin finish.

C. Glazing (BR-1): Bullet Resistant Level 3 (minimum), Glass-Clad Polycarbonate Glazing, clear.

D. Voice Baffle: Horizontal baffle. Manufacturer's standard glazing baffle system with Bullet Resistant Level 3 (minimum).

E. Deal Tray: Integral with window sill. Bullet Resistant Level 3 (minimum).
1. Material: One piece stainless steel tray construction, 18 gauge, 0.0500 inch minimum thickness.

2.05 BULLET RESISTANT ALUMINUM EXTERIOR (AND INTERIOR) ENTRANCE DOORS AND WINDOWS

A. Security Storefront Windows and Doors: Exterior window and entrance systems designed to provide bullet resistance.

B. Bullet Resistant Doors and Windows:
1. Door and Frame Performance:
    a. Standard door and frame assembly shall be manufactured to defeat ballistic assaults from a .44 magnum superpower small arms handgun, in accordance with UL Standard 752, Level 3.
    b. Door assembly stiles, top rails and bottom rails shall be lined with hardened steel to meet Level 3 UL standards.
    c. Finish: Clear anodized.
2. Aluminum Doors:
    a. Top rail and stile: 2-3/4 inch.
    b. Bottom rail, including glass stops: 10 inch.
    c. Aluminum Door and Sidelight Frames and Extrusions: 1-3/4 inch with structural section 0.125 inch thick.
    d. Glazing: LP-1250 Polycarbonate/Acrylic Laminate, 1-1/4 inch thick, 7.7lbs/sf to comply with UL 752, Level 3 protection.
        1) Tint: Match existing building.
3. Bullet Resistant Windows:
    a. One and two piece U-channel aluminum framing system.
    b. Protection rating shall be UL Standard 752 Level 3.
    c. Door and frame shall have no exposed fasteners.
    d. Corner joints shall consist of extruded and keyed aluminum spline with continuous 3/8 inch diameter steel tie rod at door top and bottom rails.
    e. Glazing (IGU-BR): (Exterior applications) LP-1250 Polycarbonate/Acrylic Laminate, 1-1/4 inch thick, 7.7lbs/sf to comply with UL 752, Level 3 protection.
        1) Tint: Match existing building.
    f. Glazing (BR-1): (Interior applications) Bullet Resistant Level 3 (minimum), Glass-Clad Polycarbonate Glazing, clear.

2.06 ASSEMBLY COMPONENTS

A. Frame Anchors: Mild steel plates, shapes, or bars, concealed in completed construction; provide anchorage devices as necessary to securely fasten windows to adjacent construction; use security fasteners for exposed anchors.
1. For Embedding in Concrete: Minimum 3/16 inch thick plates, with minimum of two 1/2 inch diameter headed stud welded to back; designed for later welding to window frame.

2. For Setting in Masonry: Minimum 3/16 inch thick angles or plates, minimum 4 inches long with hooked ends, welded to back of window frame.
3. Provide minimum of two anchors per side of window plus one additional anchor for each 18 inches or fraction thereof more than 36 inches in height or width.

B. Glazing Seals: Factory installed; molded EPDM or neoprene compressible gaskets and compression strips.

C. Isolation Coatings: Cold applied non-conductive coating applied to prevent contact of dissimilar metals.

2.07 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that window openings are ready for installation of windows.

B. Verify that correct embedded anchors are in place and in proper location; repair or replace anchors as required to achieve satisfactory installation.

C. Notify Design Professional if conditions are not suitable for installation of windows; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and drawing details.

B. Install windows in correct orientation (inside/outside or secure/non-secure).

C. Anchor windows securely in manner so as to achieve performance specified.

D. Separate metal members from concrete and masonry using bituminous paint.

E. Set sill members and sill flashing in continuous bead of sealant.

3.03 ADJUSTING

A. Adjust operating components for smooth operation while also providing tight fit at contact points and a secure enclosure; lubricate operating hardware.

3.04 CLEANING

A. Clean exposed surfaces promptly after installation without damaging finishes.

B. Remove and replace defective work.

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SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 01 Section "General Conditions”.
2. Division 06 Section “Rough Carpentry”.
3. Division 06 Section “Finish Carpentry”.
4. Division 08 Section “Operations and Maintenance”.
5. Division 08 Section “Hollow Metal Doors and Frames”.
6. Division 08 Section “Flush Wood Doors”.
7. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
8. Division 08 Section “Automatic Door Operators”.
9. Division 26 Section "Electrical”

D. Codes and References: Comply with the version adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.
    c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

   1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
   2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

   1. Function of building, purpose of each area and degree of security required.
   2. Plans for existing and future key system expansion.
   3. Requirements for key control storage and software.
   4. Installation of permanent keys, cylinder cores and software.
   5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

   1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
   2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
   3. Review sequence of operation narratives for each unique access controlled opening.
   4. Review and finalize construction schedule and verify availability of materials.
   5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Hardware shall not have any visible manufacturer names on exposed materials, except cylinders, when the door is in a closed position.

2.2 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

    a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
    b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

    a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
    b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

    a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

5. Manufacturers:

    a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.3 CONTINUOUS HINGES

A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

    a. Pemko (PE).

2.4 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. Pemko (PE) - EL-CEPT Series.
    b. Securitron (SU) - EL-CEPT Series.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

    a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:

    a. Rockwood (RO).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
6. Manufacturers:

    a. Rockwood (RO).

2.6 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. New System: Key locks to a new key system as directed by the Owner.

D. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).

3. Construction Keys (where required): Ten (10).

E. Construction Keying: Provide construction master keyed cylinders.

F. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.7 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.8 MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - ML2000 Series.
b. Sargent Manufacturing (SA) - 8200 Series.

2.9 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide exit devices with functions and features as follows:
    a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
    b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
    c. No catch points: addition of applied deflectors or other added components are not allowed.
    d. No visible plastic.
    e. Heavy duty end caps with flush and overlapping options made of stainless steel, brass, or bronze with architectural finishes.
    f. Constructed of all stainless steel.
    g. Stainless steel pullman type latch with deadlock feature.
    h. Narrow or wide style exterior trim as specified in the hardware sets.
    i. Center case adjustability on concealed vertical rod exit devices; single operation with hex key individually adjusts top or bottom latches. No retainer screws or clips required to maintain adjustment.
    j. Ten-year limited warranty for mechanical features.
2. Electromechanical exit devices shall have the following functions and features:
    a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
    b. Wire routing for all non-access control electromechanical functions and EcoFlex trim to be contained within the carrier of the device eliminating the need for cavities in doors to be drilled. Include a protective film so that wires don't get damaged if the rail needs to be removed.

c. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
d. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
e. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.

3. Manufacturers:

a. Corbin Russwin Hardware (RU) - PED4000 / PED5000 Series.
b. Sargent Manufacturing (SA) - PE80 Series.

2.11 SURFACE DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Large body cast iron surface mounted door closers shall have a 30-year warranty.
2. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC8000 Series.
b. Norton Rixson (NO) - 9500 Series.
c. Sargent Manufacturing (SA) - 281 Series.

2.12 ELECTROMECHANICAL DOOR OPERATORS

A. Electromechanical Door Operators (Moderate Traffic): Provide ANSI/BHMA A156.19 Certified Products Directory (CPD) listed low energy operators that are UL325/991 certified and comply with requirements for the Americans with Disabilities Act (ADA). Operators shall accommodate openings up to 200 pounds and 48” wide. Provide accessories such as custom templates, special mounting brackets, spacers and drop plates as needed for proper installation. Operators shall accommodate openings up to 200 pounds and 48” wide. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide operators with features as follows:

a. Non-handed with push and pull side mounting.
b. Activation by wall switch, hands-free or radio frequency devices.
c. Adjustable opening force and closing power.
d. Two-year limited warranty.

e. Wi-Fi interface where the operator is a secure, password protected WiFi hot spot with no connection to building's IT required.

1) Simple setup with no app required.
2) View status and make adjustments without removing the cover.
3) Built-in logic to support single use restroom applications with no external relay boards, logic modules, position switches required.

f. Mounting backplate to simplify and speed up installation.

2. Operators shall have the following functionality:

a. Adjustable Hold Open: Amount of time a door will stay in the full open position after an activation.
b. Infinite Hold Open: Door will hold open at set position until power is turned off.
c. Latch Assist: At closed position, after an activation, the door is pulled in. After the door has closed, the door is pulled in to assist with latch release/engagement.
d. Obstruction Detection: Door closes if it hits an obstruction while opening; door will reverse to open position if it hits an obstruction while closing. Door will stop once it hits an obstruction and will rest against the obstruction until removed.
e. Open Delay: Delays operator opening for locking hardware.
f. Outside Wall Switch Disable: When contact is closed, outside wall switch is disabled.
g. Power Close: Additional force to assist door closing between 7° and 2°.
h. Presence Detector Input: Input for external sensor to detect presence at door open or close position only.
i. Selector Mode Switch: Off disables the signal inputs unless Blow Open is activated, on activates the signal inputs, hold open activates the unit (unless Blow Closed is activated) to the hold open position.
j. Restroom Function: Built-in, configurable operator logic to support single use restroom applications without the need for external relays, logic modules, or door position switches.
k. Executive Mode Feature: When the door receives an activation signal it opens and remains open until either a second signal is received, or the door is manually moved in closing direction.

3. Manufacturers:

a. Norton Rixson (NO) - 5200 Series.

2.13 ELECTROHYDRAULIC DOOR OPERATORS

A. Electrohydraulic Door Operators (High Traffic): Provide ANSI/BHMA A156.19 Certified Products Directory (CPD) listed low energy operators that meet ANSI/BHMA A156.4 requirements and are UL listed for use on fire rated doors and UL10C certified that comply with requirements for the Americans with Disabilities Act (ADA). Operators shall be verified by GreenCircle to offer energy savings of 19% when compared to similar products to accommodate openings up 250 pounds and 48" wide. Provide accessories such as custom templates, special mounting brackets, spacers and drop plates as needed for proper installation. Operators shall accommodate openings up to 200 pounds and 48" wide. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide operators with features as follows:

a. Non-handed with push and pull side mounting.
b. Operates as mechanical surface closer during close cycles, when door is opened manually or if power is off.
c. Activation by push button, hands-free or radio frequency devices.
d. On board electronics to collect usage and cycle count data to facilitate preventative maintenance/diagnostics.
e. Two-year limited warranty.

f. Wi-Fi interface where the operator is a secure, password protected WiFi hot spot with no connection to building's IT required.

1) Simple setup with no app required.
2) View status and make adjustments without removing the cover.
3) Built-in logic to support single use restroom applications with no external relay boards, logic modules, position switches required.

g. Mounting backplate to simplify and speed up installation.

2. Operators shall have the following functionality:

a. Adjustable Hold Open: Amount of time a door will stay in the full open position after an activation.
b. Blow Open for Smoke Ventilation: Door opens when signal is received from alarm system allowing air or smoke to flow through opening. Door will stay open until signal from alarm system is stopped.
c. Infinite Hold Open: Door will hold open at set position until power is turned off.
d. Obstruction Detection: Door closes if it hits an obstruction while opening; door will reverse to open position if it hits an obstruction while closing. Door will stop once it hits an obstruction and will rest against the obstruction until removed.
e. Open Delay: Delays operator opening for locking hardware.
f. Overload Safety Shut-Off: After two minutes of receiving a door activation signal, inverter times out and door closes to prevent motor/inverter damage.
g. Presence Detector Input: Input for external sensor to detect presence at door open or close position only.
h. Push & Go: As the door is manually opened, the operator "senses" movement and opens door to the full-open position.
i. Selector Mode Switch: Off disables the signal inputs unless Blow Open is activated, on activates the signal inputs, hold open activates the unit (unless Blow Closed is activated) to the hold open position.
j. Vestibule Delay: When the wall switch is pressed, first door in vestibule will open. Second door will open once vestibule door delay has expired. Delay is adjustable.

3. Manufacturers:

a. Norton Rixson (NO) - 6000 Series.

2.14 ARCHITECTURAL TRIM AND ACCESSORIES

A. Door, Frame and Wall Protective Trim: ANSI/BHMA A156.6, protective products as specified in the hardware sets. Door protection plates shall be not more than 2" less than door width on stop side and 1" less door width on the pull side or on stop side of pairs of doors. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide protective trim with functions and features as follows:

a. Meets ADA requirements for smooth bottom door surfaces.
b. UL Classified options for use on fire-rated doors up to 3 hours.
c. Fabricated from stainless steel, brass, bronze, aluminum, or high-impact plastic.
d. Available in a variety of sizes, finishes, and profiles to suit aesthetic and functional requirements.
e. Designed to protect doors, frames, and adjacent walls from damage due to impact, abrasion, or traffic.
f. Fasteners included; adhesive-backed options available for select models.
g. Ten-year limited warranty.

2. Manufacturers:

a. Rockwood (RO).

2.15 DOOR STOPS AND HOLDERS

A. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Rockwood (RO).

B. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Norton Rixson (NO).
    b. Rockwood (RO).
    c. Sargent Manufacturing (SA).

2.16 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.17 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

    a. Alarm Controls (AK) - CP1-1026 Series.
    b. Securitron (SU) - DPS Series.

B. Intelligent Switching Power Supplies: Provide the least number of power supplies at the appropriate amperage level sufficient to exceed the required total draw for the specified electrified hardware and access control equipment. Coordinate quantity of power supplies required.

1. Power supplies shall meet all functions and features as specified herein.

a. UL listed dual voltage 12 or 24 VDC field selectable continuous output.
b. Dedicated fast charger to prolong battery life with low battery cutoff to protect batteries from deep discharge.
c. Enhanced surge immunity for input/output protection
d. Separate, dedicated battery charging circuit to keep locks cooler.
e. Dual-color LED visual notification to prevent applying incorrect voltages to the power supply.
f. Instant auto-switch to battery on AC loss.
g. Expandable up to 16 outputs in the standard enclosure
h. Integrated fire alarm interface to allow main output shutdown or disconnect on a per output basis when using an R8 output module.
i. Network ready and remotely manage locks and connected devices when using an M8 managed output module on network models.
j. Lifetime replacement, no-fault, no questions asked warranty.

2. Manufacturers:

a. Securitron (SU) - AQL Series.

2.18 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.19 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Paint prime coated mullions to match frames.

C. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

E. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

F. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

G. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SU - Securitron
4. SA - SARGENT
5. RO - Rockwood
6. NO - Norton Rixson
7. HD - HID
8. OT - Other

Hardware Sets

Set: 1.0
Doors: 1000X, 1002, 1305X
Description: CVR x NL/EO x ELR, AOx1, Pair no Mullion, Ext, Alum

2	Continuous Hinge x EPT (AL)	CFM SLF-HD1 PT x Dr Ht		PE	
2	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	CVR Exit (NL, ELR, RX, narrow)	55 56 ADPE8410 x P106	US32D	SA	⚡
1	CVR Exit (exit only, ELR, RX, narrow)	55 56 ADPE8410 EO	US32D	SA	⚡
2	Offset Pull (Grip Zone)	RM3411-72 x 1XHD MP	US32	RO	
2	Conc Overhead Stop	1-X36	630	NO	
1	Closer - Top Jamb	281 OZ	EN	SA	
1	Automatic Operator	6011 / 6061 (as req'd)	689	NO	⚡
2	Brush Sweep	18061CNB		PE	
1	Threshold - 5" T-Break	252x3AFG		PE	
2	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
2	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
2	Actuator Button	505		NO	⚡
2	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes: WIDE STILE EXIT DEVICES ACCEPTABLE WHERE THEY WILL FIT
-Weatherstripping/Door edge gasketing furnished by Aluminum Door/Frame supplier.
-Furnish all necessary brackets/spacers and plates necessary for a complete and proper installation of hardware items listed.

Doors normally closed and locked.
Valid card read retracts latch on active leaf for entry. Key override available.
Doors can be unlocked on a time schedule set in EAC system, to act as push/pull.
When doors are unlocked, either actuator button opens active leaf automatically.
When doors are locked, inside actuator button retracts latch of active leaf and opens door automatically.
Door position switch indicates door status.
REX switch in push bar signals authorized egress.
Free egress at all times.

Set: 2.0
Doors: 2004AX, 2004BX, 3004X
Description: Card Reader x Rim Exit x ELR x Pull, Closer x Stop, Ext, HM

3	Hinge (heavy weight)	T4A3386 (NRP)	US32D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (NL, ELR, RX)	55 56 PE8804 Less Pull	US32D	SA	⚡
1	Closer x HD Stop	281 CPS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Rain Guard	346C (frame width)		PE	
1	Gasketing	2891AS (head/jambs)		PE	
1	Brush Sweep	18061CNB		PE	
1	Threshold - 6" T-Break	253x3AFG		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read retracts latch for entry.
Key override available.
DPS indicates door status.
REX in exit device push bar signals valid egress.
Free egress at all times.

Set: 3.0
Doors: 1004X
Description: Card Reader x Rim Exit x ELR x Pull, Auto Operator, Ext, HM

3	Hinge (heavy weight)	T4A3386 (NRP)	US32D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (NL, ELR, RX)	55 56 PE8804 Less Pull	US32D	SA	⚡
1	Automatic Operator	6011 / 6061 (as req'd)	689	NO	⚡
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Rain Guard	346C (frame width)		PE	
1	Gasketing	2891AS (head/jambs)		PE	
1	Brush Sweep	18061CNB		PE	
1	Threshold - 6" T-Break	253x3AFG		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
2	Actuator Button	505		NO	⚡
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read retracts latch for entry.
Key override available.
When latch is retracted, outside actuator opens door automatically.
Inside actuator retracts latch then opens door automatically.
DPS indicates door status.
REX in exit device push bar signals valid egress.
Free egress at all times.

Set: 4.0
Doors: 1007X
Description: Card Reader x Fail Secure Lever x Rim Exit, Closer x Stop, Ext, HM

3	Hinge (heavy weight)	T4A3386 (NRP)	US32D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX)	55 PE8876 NEL	US32D	SA	⚡
1	Closer x HD Stop	281 CPS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Rain Guard	346C (frame width)		PE	
1	Gasketing	2891AS (head/jambs)		PE	
1	Brush Sweep	18061CNB		PE	
1	Threshold - 6" T-Break	253x3AFG		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read retracts latch for entry.
Key override available.
DPS indicates door status.
REX in exit device push bar signals valid egress.
Free egress at all times.

Set: 5.0
Doors: 1203X
Description: Storeroom Lever, Rim Exit, Exterior

3	Hinge (heavy weight)	T4A3386 (NRP)	US32D	MK	
1	Rim Exit (storeroom lvr)	PE8804 NEL	US32D	SA	
1	Closer x HD Stop	281 CPS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Rain Guard	346C (frame width)		PE	
1	Gasketing	2891AS (head/jambs)		PE	
1	Brush Sweep	18061CNB		PE	
1	Threshold - 6" T-Break	253x3AFG		PE	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡

Notes: Install gasketing at head before installing closer(s).
Install gasketing at jambs before installing rim device strike.

DPS indicates door status.

Set: 6.0
Doors: 1005X
Description: Storeroom, Closer/Stop, Exterior, HM

3	Hinge (heavy weight)	T4A3386 (NRP)	US32D	MK
1	Storeroom Lock	8204 LNL	US26D	SA
1	Closer x HD Stop	281 CPS	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Gasketing	2891AS (head)		PE
2	Gasketing	290AS (jambs)		PE
1	Rain Guard	346C (frame width)		PE
1	Brush Sweep	18061CNB		PE
1	Threshold - 6" T-Break	253x3AFG		PE

Notes: Install gasketing at head before installing closer(s).

Set: 7.0
Doors: 1001A
Description: CVR x NL/EO x ELR, AOx1, Pair no Mullion, Int, Alum

2	Continuous Hinge x EPT (AL)	CFM SLF-HD1 PT x Dr Ht		PE	
2	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	CVR Exit (NL, ELR, RX, narrow)	55 56 ADPE8410 x P106	US32D	SA	ϟ
1	CVR Exit (exit only, ELR, RX, narrow)	55 56 ADPE8410 EO	US32D	SA	ϟ
2	Offset Pull (Grip Zone)	RM3411-72 x 1XHD MP	US32	RO	
2	Conc Overhead Stop	2-X36	630	NO	
1	Closer - Top Jamb	281 OZ	EN	SA	
1	Automatic Operator	6011 / 6061 (as req'd)	689	NO	ϟ
2	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
2	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
2	Actuator Button	505		NO	ϟ
2	Door Position Switch	DPS-M / W-GY (as req'd)		SU	ϟ
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes: WIDE STILE EXIT DEVICES ACCEPTABLE WHERE THEY WILL FIT
-Furnish all necessary brackets/spacers and plates necessary for a complete and proper installation of hardware items listed.

Doors normally closed and locked.
Valid card read retracts latch on active leaf for entry. Key override available.
Doors can be unlocked on a time schedule set in EAC system, to act as push/pull.
When doors are unlocked, either actuator button opens active leaf automatically.
When doors are locked, inside actuator button retracts latch of active leaf and opens door automatically.
Door position switch indicates door status.
REX switch in push bar signals authorized egress.
Free egress at all times.

Set: 8.0
Doors: 3601
Description: Rim x NL x CR x ELR, Closer/Stop/HO, Sgl, Int, Alum

1	Continuous Hinge x EPT (AL)	CFM SLF-HD1 PT x Dr Ht		PE	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (NL, ELR, RX, narrow)	55 56 PE8504 Less Pull	US32D	SA	⚡
1	Offset Pull (Grip Zone)	RM3411-36 x 1XHD	US32	RO	
1	Closer x Stop/HO	281 PSH	EN	SA	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes: WIDE STILE EXIT DEVICES ACCEPTABLE WHERE THEY WILL FIT
-Furnish all necessary brackets/spacers and plates necessary for a complete and proper installation of hardware items listed.

Door normally closed and locked.
Valid card read retracts latch for entry. Key override available.
Door can be unlocked on a time schedule set in EAC system, to act as push/pull.
Door position switch indicates door status.
REX switch in push bar signals authorized egress.
Free egress at all times.

Set: 9.0
Doors: 1004
Description: Card Reader x Electric Strike, Rim Exit x Pull, Auto Operator, Rated, Int

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (NL, ELR, RX, rated)	12 55 56 PE8804 Less Pull	US32D	SA	⚡
1	Offset Pull (Grip Zone)	RM3411-36 x 1XHD	US32	RO	
1	Automatic Operator	6011 / 6061 (as req'd)	689	NO	⚡
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	Perimeter Gasketing	S88BL (head & jambs)		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
2	Actuator Button	505		NO	⚡
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read retracts latch for entry.
Key override available.
When latch is retracted, stair side actuator button opens door automatically.
Inside actuator button retracts latch then opens door automatically.
DPS indicates door status.
REX in exit device push bar signals valid egress.
Free egress at all times.

Set: 10.0
Doors: 2004, 3004, 3007
Description: Card Reader x Rim Exit x Fail Safe Lever, Rated, Stair

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail safe elec lvr, rated, RX)	12 55 PE8875 NEL	US32D	SA	⚡
1	Closer - Reg Arm	281 O10	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	Perimeter Gasketing	S88BL (head & jambs)		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked with power.
Valid card read from stair side unlocks lever for access to floor.
Key override available.
Lever unlocks on signal from fire command center or loss of power to the device.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 11.0
Doors: 2002, 3006
Description: Card Reader x Rim Exit x Fail Secure Lever, Closer

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX)	55 PE8876 NEL	US32D	SA	⚡
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks lever for entry.
Key override available.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 12.0
Doors: 2200
Description: Card Reader x Rim Exit x Fail Secure Lever, Closer, Remote Release

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX)	55 PE8876 NEL	US32D	SA	⚡
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Intercom/Remote Release	By Security Contractor		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read or remote release unlocks lever for entry.
Key override available.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 13.0
Doors: 3200
Description: Card Reader x Rim Exit x Fail Secure Lever, Closer/Stop

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX)	55 PE8876 NEL	US32D	SA	⚡
1	Closer x Stop	281 PS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks lever for entry.
Key override available.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 14.0
Doors: 2200A
Description: Card Reader x Rim Exit x Fail Secure Lever, Closer/Stop, Remote Release

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX)	55 PE8876 NEL	US32D	SA	⚡
1	Closer x Stop	281 PS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Intercom/Remote Release	By Security Contractor		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read or remote release unlocks lever for entry.
Key override available.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 15.0
Doors: 1007, 2007A
Description: Card Reader x Rim Exit x Fail Secure Lever, Closer, Rated

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX, rated)	12 55 PE8876 NEL	US32D	SA	⚡
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	Perimeter Gasketing	S88BL (head & jambs)		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks lever for entry.
Key override available.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 16.0
Doors: 2007B
Description: Card Reader x Rim Exit x Fail Secure Lever, Closer, Surf OH Stop, Rated

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Rim Exit (fail sec elec lvr, RX, rated)	12 55 PE8876 NEL	US32D	SA	⚡
1	Surf Overhead Stop	10-X36	630	NO	
1	Closer - Reg Arm	281 O10	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Perimeter Gasketing	S88BL (head & jambs)		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Wiring Diagram	Elevation & Point to Point		OT	
1	Door Position Switch	DPS-M / W-GY (as req'd)		SU	⚡
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks lever for entry.
Key override available.
DPS indicates door status.
Request to exit in exit device push bar signals valid egress.
Free egress to stair at all times.

Set: 17.0
Doors: 1205, 1206
Description: Storeroom Lever x Rim Exit, Closer, Fire Rated

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Rim Exit (storeroom lvr, rated)	12 PE8804 NEL	US32D	SA
1	Closer - PA	281 P10	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Stop	406 / 409 / 441	US26D	RO
1	Perimeter Gasketing	S88BL (head & jambs)		PE

Set: 18.0
Doors: 1100
Description: Card Reader x Electrified Lock, No Closer

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Fail Secure Lock	8271 LNL	US26D	SA	⚡
1	Stop	406 / 409 / 441	US26D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 19.0
Doors: 1312, 1322, 1326, 1327, 1328, 2003, 2008A, 3300, 3308, 3604
Description: Card Reader x Electrified Lock, Closer

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	Fail Secure Lock	8271 LNL	US26D	SA	ϟ
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 20.0
Doors: 1003, 3005
Description: Card Reader x Electrified Lock, Closer, Wet Area

3	Hinge (heavy weight)	T4A3386 (NRP)	US32D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	Fail Secure Lock	8271 LNL	US26D	SA	ϟ
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 21.0
Doors: 1200, 3100, 3400A
Description: Card Reader x Electrified Lock, Closer, Remote Release

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	Fail Secure Lock	8271 LNL	US26D	SA	ϟ
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Intercom/Remote Release	By Security Contractor		OT	
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes:
Door normally closed and locked.
Valid card read or remote release unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 22.0
Doors: 3600A
Description: Card Reader x Electrified Lock, Closer, Sound Seals

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	Fail Secure Lock	8271 LNL	US26D	SA	ϟ
1	Closer	281 UO	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
1	Acoustic Seal Set	PEMKOSTCSET-1A	BL	PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 23.0
Doors: 3208B, 3603
Description: Card Reader x Electrified Lock, Closer/Stop

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Fail Secure Lock	8271 LNL	US26D	SA	⚡
1	Closer x Stop	281 PS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 24.0
Doors: 3400B
Description: Card Reader x Electrified Lock, Closer/Stop, Remote Release

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Fail Secure Lock	8271 LNL	US26D	SA	⚡
1	Closer x Stop	281 PS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Intercom/Remote Release	By Security Contractor		OT	
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read or remote release unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 25.0
Doors: 3101
Description: Card Reader x Electrified Lock, Closer, Surf OH Stop

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Fail Secure Lock	8271 LNL	US26D	SA	⚡
1	Surf Overhead Stop	10-X36	630	NO	
1	Closer - Reg Arm	281 O10	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 26.0
Doors: 3600B
Description: Card Reader x Electrified Lock, Closer, Surf OH Stop, Sound Seals

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Fail Secure Lock	8271 LNL	US26D	SA	⚡
1	Surf Overhead Stop	10-X36	630	NO	
1	Closer - Reg Arm	281 O	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Acoustic Seal Set	PEMKOSTCSET-1A	BL	PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 27.0
Doors: 1300, 2107, 3302
Description: Card Reader x Electrified Lock, Closer, Conc OH Stop

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	Fail Secure Lock	8271 LNL	US26D	SA	ϟ
1	Conc Overhead Stop	2-X36	630	NO	
1	Closer - Reg Arm	281 O10	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 28.0
Doors: 1001B
Description: Card Reader x Electrified Lock, Closer/Stop, Rated

3	Hinge (heavy weight)	T4A3786-MCK (NRP)	US26D	MK	
1	Electric Power Transfer	EL-CEPT	630	SU	ϟ
1	Fail Secure Lock	8271 LNL	US26D	SA	ϟ
1	Closer x Stop	281 PS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Perimeter Gasketing	S88BL (head & jambs)		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	ϟ
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	ϟ
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	ϟ

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 29.0
Doors: 2221
Description: Card Reader x Electrified Lock, Closer/Stop, Continuous Hinge, Rated

1	Continuous Hinge x EPT (WD/HM)	CFM HD1 PT x Dr Ht		PE	
1	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	Fail Secure Lock	8271 LNL	US26D	SA	⚡
1	Closer x Stop	281 PS	EN	SA	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Perimeter Gasketing	S88BL (head & jambs)		PE	
1	E-Lynx Harness (Frame)	QC-C3000P		MK	⚡
1	E-Lynx Harness (Door)	QC-C*** (length / type as req'd)		MK	⚡
1	Card Reader	By Security Contractor	BLK	HD	
1	Power Supply	AQL-E1 Series		SU	⚡

Notes:
Door normally closed and locked.
Valid card read unlocks outside lever for entry.
Key override available.
Free egress at all times.

Set: 30.0
Doors: 1304B, 3209
Description: Storeroom

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Storeroom Lock	8204 LNL	US26D	SA
1	Stop	406 / 409 / 441	US26D	RO

Set: 31.0
Doors: 1006, 2219
Description: Storeroom, Closer/Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Storeroom Lock	8204 LNL	US26D	SA
1	Closer x Stop	281 PS	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO

Set: 32.0
Doors: 1201, 1202, 1203, 1204, 1207, 1208, 1314, 1323, 1324, 1329, 2103, 2104, 2105, 2106, 2108, 2110, 2114, 2201, 2204, 2206, 2207, 2210, 2211, 2212, 2213, 2214, 3104, 3106, 3107, 3108, 3109, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3210, 3211, 3212, 3304, 3305, 3401, 3402, 3403, 3404
Description: Office

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Office Lock	8205 LNL	US26D	SA
1	Stop	406 / 409 / 441	US26D	RO

Set: 33.0
Doors: 2202, 3301B
Description: Office, Surface OH Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Office Lock	8205 LNL	US26D	SA
1	Surf Overhead Stop	10-X36	630	NO

Set: 34.0
Doors: 1325, 3301A
Description: Office, Conc OH Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Office Lock	8205 LNL	US26D	SA
1	Conc Overhead Stop	2-X36	630	NO

Set: 35.0
Doors: 1309.2
Description: Office, Closer

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Office Lock	8205 LNL	US26D	SA
1	Closer	281 UO	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Stop	406 / 409 / 441	US26D	RO

Set: 36.0
Doors: 1309.1
Description: Office, Closer/Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Office Lock	8205 LNL	US26D	SA
1	Closer x Stop	281 PS	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO

Set: 37.0
Doors: 1315, 3307
Description: Office, Closer, Conc OH Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Office Lock	8205 LNL	US26D	SA
1	Conc Overhead Stop	2-X36	630	NO
1	Closer - Reg Arm	281 O10	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO

Set: 38.0
Doors: 1310, 1311, 1317, 1318, 1319, 1320, 3102, 3103
Description: Classroom

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Classroom Lock	8237 LNL	US26D	SA
1	Stop	406 / 409 / 441	US26D	RO

Set: 39.0
Doors: 2220
Description: Classroom, Closer/Stop, Cont Hinge, Rated

1	Continuous Hinge (WD/HM)	CFM HD1-M x Dr Ht		PE
1	Classroom Lock	8237 LNL	US26D	SA
1	Closer x Stop	281 PS	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Perimeter Gasketing	S88BL (head & jambs)		PE

Set: 40.0
Doors: 2218
Description: Classroom, Closer, Conc OH Stop, Cont Hinge, Rated

1	Continuous Hinge (WD/HM)	CFM HD1-M x Dr Ht		PE
1	Classroom Lock	8237 LNL	US26D	SA
1	Conc Overhead Stop	2-X36	630	NO
1	Closer - Reg Arm	281 O10	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Perimeter Gasketing	S88BL (head & jambs)		PE

Set: 41.0
Doors: 3309, 3310
Description: Privacy Restroom

3	Hinge	TA2314 (NRP)	US32D	MK
1	Privacy Set (OCC/VAC)	V21 8265 LNL	US26D	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 4" 4BE CSK	US32D	RO
1	Stop	406 / 409 / 441	US26D	RO

Set: 42.0
Doors: 3311
Description: Privacy, Sound Seals

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Privacy Set (OCC/VAC)	V21 8265 LNL	US26D	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Stop	406 / 409 / 441	US26D	RO
1	Acoustic Seal Set	PEMKOSTCSET-1A	BL	PE

Set: 43.0
Doors: 1209, 2111, 2112
Description: Privacy Restroom Closer

3	Hinge	TA2314 (NRP)	US32D	MK
1	Privacy Set (OCC/VAC)	V21 8265 LNL	US26D	SA
1	Closer	281 UO	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 4" 4BE CSK	US32D	RO
1	Stop	406 / 409 / 441	US26D	RO

Set: 44.0
Doors: 2001, 2113, 2208, 3208A, 3306
Description: Passage

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Passage Set	8215 LNL	US26D	SA
1	Stop	406 / 409 / 441	US26D	RO

Set: 45.0
Doors: 2203, 2205, 3105
Description: Passage, Surf OH Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Passage Set	8215 LNL	US26D	SA
1	Surf Overhead Stop	10-X36	630	NO

Set: 46.0
Doors: 1313.1, 2101, 2215, 2217
Description: Passage, Closer

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Passage Set	8215 LNL	US26D	SA
1	Closer	281 UO	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Stop	406 / 409 / 441	US26D	RO

Set: 47.0
Doors: 1313.2, 2102A, 2102B, 2222B
Description: Passage x Closer/Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Passage Set	8215 LNL	US26D	SA
1	Closer x Stop	281 PS	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO

Set: 48.0
Doors: 2222A
Description: Passage, Closer, Conc OH Stop

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Passage Set	8215 LNL	US26D	SA
1	Conc Overhead Stop	2-X36	630	NO
1	Closer - Reg Arm	281 O10	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO

Set: 49.0
Doors: 3602A, 3602C
Description: Pull, Roller Latch, Surf OH Stop, Pair

6	Hinge	TA2714-MCK (NRP)	US26D	MK
2	Roller Latch	594	US26D	RO
2	Straight Pull	RM301	US32D	RO
1	Surf Overhead Stop	10-X36	630	NO

Set: 50.0
Doors: 3602D
Description: Pull, Roller Latch, Surf OH Stop, Sgl

3	Hinge	TA2714-MCK (NRP)	US26D	MK
1	Roller Latch	594	US26D	RO
1	Straight Pull	RM301	US32D	RO
1	Surf Overhead Stop	10-X36	630	NO

Set: 51.0
Doors: 1301, 1302, 2005, 2006, 3002
Description: Push/Pull Restroom

3	Hinge	TA2314 (NRP)	US32D	MK
1	Pull x Plate	126x70C	US32D	RO
1	Push Plate	70E	US32D	RO
1	Closer	281 UO	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 4" 4BE CSK	US32D	RO
1	Door Stop & Keeper	477	US26D	RO

Set: 52.0
Doors: 1303
Description: Push/Pull Restroom, Closer/Stop

3	Hinge	TA2314 (NRP)	US32D	MK
1	Pull x Plate	126x70C	US32D	RO
1	Push Plate	70E	US32D	RO
1	Closer x Stop	281 PS	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 4" 4BE CSK	US32D	RO

Set: 53.0
Doors: 3003
Description: Push/Pull Restroom, Closer, Surf OH Stop

3	Hinge	TA2314 (NRP)	US32D	MK
1	Pull x Plate	126x70C	US32D	RO
1	Push Plate	70E	US32D	RO
1	Surf Overhead Stop	10-X36	630	NO
1	Closer - Reg Arm	281 O10	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 4" 4BE CSK	US32D	RO

Set: 54.0
Doors: 1304A
Description: Push/Pull Restroom, Closer, Conc OH Stop

3	Hinge	TA2314 (NRP)	US32D	MK
1	Pull x Plate	126x70C	US32D	RO
1	Push Plate	70E	US32D	RO
1	Conc Overhead Stop	2-X36	630	NO
1	Closer - Reg Arm	281 O10	EN	SA
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO
1	Mop Plate	K1050 4" 4BE CSK	US32D	RO

Set: 55.0
Doors: 1305
Description: Push/Pull, Auto Operator

3	Hinge	TA2714-MCK (NRP)	US26D	MK	
1	Pull x Plate	126x70C	US32D	RO	
1	Push Plate	70E	US32D	RO	
1	Automatic Operator	5211 / 5231	689	NO	
1	Kick Plate	K1050 10" 4BE CSK	US32D	RO	
1	Stop	406 / 409 / 441	US26D	RO	
2	Actuator Button	505		NO	

Notes:
Either actuator button opens door automatically.

Set: 56.0
Doors: 1307, 1308
Description: All Hardware By Door Mfr.

1	All Hardware	By Door Manufacturer		OT

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SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Plastic films.

D. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 08 56 53 - Interior and Exterior Security Assemblies.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2026.

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).

D. ASTM C1036 - Standard Specification for Flat Glass; 2025.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

G. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

H. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

I. GANA (GM) - GANA Glazing Manual; 2022.

J. GANA (SM) - GANA Sealant Manual; 2008.

K. ITS (DIR) - Directory of Listed Products; Current Edition.

L. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. Product Data on specified Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

B. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

C. Samples: Submit insulated glazing unit samples for design professional selection of match to existing window tint.

D. Samples: Submit samples for selection of plastic film

E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) for glazing installation methods.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years experience.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

C. Store products in manufacturer's unopened packaging until ready for installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
1. GGI - General Glass International: www.generalglass.com.
2. Tecnoglass: www.tecnoglass.com/#sle.
3. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
4. Oldcastle BuildingEnvelope; www.obe.com
5. Viracon, Inc: www.viracon.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Float Glass Manufacturers:
1. AGC Glass North America, Inc: www.agc-yourglass.com.
2. Cardinal Glass Industries: www.cardinalcorp.com.
3. Guardian Glass, LLC: www.guardianglass.com.
4. Oldcastle BuildingEnvelope; www.obe.com
5. Pilkington North America Inc: www.pilkington.com/na.
6. Saint Gobain North America: www.saint-gobain.com/#sle.
7. PPG Industries, Inc: www.ppgideascapes.com.
8. Substitutions: See Section 01 60 00 - Product Requirements.
9. Vitro Architectural Glass (formerly PPG Glass); www.vitroglazings.com

C. Plastic Films Manufacturers:
1. 3M Window Film: www.3m.com.
2. Flexvue Films: www.flexvuefilms.com/#sle.
3. Llumar, an Eastman Chemical Company: www.llumar.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
3. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.

2.03 INSULATING GLASS UNITS

A. Exterior Insulating Glass Manufacturers:
1. Glass: Any of the manufacturers specified for float glass.
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Exterior Insulating Glass Units, General:
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   3. Warm-Edge Spacers: Low conductivity thermoplastic and stainless steel.
      a. Spacer Width: As required for specified insulating glass unit.
      b. Spacer Height: Manufacturer's standard.
      c. Products:
         1) Technoform Glass Insulation; TGI-Spacer: www.glassinsulation.us/#sle.
         2) Substitutions: See Section 01 60 00 - Product Requirements.
   4. Spacer Color: Black.
   5. Edge Seal:
      a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
   6. Color: Black.
   7. Purge interpane space with dry air, hermetically sealed.

C. IGU-1Insulating Glass Units: Vision glass, double glazed.
   1. Applications: Exterior glazing unless otherwise indicated or required to be safety glazing.
   2. Space between lites filled with argon.
   3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Match existing.
      b. Coating: Low-E (passive type), on #3 surface.
   4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
   5. Total Thickness: 1 inch.
   6. Thermal Transmittance (U-Value): 0.26 to 0.30 (winter nighttime) and 0.23 to 0.27 (summer daytime).
   7. Visible Light Transmittance (VLT): 15 percent, minimum.
   8. Solar Heat Gain Coefficient (SHGC): 15 percent, maximum.
   9. Glazing Method: Dry glazing method, gasket glazing.

2.04 GLAZING UNITS

A. GL-1 - Monolithic Interior Vision Glazing:
   1. Applications: Interior glazing unless otherwise indicated.
   2. Glass Type: Fully tempered float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch, nominal.
   5. Glazing Method: Dry glazing method, tape and gasket spline.

B. GL-2 - Monolithic Interior Vision Glazing:
   1. Applications: Council Dais railing.
   2. Glass Type: Fully tempered float glass.
   3. Tint: Clear.
   4. Thickness: 1/2 inch, nominal.
   5. Glazing Method: Dry glazing method, tape and gasket spline.

2.05 PLASTIC FILMS

A. Type WF1 - Plastic Film: Mylar type.
   1. Application: Existing windows at locations noted on drawings.
   2. Color: Translucent white.
   3. Manufacturers:
      a. **BASIS OF DESIGN:** 3M Window Films; Fasara: solutions.3m.com.

b. Flexvue Films: www.flexvuefilms.com.
c. Llumar, an Eastman Chemical Company; Solar Control Window Film: www.llumar.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 ACCESSORIES

A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
1. Width: 1 inch.
2. Thickness: 1/16 inch.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color black.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry immediately before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

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SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Epoxy flooring.
   2. Resilient tile and sheet.
   3. Carpet tile.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

F. Patching compound.

1.02 RELATED REQUIREMENTS

A. Section 09 65 00 - Resilient Flooring.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2026.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

E. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

1.04 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.

D. Adhesive Bond and Compatibility Test Report.

E. Copy of RFCI (RWP).

1.05 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.

C. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.07 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
   4. Products:
      a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
      b. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
      c. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:

1. Preliminary cleaning.
2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
5. Remediation, if required.
6. Patching, smoothing, and leveling, as required.
7. Adhesive bond and compatibility test.
8. Protection.

B. Remediations:
1. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
2. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Acoustic insulation.

D. Gypsum sheathing.

E. Gypsum wallboard.

F. Joint treatment and accessories.

G. Bullet resistant sheathing and wallboard.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking and panel products and execution requirements.

B. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).

B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

F. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

G. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.

H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.

I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

J. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

K. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

L. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2024.

M. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

N. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

O. ASTM E413 - Classification for Rating Sound Insulation; 2022.

P. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

Q. UL (FRD) - Fire Resistance Directory; Current Edition.

R. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Test Reports: Bullet resistant sheathing and wallboard.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum three years of experience.

B. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
   1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
   2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

D. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
   2. Marino: www.marinoware.com.
   3. Phillips Manufacturing Co: www.phillipsmfg.com.
   4. The Steel Network, Inc: www.SteelNetwork.com.
   5. PAC International, Inc. www.pac-intl.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C-shaped.
   4. Furring Members: Hat-shaped sections, minimum depth of 1-1/2 inch.
   5. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.

a. Products:
1) Same manufacturer as other framing materials.
2) ClarkDietrich; RC Deluxe Resilient Channel: www.clarkdietrich.com/#sle.
3) Phillips Manufacturing Co; RC-2 Resilient Sound Channel: www.phillipsmfg.com/#sle.
4) Substitutions: See Section 01 60 00 - Product Requirements.

C. Z-Furring: Z furring channel, minimum 0.0179 inch thick base metal; depths as indicated

D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.

E. Preformed Top Track Firestop Seal:
1. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems of fire rating and movement required.

F. Non-structural Framing Accessories:
1. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
b. Products:
1) ClarkDietrich; Pony Wall (PW): www.clarkdietrich.com/#sle.
2) Substitutions: See Section 01 60 00 - Product Requirements.
2. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
1. American Gypsum Company: www.americangypsum.com.
2. CertainTeed Corporation: www.certainteed.com.
3. Continental Building Products: www.continental-bp.com.
4. Georgia-Pacific Gypsum: www.gpgypsum.com.
5. National Gypsum Company: www.nationalgypsum.com.
6. PABCO Gypsum: www.pabcogypsum.com.
7. USG Corporation: www.usg.com.
8. Substitutions: See Section 01 60 00 - Product Requirements.

B. Impact Resistant Wallboard:
1. Application: Circulation spaces, interview rooms, room 2101 and locations noted on drawings.
2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
5. Hard Body Impact: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
7. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.
8. Type: Fire-resistance-rated Type X, UL or WH listed.
9. Thickness: 5/8 inch.

10. Edges: Tapered.
11. Paper-Faced Products:
    a. American Gypsum Company; M-Bloc IR Type X: www.americangypsum.com/#sle.
    b. CertainTeed Corporation; Extreme Impact Resistant Drywall with M2Tech: www.certainteed.com/#sle.
    c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Hi-Impact Gypsum Board: www.goldbondbuilding.com/#sle.
    d. USG Corporation; Sheetrock Brand Mold Tough VHI Firecode X Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

C. Backing Board For Non-Tiled Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M and ASTM C1177; sizes to minimum joints in place; ends square cut.
1. Application: At walls and ceilings of toilets and janitorial areas (whole room including ceilings), and at walls in areas around sinks and equipment with water supply.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D 3273.
3. Water Resistance: suitable for wet areas including showers.
4. Thickness: 5/8 inch.
5. USG Fiberock Aqua-Tough Interior Panel or approved equal.

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: 1/2 inch.
3. Edges: Tapered.

E. Bullet Resistant Sheathing and Wallboard: Woven roving, multi-ply, ballistic grade fiberglass cloth with thermoset polyester resin; comply with UL 752 Level 3.
1. Location: Counters, casework and walls indicated to be bullet-resistant.
2. Thickness: 0.450 inch or as required to meet specified standard.
3. Edges: Square.
4. In 1-Hour Fire-Resistance-Rated Partitions: UL listed for assembly used.
5. Products:
    a. ArmorCore by Waco Composites; Bullet Resistant Fiberglass Panels: www.armorcore.com/#sle.
    b. Armortex.
    c. Bullet Guard.
    d. Basis of Design: Total Security Solutions: https://security.tssbulletproof.com.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 SURFACE REPAIR

A. Surface Repair: As recommended by manufacture for repair of surface cracks and wall resurfacing for extents shown on drawings.
1. Locations: As indicated on Drawings.
2. Fiberglass Mesh: Coated glass fiber mesh sheets in dimension applicable for resurfacing.
3. Fiberglass Mesh Embedment Compound: Use SETTING COMPOUND for embedment of fiberglass mesh sheets.
    a. Basis-of-Design Product: Sheetrock Durabond 90, manufactured by USG Corporation.
4. Surfacing Compound: Apply an all purpose drying type joint compound over the entire surface for a smooth finish.

2.05 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness as required to meet STC rating indicated.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

C. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or stainless steel, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

D. Extruded Aluminum Partition Closure: 6063-T5 temper, tensile strength 31 KSI (ASTM B 221, ASTM B 221 M).
   1. STC Rating: 55 minimum.
      a. Gasket thickness: 1/2 inch.
      b. Gasket color: light gray.
   2. Fire Rating: None.
   3. Model: Select model for closure distances required.
   4. Finish: Match window framing.
   5. Product:
      a. Mull-it-Over: Mullion Trim Caps; mullitoverproducts.com.
      b. Gordon Interior Specialties: Mullion Mate; www.gordon-inc.com
      c. Substitutions: See Section 01 60 00 - Product Requirements.

E. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.

F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

H. Screws for attachment to fire treated wood blocking members.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as permitted by standard unless noted more restrictively on drawings.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs as permitted by standard unless noted more restrictively on Drawings.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Blocking: Install wood blocking or mechanically fastened steel sheet blocking for support of:

1. Framed openings.
2. Countertop and shelf supports
3. Wall mounted cabinets.
4. Plumbing fixtures.
5. Toilet partitions.
6. Toilet accessories.
7. Wall-mounted door hardware.
8. Handrails
9. Corner guards
10. Wall hooks
11. Chalkboards, tack boards, and marker boards.
12. Owner provided wall mounted equipment, whether owner-installed or contractor-installed.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
   1. Do not compress insulation.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Metal Framing: Use screws for attachment of gypsum board.

G. Bullet Resistant Sheathing and Wallboard:
   1. Install bullet-resistant sheathing according to manufacturer's written recommendations and with manufacturer-approved fasteners.
   2. Cover all joints between boards with a 4 inch strip of the same thickness material as the boards, centered on the joint.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish, all corridor walls, and walls with continuous planes greater than 30' in any direction and other areas specifically indicated.
    a. Include wall to receive accent paint.
    b. Include walls to receive wall coverings.
    c. Include walls to receive printed graphic wall coverings.
2. Level 4: Walls and ceilings to receive other paint finishes, unless otherwise indicated.
3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
5. Level 0: Temporary partitions.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
    1. Feather coats of joint compound so that camber is maximum 1/32 inch.
    2. Taping, filling, and sanding are not required at base layer of double-layer applications.

C. Where Level 5 finish is indicated, slightly thin all-purpose joint compound, roll on wall with 24-inc roller and wipe down with drywall knife.

3.07 SURFACE REPAIR PREPERATION

A. Remove all mechanical, electrical and plumbing items and accessories in conflict with wall surfaces to be refinished. This Work is under this Contract; by relevant trade.

B. Clean entire wall area to be resurfaced with cleaning solution. After final rinse, allow wall to completely dry.

C. Rough existing surfaces with glossy paint by light sanding.

D. Verify bonding condition of substrate is adequate for application of new surfacing compounds; no remaining loose material, dust, grease or other contaminants

3.08 SURFACE REPAIR

A. Surfacing Repair Application: Verify temperature, humidity and surface moisture content are within tolerances as specified by the surfacing compound manufacturer.
    1. Apply glass fiber mesh vertically with 2 inch lap and setting compound approximately 1/16 inch thick to cover entire wall surface noted for resurfacing. Neatly form inside and outside corners without excessive material buildup or bridging at inside corners.
    2. Immediately after the initial coat of setting compound and fiberglass mesh apply a second coat of setting compound. Completely encapsulate all fiberglass mesh, voids and surface irregularities.
    3. After the setting compound has set, apply a final coat of all purpose drying type joint compound over the entire wall surface for a smooth consistent finish.

B. Surface to be free of irregular shaped edges and voids at openings, edges and in the field. No fiberglass mesh or indication of towel direction shall be visible after final sanding.

C. Maintain straight edge at all outside and inside corners including, but not limited to: Wall surfaces, doors, windows, convectors, plumbing chases, closets, etc.

D. Finish surface in accordance with levels defined in ASTM C840, as follows:
    1. Level 5: Finish wall surface to receive semi-gloss paint

3.09 FIRE WALL MARKING

A. Refer to Code Analysis Plans and to Reflected Ceiling Plans. At all fire-rated or smoke-partition walls that are located adjacent to accessible (acoustical) ceiling tiles or an accessible attic/ceiling space, provide permanent stenciling indicating hourly rating.
    1. Lettering shall be a minimum 3-inch high with 3/8-inch minimum stroke in a contrasting color incorporated the suggested wording, “FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS” or similar wording.

2. Markings shall be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet, measure horizontally along the wall or partition.
3. Markings shall be on both sides of all rated partitions and in every adjacent room.

3.10 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications (TL#).

B. Tile for wall applications (TL#).

C. Setting bed and grout.

D. Non-ceramic trim.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

B. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

C. Section 10 28 00 - Toilet, Bath, and Laundry Accessories: coordination of recessed and surface-mount items.

1.03 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2023.

B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

C. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).

D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).

G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).

H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).

I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).

J. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

K. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).

L. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.

M. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

N. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

O. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

P. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2026.

1.04 DEFINITIONS

A. Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, setting details, and transition devices.
   1. Submit for each room, after field-verification to reflect actual conditions.

D. Samples: Submit two full size samples of tile, and selection samples for grout.

E. Low-Emitting Materials: Provide verification of VOC content for adhesives and VOC Emissions compliance for mortar, grout, sealants.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than one carton of each type.
   3. Turn over to owner, for storage on-site or off-site.

1.07 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136 and TCNA (HB) on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

C. Installer Qualifications:
   1. Company specializing in performing tile installation, with minimum of five years of documented experience.
   2. Installer Certification:
      a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).

1.08 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for general requirements for mock-up.

B. Construct tile mock-ups where indicated on drawings, incorporating all components specified for the location.
   1. Mockup 1:
      a. Minimum size of mock-up to be approximately 100 square feet and include floor and wall tile, an inside corner, and all associated transition components.
   2. Approved mock-ups may remain as part of the Work.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs of edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

D. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.10 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: Provide Basis of Design manufacturer listed in the Interior Finish Schedule, or a pre-approved standard or custom product from another manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty.
   1. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications:
      a. Open edges of wall tile.
   2. Manufacturers:
      a. Schluter-Systems: www.schluter.com.
      b. Genesis: www.genesis-gs.com.
      c. Profilitec.www.profilitec.com/en/products.html
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   3. Products:
      a. Edge protection for wall tile: Schluter-SCHIENE or approved equal.
   4. Provide all accessory transition and termination pieces for a complete installation.

2.03 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Thin-Set Latex-Portland Cement Mortar Bond Coat for Floor Tile: ANSI A118.4.
   1. Applications: typical for floor tile.
   2. Acceptable Manufacturers and Products:
      a. **BASIS OF DESIGN:** Bostik, Inc.; single flex FS: www.bostik-us.com.
      b. Custom Building Products; Flexbond Crack Prevention Thin-Set Mortar: www.custombuildingproducts.com.
      c. LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com.
      d. Mapei Corporation; Ultraflex 3 Mortar.
      e. Merkrete, by Parex USA, Inc; Merkrete 720 Marble Pro: www.merkrete.com.
      f. ProSpec, an Oldcastle brand; Permalastic System: www.prospec.com.
      g. TEC, H.B. Fuller Construction Products, Inc.; Uncoupling Membrane Mortar: www.tecspecialty.com.
      h. Substitutions: See Section 01 6000 - Product Requirements.

C. Acrylic Premixed Grout: Ready-to-use grout with color-coated quartz aggregate; meets or exceeds ANSI A118.3 and A118.6 covering other grout types.

1. Applications: Use this type of grout at all locations for joints 1/16" to 1/2".
2. Color(s): As indicated in Interior Finish Schedule or as selected by Architect from manufacturer's full range.
3. Products:
    a. Mapei: Flexcolor CQ; www.mapei.com
    b. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 MAINTENANCE MATERIALS

A. Grout Release: Temporary, water-soluble pre-grout coating.
1. Products:
    a. Custom Building Products; Aqua Mix Grout Release: www.custombuildingproducts.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 ACCESSORY MATERIALS

A. Uncoupling Membrane: 1/8 inch polyethylene mat with square dovetail shaped cavities and fleece webbing laminated to the underside to provide a mechanical bond to the substrate adhesive; complying with ANSI A118.10.
1. Applications: Floor tile areas.
2. Manufacturers:
    a. Any Mortar and Grout Manufacturer listed above.
    b. Schluter-DITRA: www.schluter.com.
    c. Compotite Corporation: www.compotite.com.
    d. Noble Company: www.noblecompany.com.
    e. Substitutions: See Section 01 6000 - Product Requirements.

B. Waterproofing Membraneat shower rooms: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10. Provide either applied or sheet type.
1. Fluid or Trowel Applied Type:
    a. Material: Synthetic rubber or acrylic.
    b. Thickness: 25 mils, minimum, dry film thickness.
    c. Products:
        1) ARDEX Engineered Cements; ARDEX 8+9: www.ardexamericas.com/#sle.
        2) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
        3) Mapei Mapelastic AquaDefense with accessories
        4) Substitutions: See Section 01 60 00 - Product Requirements.
2. Mortar Bonded Sheet Type:
    a. Material: Chlorinated polyethylene sheet membrane with polyester fabric laminated to both sides, 30 mils, thick, minimum.
    b. Products:
        1) LATICRETE International, Inc; LATICRETE HYDRO BAN Sheet Membrane: www.laticrete.com/#sle.
        2) Noble Company; NobleSeal TS: www.noblecompany.com/#sle.
        3) Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
   1. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.03 INSTALLATION - GENERAL

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
   1. Use uncoupling membrane under all tile unless other underlayment is indicated.

3.05 CLEANING

A. Clean tile and grout surfaces.

3.06 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

3.07 SCHEDULE: SEE INTERIOR FINISH SCHEDULE IN DRAWINGS.

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SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Refer to Division 21-28 for ceiling mounted devices and fixtures.

1.03 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Acoustical Units: Quantity equal to 5 percent of total installed.
   2. Turn over to owner, for storage on-site or off-site.

1.05 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.06 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. USG: www.usg.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems:
   1. Same as for acoustical units or as listed below.
   2. Chicago Metallic.
   3. Teetanium® Ceiling Grid (manufactured by Cipriani).
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.

B. Acoustical Panels: Refer to Interior Finish Legend for size, edge configuration and basis-of-design product options.

2.03 SUSPENSION SYSTEM(S)

A. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

B. Manufacturers:
   1. Refer to finish schedule on drawings for suspension system manufacturer and product. Physical characteristics are also defined in the drawing finish schedule.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

C. Coordinate with installers of above ceiling work for hanger locations and clearances.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

F. Install hold-down clips on panels within 20 ft of an exterior doors and in all public restrooms.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

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SECTION 09 54 30
SUSPENDED WOOD GRILLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood grilles (used for vertical wall applications).

1.02 REFERENCE STANDARDS

A. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate method of attachment, coordination with thru penetrating items and terminations at adjacent finishes.

C. Product Data: Provide data on acoustic wood grille components and attachment accessories.

D. Samples: Submit two full size samples illustrating material and finish of wood ceiling components.

1.04 QUALITY ASSURANCE

A. Designer Qualifications for Seismic Design: Perform design under direct supervision of Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with at least three years documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.05 MOCK-UPS

A. Construct mock-up large enough to dispay wood slat material attachment, joint, inside corner, top and bottom edge.

B. Locate where directed.

C. Approved mock-up may remain as part of the work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood ceiling components to project site in original, unopened packages.

B. Store in fully enclosed space, flat, level and off the floor.

1.07 FIELD CONDITIONS

A. Do not install suspended wood grille system until wet construction work is complete and permanent heat and air conditioning is installed and operating.

B. Maintain room temperature between 60 degrees F and 86 degrees F and relative humidity between 25 to 55 percent before, during, and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Grille System:
   1. Armstrong World Industries, Inc; Woodworks: www.armstrongceilings.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 WOOD GRILLE SYSTEM

A. Performance Requirements:
   1. Design for maximum deflection of 1/360 of span.

B. Wood Grille: Panelized veneer wood (non-perforated) grille with felt backing material.

1. Classification: ASTM E1264, ASTM E84, Class A, Type F, Form F2, non-perforated.
2. Panel size: Refer to drawings.
3. Blade size: 2 inch depth, 3/4 inch thickness.
4. Blades per foot: 6.
5. Wood: Maple with transparent finish.
6. Backing: Manufacturers standard felt backing material (approximately 1/32" to 1/64" thick).
   a. Backing color: Black.'"
7. Attachment: Direct fastened to substrate thru acoustic backing material.
8. Product: WOODWORKS® ACGI Grille System by Armstrong World Industries, Inc.

2.03 FABRICATION

A. Shop fabricate wood grille components to the greatest extent possible.

B. Fabricate components to allow access as required.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Do not install grille until after interior wet work is dry.

3.02 PREPARATION

A. Coordinate blocking installation to meet requirements of wood grille system.

B. Layout wood grille components in pattern according to interior elevation drawings and as shown on shop drawings.

C. Acclimate wood grille materials by removing from packaging in installation area a minimum of 48 hours prior to installation.

3.03 INSTALLATION

A. Install wood grille system in accordance with manufacturer's recommendations for vertical wall applications.

B. Rigidly secure panelized grille systems to substrate with mechanical fasteners.

C. Fit wood components in place, free from damaged edges or other defects detrimental to appearance and function.

D. Install components in uniform plane, and free from twist, warp, and dents.

E. Cut to fit irregular grid and perimeter edge trim.

F. Make field cut edges of same profile as factory edges, seal and finish according to manufacturer.

G. Install clips, stabilizer bars, and other attachments as indicated to secure wood grille components to substrate.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

3.05 CLEANING

A. Clean and touch up minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring (RF#).

B. Resilient base (RB#).

C. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

1.03 REFERENCE STANDARDS

A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).

1.04 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

B. Verification Samples: Submit two samples, full size illustrating color and pattern for each resilient flooring product specified, including welding rods.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Wall Base: 50 linear feet of each type and color.
   3. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Protect roll materials from damage by storing on end.

E. Do not double stack pallets.

1.06 FIELD CONDITIONS

A. Provide installation area that is weather tight and maintained either permanently or temporarily at ambient service temperature and humidity of 68°F ± 5° F and 50% ± 10% relative humidity, for at least 48 hours prior to, during and 72 hours after the application of the flooring is required.

B. Areas of the flooring that are subject to direct sunlight through doors or windows should have them covered using blinds, curtains, cardboard or similar for the time of the installation and 72 hours after the installation to allow the adhesive to cure. Note: These areas should be installed using wet adhesives only.

1.07 WARRANTY

A. Manufacturer product warranty: Resilient flooring, 5 year warranty.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Plank (RF): Luxury vinyl plank flooring.
   1. Dimensions, pattern and products: Refer to Interior Finish Legend in drawings.

2.02 STAIR COVERING

A. Stair Treads: Rubber; full width and depth of stair tread in one piece; tapered thickness.

1. Dimensions, pattern and products: Refer to Interior Finish Legend in drawings.

2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set as indicated below.
   1. Manufacturers:
      a. Burke Flooring: www.burkemercer.com.
      b. Johnsonite, a Tarkett Company: www.johnsonite.com.
      c. Mannington Commercial Flooring;
      d. Roppe Corp: www.roppe.com.
   2. Height: 4 inch and 6 inch; locations as indicated in Interior Finish Schedule
   3. Thickness (RB-1): 0.125 inch.
      a. Millwork base (RB-2): 0.25-inch thick
   4. Top Set Style:
      a. Coved at resilient flooring or concrete.
      b. Millwork Base - Johnsonite Monument profile (MW-XX-S4); locations as indicated in Interior Finish Schedule.
   5. Finish: Satin.
   6. Length: Roll.
      a. Millwork base: 8 foot long sections.
   7. Color: As indicated in Interior Finish Schedule or as selected by Architect from manufacturer's full range.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer for substrates required (including cmu).

C. Moldings, Transition and Edge Strips: Same material as flooring. Configurations as indicated in the drawings, and to suit conditions.
   1. Colors: To be selected by Architect from manufacturer's full range.
   2. No transition edge strips between carpet and resilient flooring. Provide floor leveling at flooring material transitions such that top of each material is flush.

D. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
   1. The surface shall be free from any paint, wax, oil, grease, and film forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds. The surface should not have any alkaline salts, laitance, mold, mildew, residual adhesive, chemical adhesive removers or anything that may prevent appropriate products bonding to it.
   2. If not sufficiently clean, then the contractor shall provide mechanical means to remove them, such as a dustless diamond grinding, bead-blast or similar with a suitable Hepa vacuum attachment. Review and comply with all relevant local, state and federal regulations.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).

1. Testing should be performed at the correct, controlled ambient service temperature and humidity following the protocol of ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes, using a Wagner Rapid RH probes only.
2. Valid tests and acceptable test results should be provided to the end user and flooring contractor, including documenting with photographs, the location of all tests, recorded % relative humidity levels and temperature of both the concrete subfloor and ambient conditions prior to flooring installation.
3. When tested at the correct ambient temperature and humidity the maximum allowable should be 85% RH for the correct wet adhesive and dryfix adhesive or 75% RH for others.
4. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.

C. Prohibit traffic until filler is fully cured.

D. Vacuum and clean substrate. If required, only use water based sweeping compounds. Do not use any wax or oil based compounds that leave behind a residue that may interfere with the adhesive bond.

E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

F. Perform mat bond tests in each major area (1 per ~1,000 sq. ft.) consisting of the proposed subfloor preparation, mitigation and leveling or smoothing products. Do not proceed with installation until all the results of the bond test are acceptable.

G. Install moisture mitigation system per manufacturer’s instructions.
1. Provide written confirmation and photographs to the building owner and end user that the subfloor was prepared correctly prior to the application of the membrane, and that the membrane was applied correctly (without pin-holes) including confirmation of the gallons used and total square feet installed.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor and wall conditions.

B. Install in accordance with manufacturer's written instructions for substrates encountered.

C. Adhesive-Applied Installation:
1. Spread only enough adhesive to permit installation of materials before initial set.

D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

3.05 INSTALLATION - RESILIENT BASE

A. Follow manufacturer's installation instructions specific to substrate involved.

B. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

C. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.

D. Install base on solid backing. Bond tightly to wall and floor surfaces.

E. Scribe and fit to door frames and other interruptions.

3.06 INSTALLATION - STAIR COVERINGS

A. Install stair coverings in one piece for full width and depth of tread.

B. Adhere over entire surface. Fit accurately and securely.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

A. No wheeled traffic is permitted over floor coverings installed on raised access floor.

B. Prevent all traffic for a minimum of 12 hours and rolling loads for 72 hours to allow the adhesive to cure.

1. If required, after 12 hours protect the flooring from damage during construction operations using Masonite, plywood or a similar product, ensuring first that the flooring surface is free of all debris. Lay panels so that the edges form a butt joint and tape the joint to prevent both movement and debris entrapment underneath them. Inspect immediately before covering and after removal for final acceptance.

END OF SECTION

SECTION 09 67 00
FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied flooring.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

C. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store resin materials in a dry, secure area.

B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.07 FIELD CONDITIONS

A. Maintain minimum temperature in storage area of 55 degrees F.

B. Store materials in area of installation for minimum period of 24 hours prior to installation.

C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring: Epoxy base coat(s), polyurethane top coat, no aggregate.
   1. System Thickness: 40 mils, nominal, dry film thickness (DFT).
   2. Texture: Smooth.
   3. Sheen: High gloss.
   4. Color: As selected by Design Professional.
   5. Products:
      a. Key Resin Company; Key High-Build Coating System: www.keyresin.com/#sle.

b. PPG Flooring; Concrete Epoxy Primer Clear FLR900-0, Low Gloss, with Self-Leveling Epoxy FLR600 Series, High Gloss, and Wear Resistant Urethane FLR400-0, Satin: www.ppgpaints.com/#sle and www.ppgpmc.com/home.aspx/#sle.
c. BASIS OF DESIGN: Sherwin-Williams Company; ARMORSEAL® 8100 WATER BASED EPOXY / ARMORSEAL HS POLYURETHANE: www.protective.sherwin-williams.com/#sle.
d. Sika Corporation; Sikafloor Morritex Coating System: www.sikafloorusa.com/#sle.
e. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

A. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.

B. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).
1. Test in accordance with Section 09 05 61.
2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.
3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Prepare concrete surfaces according to ICRI 310.2R.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

E. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness required by manufacturer.

C. Finish to smooth level surface.

3.04 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 09 68 13
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered (CPT#)

B. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

B. Section 09 65 00 - Resilient Flooring; resilient base and flooring transitions.

1.03 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

D. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Indicate layout of joints and direction of carpet pile.

D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.
   3. Turn over to owner, for storage on-site or off-site.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

C. Ventilate installation area during installation and for 72 hours after installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide ten year manufacturer warranty for wear.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide Basis of Design manufacturer listed, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty.

2.02 MATERIALS

A. Tile Carpeting, Type CPT#: Heterogenous construction of nylon tufted textured loop, manufactured in one color dye lot.

B. Walk-Off Carpet/ Entry Mat (WOC#): Heterogenous construction.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Transition Strips:
   1. Walk-off Carpet to Concrete: Metal, recessed.
      a. Product: “Schluter; RENO-U" manufactured by Schluter-Systems; or approved equivalent.
         1) Finish: Brushed Stainless steel, unless otherwise indicated.

C. Adhesives: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.

C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
   1. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay out carpet and locate seams in accordance with shop drawings.
   1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
   2. Do not locate seams perpendicular through door openings.
   3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
   4. Locate change of color or pattern between rooms under door centerline.

5. Provide monolithic color, pattern, and texture match within any one area.

F. Fully adhere carpet tile to substrate.

G. Trim carpet tile neatly at walls and around interruptions.

H. Complete installation of edge strips, concealing exposed edges.

3.03 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

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SECTION 09 72 00
WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall covering (WC#).

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Substrate and finish for wall covering.

B. Section 09 90 00 - Painting: Preparation and priming of substrate surfaces.

C. Section 10 14 05 - Applied Graphics: Digital wall covering

1.03 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020 (Reapproved 2025).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

D. FS L-P-1040 - Plastic Sheets and Strips (Polyvinyl Fluoride); Federal Specifications and Standards; Revision B, 1977.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Prior to start of installation arrange a meeting on site to familiarize installer and installers of related work with requirements relating to this work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on wall covering and adhesive.

C. Shop Drawings: Indicate wall elevations with seaming layout.

D. Samples: Submit two samples of wall covering, 18 by 18 inch in size illustrating color, finish, and texture.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements for list of required materials.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of experience and approved by manufacturer.

1.07 MOCK-UP

A. Provide panel, two panel drops wide, full height, illustrating installed wall covering, joint seaming technique, and edge.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

C. Do not store roll goods on end.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

1.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide three year manufacturer warranty for degradation of finish.

PART 2 PRODUCTS

2.01 WALL COVERINGS

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

B. Wall Covering (WC#): Vinyl roll stock, conforming to the following:
   1. Comply with ASTM F793/F793M, Category V, Type II.
   2. Manufacturer/ Pattern/ Color: see Interior Finish Schedule

C. Wood-look Wall Covering (used on soffits and ceilings where indicated): wood-look pressure sensitive vinyl wall covering.
   1. Size: 4 feet widths by 164 foot lengths
   2. Thickness: 8 mils (0.2 mm)
   3. Install with manufacturer's recommended substrate primer
   4. Pattern/Color: as indicated in Interior Finish Schedule.
   5. Manufacturers:
      a. **BASIS OF DESIGN:** 3M DiNoc Architectural Finishes
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Termination Trim: extruded aluminum j-cap, clear anodized/satin finish; 1/4-inch maximum face dimension.
   1. Length: as required for wall covering installation as indicated in drawings.
   2. Product:
      a. Indoff IND-9 / J-Cap; www.ahutton.com
      b. Extrude-A-Trim J-Channel
      c. Eagle E-80 J-Cap
      d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

F. Substrate Primer and Sealer: manufacturer's recommended type. Required for Level 5 painted gypsum board and unpainted MDF substrates.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are prime painted and ready to receive work, and comply with requirements of wall covering manufacturer.
   1. Verify wall was constructed with a Level 5 finish.

B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section.

E. Marks: Seal with shellac those that may bleed through surface finishes.

F. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

G. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Use wall covering in pattern sequence.

C. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.

D. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

E. Horizontal seams are not acceptable.

F. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

G. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.

H. Do not install wall covering more than 1/4 inch below top of resilient base.

I. Cover spaces above and below windows, above doors, in pattern sequence from roll.

J. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.

K. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

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SECTION 09 90 00
PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish **interior** surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Fabricated metal ladders.
   3. Prime surfaces to receive wall coverings.
   4. Mechanical and Electrical:
   5. Gypsum Board: Finish all surfaces exposed to view.
   6. Steel Doors and Frames: Finish all surfaces exposed to view.
      a. Paint all surfaces, including top and bottom edge surfaces.
   7. Shop-Primed Metal Items: Finish all surfaces exposed to view.
   8. MDF Access Panel.

D. Do Not Paint or Finish the Following **interior** Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
   6. Floors, unless specifically indicated.
   7. Glass.
   8. Acoustical materials, unless specifically indicated.
   9. Concealed pipes, ducts, and conduits.

E. Scope: Finish **exterior** surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Metal.

F. Do Not Paint or Finish the Following **exterior** Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically indicated.
   8. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
   9. Glass.
   10. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Fabricated items.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Doors and frames requiring field-painting.

C. Section 09 21 16 - Gypsum Board Assemblies: Substrate requiring paint; painting of above-ceiling firewall warning signs.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

D. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

E. SSPC-SP 2 - Hand Tool Cleaning; 2018.

F. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

G. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.04 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
   2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   3. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

B. Samples: Submit two paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Design Professional before preparing samples, to eliminate sheens not required.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Paint and Finish Materials: 1 gallon of each color; store where directed.
   2. Label each container with color in addition to the manufacturer's label.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.

D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
   1. If a single manufacturer cannot provide specified products; minor exceptions will be permitted provided approval by Design Professional is obtained using the specified procedures for substitutions.
   2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.

B. Paints: Basis-of-Design manufacturer and product are included with the coating system types and performance requirements.
   1. Diamond Vogel Paints: www.diamondvogel.com/#sle.
   2. PPG Paints: www.ppgpaints.com.
   3. Precision Coatings: www.roddapaint.com/#sle.
   4. Sherwin-Williams Company: www.sherwin-williams.com.
   5. Tnemec Company, Inc: www.tnemec.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Primer Sealers: Same manufacturer as top coats.
   1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each paint material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Colors: Provide colors indicated in Interior Finish Schedule, or if not indicated, as selected from manufacturer's full range of available colors.
   1. Allow for same number of colors indicated in Finish Schedule, plus two additional samples, without additional cost to Owner.
   2. Extend colors to surface edges; colors may change at any edge as directed by Design Professional.

2.03 PAINT SYSTEMS - INTERIOR

A. Gypsum Board and Wood:
   1. Latex Primer: Zero VOC Latex-Based. Applied to result in a dry film thickness of not less than 1.5 mils.
      a. Application: Typical interior finished gypsum.
      b. Product(s):
         1) Sherwin Williams; ProMar 200 Zero VOC Primer.
   2. Acrylic Topcoat: Eggshell Acrylic-Latex Enamel. Applied to result in a dry film thickness of not less than 1.6 mils per coat. (Provide flat base for ceiling applications)
      a. Application: Typical interior finished gypsum.

b. Product(s):
1) Sherwin-Williams; ProMar® 200 HP Zero V.O.C. Acrylic Latex Enamel.

3. Epoxy Topcoats: Semi-gloss, low-odor, waterborne epoxy applied in a minimum of two coats at spreading rate recommended by manufacturer to achieve a total dry film thickness of 4.0 to 6.0 mils.
a. Application: Interior finished gypsum; toilet rooms and wet areas.
b. Products:
1) Sherwin-Williams: Pro Industrial Water Based Pre-Catalyzed Epoxy, K45W1151.

B. Concrete Unit Masonry:
1. Acrylic Block Filler/Prime. Applied to result in a dry film thickness of not less than 8.0 mils.
a. Application: Concrete, typical (non burnished) unit masonry.
b. Product(s):
1) S-W LOXON Acrylic Block Surfacer LX01W0200.
2. Epoxy Intermediate Coat: Gloss, waterborne epoxy. Appllied to achieve a total dry film thickness of 4.0 to 6.0 mils.
a. Application: Concrete, typical unit masonry.
b. Product(s):
1) S-W Pro Industrial WB Epoxy Gloss B73-300 Series.

C. Ferrous and Hot Dipped Galvanized Metal:
1. Single Component metal primer. Applied to result in a dry film thickness of not less than 2.0 mils.
a. Applications: Non-exterior hollow metal doors and frames.
b. Product(s):
1) Sherwin-Williams; Pro Industrial Pro-Cryl Primer, B66W1310.
2. High Performance Coating (HPC) Water-Based Enamel: Factory-formulated semigloss polymer modified enamel for interior application. Applied to result in a dry film thickness of not less than 1.7 mils per coat, minimum 2 coats.
a. Application: Interior side of hollow metal doors and frames exposed to exterior, interior metal fabrications; stairs, railings, gratings, metal panels where indicated to receive opaque finish coatings.
b. Pencil Hardness (ASTM D3363): 3H or harder.
c. Flexibility (ASTM D522): No Cracking.
d. Product(s):
1) Sherwin-Williams; Pro Industrial Waterbased Alkyd Urethane Enamel, B53-1151.
3. Acrylic Dryfall (MPI #118): Factory-formulated self-priming flat acrylic-latex interior dryfall. Applied to result in a dry film thickness of not less than 2.5 mils per coat.
a. Applications: Exposed overhead steel structure.
b. Product(s):
1) Sherwin-Williams; Pro Industrial Waterborne Acrylic Dryfall Flat B42 Series.

2.04 PAINT SYSTEMS - EXTERIOR

A. Ferrous and Hot Dipped Galvanized Metal:
1. Application: Steel overhead door jambs, exterior hollow metal doors and frames, metal fabrications, columns and beams.
2. Epoxy Base Coat: Applied to result in a dry film thickness of 5.0 to 10.0 mils.
a. Product(s):
1) Sherwin-Williams; Macropoxy 646 Fast Cure Epoxy.
2) Substitutions: Section 01 60 00 - Product Requirements.
3. Acrylic Polyurethane Top Coat: Applied to result in a dry film thickness of 3.0 to 6.0 mils.
a. Product(s):
1) Sherwin-Williams; Acrolon 218 HS.

2) Substitutions: Section 01 60 00 - Product Requirements.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces and to achieve the finishes specified whether specifically indicated or not; commercial quality

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

D. Hybrid Elastomeric Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
   1. Hardness Range: 15 to 25, Shore A, when tested in accordance with ASTM C661.
   2. Color: Match adjacent finished surfaces.
   3. Products:
      a. Sherwin-Williams Company; Stampede 100 Low-Modulus Hybrid Urethane Sealant: www.sherwin-williams.com/#sle.
      b. Sherwin-Williams Company; Stampede 1H Hybrid Sealant: www.sherwin-williams.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been adequately prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. If substrate preparation is the responsibility of another installer, notify Design Professional of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
   1. Masonry, Concrete, and Concrete Masonry Units: 12 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing paints or finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

H. Masonry:
   1. Prepare surface as recommended by top coat manufacturer.

2. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

I. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

J. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2 followed by SSPC-SP 16.

K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

L. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply paint coatings with high quality equipment suitable for the material being applied. Products may be roller applied or spray applied and back rolled. Use minimum 1/2 inch nap paint roller for either application method.

C. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied. When manufacturer does not specify, allow 24 hours for interior paint and 48 hours for exterior paint to dry.

F. Apply paint coatings maintaining a continuous wet edge across the entirety of the application surface. Termination and stopping points shall be coordinated with natural breaking points, corners and panelized units.

G. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

H. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

I. Sand metal surfaces lightly between coats to achieve required finish.

J. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

3.06 COLOR SCHEDULE: SEE INTERIOR FINISH SCHEDULE IN DRAWINGS

END OF SECTION

SECTION 10 11 00
VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Markerboards (MKBD#).

B. Tackable Surface (TK#).

C. Hardware and Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

B. Section 06 41 00 - Architectural Wood Casework: Coordination for tackable surfaces.

C. Section 09 21 16 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption & Sound Absorption Coefficients by the Reverberation Room Method.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data on markerboard, trim, and accessories.

C. Shop Drawings: Indicate wall elevations, dimensions, joint locations , special anchor details.

D. Samples: Submit two samples 6 by 6 inch in size illustrating materials and finish, color and texture of markerboard, tackboard, and trim.

E. Maintenance Data: Include data on regular cleaning, stain removal.

1.05 PROJECT CONDITIONS

A. Field measure prior to preparation of Shop drawings and fabrication to ensure proper fit.

B. Comply with manufacturer's recommendations for acclimating area for interior moisture and temperature to approximate normal occupied conditions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of visual display boards with spaces sufficiently complete so that visual display boards can be installed upon delivery.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide Ten warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide Basis of Design manufacturer listed for each product, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty:

B. Felt Tackable Surface (TK1):
   1. Acoufelt.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Magnetic Markerboards (MKB#):

1. Deko Markerboards; www.dekomarkerboards.com
2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 VISUAL DISPLAY UNITS

A. Magnetic Markerboards (MKB#): Opaque resin fused to metal with factory finished edges.
   1. Face Color: As indicated on drawings.
   2. Size: As indicated on Drawings and in Finish Schedule.
   3. Frame: No frame.
   4. Attachment: Equal to Bond.™ Setting by Deko. (provide with ~3/16-inch shim material for locations adjacent to TKB1 tackboards. Finished face of panels to be in same plane).
   5. Accessories:
      a. One Markerboard Kit for every two boards and 12 magnets per markerboard (in addition to magnets provided in kits).
   6. Product: Equal to Deko Premier Markerboards with Bezel Trim.

B. Tackable Surface (TK1): Felt (100% polyester).
   1. Thickness : 12 mm.
   2. Color: as indicated in Finish Schedule.
   3. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
   4. Size: As indicated in Drawings and Finish Schedule.
   5. Frame: No frame.
   6. Mounting: Adhered.
   7. Product: Acoufelt Wall Panel.

2.03 MATERIALS

A. Glass: optically clear, tempered
   1. Optically clear hard coating on face, permanent opaque color on back
   2. Weight: 0.94 lbs SF (non-magnetic), 2.44 lbs SF (magnetic).
   3. Impervious to staining from dry-erase, wet-erase and permanent markers.

B. Adhesives: Type used by manufacturer.

2.04 ACCESSORIES

A. Shim Material: Slat or panel thickness product as applicable. Paint or conceal shim material to match substrate in locations where it may be partially visible.

B. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.

C. Mounting Brackets: Concealed.

D. Termination Trim (tackable surface): J-trim; black satin, color anodized aluminum, 1/4-inch trim; Koroseal JT12-00, Schluter-SCHIENE AE60, or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings, and as required for owner-provided boards.

3.02 PREPARATION

A. Acclimate surfaces by removing from packaging in installation area not less than 24 hours before application.

B. Remove switchplates, wall plates, and surface-mounted fixtures where tackable wall paneling is applied. Reinstall items on completion of installation.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install boards in accordance with manufacturer's instructions.

B. Secure units level and plumb, and at the height indicated.

C. Butt Joints: Install with tight hairline joints.

3.04 CLEANING AND PROTECTION

A. Clean board surfaces in accordance with manufacturer's instructions.

B. Cover with protective cover, taped to frame. Protect installed markerboards from damage during construction.

C. Remove temporary protective cover at Date of Substantial Completion.

END OF SECTION

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SECTION 10 14 00
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Code-required room and door signs, for stairs, restrooms, mechanical rooms and occupancy.

B. Interior directional and informational signs.

C. Dimensional letters

D. Storm shelter signs.

E. Identification signs.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: coordination for placement of dimensional lettering on concrete retaining wall.

B. Electrical: Exit signs required by code.

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Shop Drawings: Indicate sign styles, lettering, locations and dimensions of each interior sign.

D. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

E. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

F. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with requirements of ICC/ANSI A117.1 and ADAAG.

1.06 MOCK-UP

A. Provide mock-up of 3D departmental signage.

B. Locate where directed.

C. Approved mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.08 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS AND FABRICATORS

A. Plaque Signs:
1. A.R.K. Ramos Architectural Signage Systems
2. ASI Signs.
3. Best Sign Systems, Inc: www.bestsigns.com.
4. Evolving Edge
5. FASTSIGNS: www.fastsigns.com/#sle.
6. Inpro: www.inprocorp.com/#sle.
7. Metal Arts; Division of L&H Manufacturing Company
8. Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
9. Nagle Signs
10. Nelson-Harkins Industries
11. PrideNeon Sign Company; www.prideneon.com
12. Rapids Reproductions.
13. Serigraphics
14. Southwell Company, The.
15. Basis of Design: Vista System Art ADA Signage, Style: Sanford; www.vistasystem.com
16. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Dimensional Letter Signs:
1. ASI Signs
2. Cosco Industries: www.coscoarchitecturalsigns.com/#sle.
3. FASTSIGNS: www.fastsigns.com/#sle.
4. Inpro: www.inprocorp.com/#sle.
5. Signs and Designs.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 GENERAL

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Code Required Room and Door Signs:
1. Sign Type: 1/8 inch subsurface painted, non-glare acrylic faceplate with a 1/4 inch horizontal, brushed aluminum accent bar.
2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II Braille.
3. Character Height: 1 inch.
4. Sign Height: Refer to drawings.

C. Color and Font: Unless otherwise indicated:
1. Character Font: As indicated in drawings.
2. Character Thickness: 1/32-inch
3. Background Color: As selected by Design Professional or Owner from full range.
4. Character Color: Contrasting color.
5. Braille: Grade II Raster Braille with domed surface.

D. General: Substrates and Inserts
1. Raised Letter Signs with Braille and optional graphics on acrylic plastic (ADA sign).
a. Base acrylic material:
1) Sign material must have non-glare (matte) surface.
(a) Clear.
(b) Solid embedded color material.

2) Sign color: Color as selected from manufacturer's standard options.
b. Edges:
1) Square to conform to sign frame interior space.
c. Raised characters
1) Character Font: To be selected from manufacturer's full range of fonts.
2) Character Color: To be selected from manufacturer's full color range.
3) Character Thickness: 1/32 inch.
d. Braille:
1) Grade II Raster Braille with domed surface.

E. Interior Directional and Informational Signs:
1. Sign Type: Same as room and door signs.

F. Emergency Evacuation Maps:
1. Allow for one map per elevator lobby.
2. Map content to be provided by Owner.
3. Use clear plastic panel silk-screened on reverse, in brushed aluminum frame, screw-mounted.

G. Acrylic Dimensional Letter Signs: 3/4 inch thick with accent color edges as indicated in drawings.
1. Dimensions and font: Refer to drawings.
2. Color: Custom colors as indicated in drawings.
3. Mounting: Blind stud mount with silicone.

H. Stainless Steel Dimensional Letter Signs: Type 304 typical.
1. Height, thickness, mounting, approximate number of letters; refer to drawings.

2.04 PLAQUE SIGNS

A. Flat Signs: Signage media without frame.
1. Edges: Square.
2. Corners: Radiused.
3. Wall Mounting of One-Sided Signs: Tape adhesive.
4. Wall and Ceiling Mounting of Two-Sided Signs: Aluminum wall bracket, powder coated, color selected from manufacturer's standard colors, attached with screws in predrilled mounting holes, set in clear silicone sealant.
5. Suspended Mounting: Stainless steel suspension cables, cable clamps, and ceiling fastener suitable for attachment to ceiling construction indicated.

B. Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica.
2. Character Case: Upper case only.
3. Background Color: As selected by Design Professional or Owner from manufacturer's full range.
4. Character Color: Contrasting color.
5. Braille: Grade II Raster Braille with domed surface

2.05 PICTOGRAMS

A. Pictograms or symbols must be located on a field of at least 6 inches in height.

B. Provide descriptive text located directly below the pictogram field. Braille and tactile text may not intrude into the 6 inch field.

2.06 COLORS

A. Background Color: As selected by Owner or Architect.

B. Character Color: Contrasting color.
1. Light characters against dark backgrounds or dark characters against light backgrounds are both acceptable.

2.07 VINYL APPLIED LETTERING

A. Location(s): Applied to interior face of exterior glazing and doors, as indicated on drawings.

B. Vinyl Letters:
   1. Material: 3- to 3.5-mil thick, weather-resistant vinyl film with release liner on the back and carrier film on the front for on-site alignment and application.
      a. Die Cut and pre-spaced
   2. Height: to match existing.
   3. Text, Font and Characters: As indicated on Drawings.
   4. Color: As selected by design professional.

2.08 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal at interior. Stainless Steel at exterior.

B. Exposed Screws: Stainless steel, countersunk.

C. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
   1. Height: All tactile characters shall be 48 inches minimum and 60 inches maximum above the adjacent floor, measured from the baseline of the characters.
   2. Location: All room signs should be mounted adjacent to the latch side of the door, except the following:
      a. Double doors: mount sign on the inactive leaf. If both doors are active, mount sign to the right of the right hand door.
      b. Signs can be mounted on push doors that open in and have automatic door closures without hold-open devices.
      c. If no wall space exists on the latch side of the door, mount sign on the nearest adjacent wall.
   3. Distance from door: Signs shall have a minimum 18 x 18 inches space on the floor, centered on the sign, beyond the arc of any door swing between the closed position and 45° open position.
   4. Provide backer plate for all signs mounted to glass.

3.04 PROTECTION

A. Protect from damage until Substantial Completion; repair or replace damaged items.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 10 14 05
ENVIRONMENTAL GRAPHICS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Self-adhesive, custom printed graphics, applied to:
   1. Gypsum board walls.
   2. Glazing.

1.02 RELATED REQUIREMENTS

A. Section 09 90 00 - Painting: Preparation and priming of substrate surfaces.

1.03 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020 (Reapproved 2025).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's technical data for products and adhesives, and installation instructions.

C. Shop Drawings: Submit shop drawings for verification of final graphic design. Coordinate with Architect on final design. Include plans, elevations, and large-scale dimensioned details art/graphic, layout, and location.

D. Samples: Submit full color chart/samples for review by the Architect.

E. Maintenance Data: Provide user manual for Owner maintenance and repair of installed product.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer.

1.06 MOCK-UP

A. Provide full-size mock-ups, illustrating final graphic design, surface texture of product, and color.
   1. Provide one paper mockup for finalizing scale, for each type/design of wall graphic.
   2. Provide one actual material mockup for finalizing color and finish, for each type/design of wall graphic. Allow for three different printings for color adjustments.

B. Locate where directed.

C. Mock-up may NOT remain as part of the Work if accepted.

1.07 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Inspect materials at arrival on site, to verify acceptability.

C. Protect packaged adhesive from temperature cycling and cold temperatures.

D. Do not store roll goods on end.

E. Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.

F. Store panels in temperature controlled environments. Leave protective blue film on panel until ready to use.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain air temperature and structural base temperature at installation area between 65F (18C) and 80F (26C) for 48 hours before, during and 24 hours after installation.

C. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

D. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

PART 2 PRODUCTS

2.01 GENERAL

A. Self-adhesive vinyl graphics shall be produced from artwork as provided by the Design Professional.

B. Artwork: Concept provided by Architect, Logo art provided by Owner, art production by manufacturer.

2.02 FABRICATORS (PRINTERS/INSTALLERS):

A. ASI Sign Systems.

B. Beeline & Blue.

C. Evolving Edge.

D. Rapids Reproductions, Inc.

E. Substitutions: See Section 01 6000 - Product Requirements.

2.03 DIGITAL WALL COVERING

A. Manufacturers:
   1. **BASIS OF DESIGN:** 3M: www.3m.com.
   2. DL Couch: www.dlcouch.com.
   3. Koroseal/RJF International: www.koroseal.com/#sle.
   4. MDC Wallcoverings: www.mdcwall.com/#sle.
   5. National Wallcovering Level Digital Wallcoverings: www.findyourlevel.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

C. Custom Printed wall covering; repositionable, premium film for screen print multicolored graphics applied to level 5 finish drywall.
   1. Locations: As noted on drawings.
   2. Manufacturer/ Product: 3M ControlTac.
   3. Thickness: 2 mil thick with 1 mil acrylic adhesive and a release liner.
   4. Artwork: Concept provided by Architect, art production by manufacturer.
   5. Finish: Matte.
   6. Coating: on laminate protective coating.
   7. Substrate to be finished to Level 4 and primed. Do not use Low-VOC paint for substrate.

8. Mock-up required of 24” wide by full height of each design required. Prints must be color calibrated for final mock-up.

D. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.

E. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

F. Substrate Primer and Sealer: Manufacturer's recommended type.

2.04 GRAPHIC FILM

A. Manufacturers:
1. Flexvue Films: www.flexvuefilms.com/#sle.
2. Kuraray America, Inc: Trosifol Decorative: www.kuraray.us.com/#sle.
3. Llumar, an Eastman Chemical Company: Solar Control Window Film: www.llumar.com/#sle.
4. Look Architectural Coatings: www.lookco.com
5. National Wallcovering Level Digital Wallcoverings: www.findyourlevel.com
6. **BASIS OF DESIGN:** 3M Window Film; www.3m.com/windowfilm;
7. Substitutions: See Section 01 6000 - Product Requirements.

B. Decorative Film for glazing: Translucent polyester film; dimensionally stable, UV stable; surface-applied and as interlayer in laminated glazing as indicated in drawings.
1. Locations: As indicated on interior elevations.
2. Opacity: as indicated in Finish Schedule or as selected by Architect from manufacturer's full range.
3. Thickness: 2 mil thick with 1 mil acrylic adhesive and a release liner
4. Size: 1.52 m x 45.7 m
5. Finish: Matte
6. Coating: on laminate protective coating

C. Decorative Film for Concrete Masonry Units (CMU): Translucent polyester film; dimensionally stable, UV stable; surface-applied and as interlayer in laminated glazing as indicated in drawings.
1. Adhesive: Clear, pressure-sensitive.
2. Finish: Luster.
3. Removability: Permanent.
4. Thickness: 3 mil.
5. Color: Pantone 7538 C.
6. Basis-of-Design Series and Manufacturer: 3M IJ180CV3-10 base film with Scotchcal™ Luster Overlaminate 8520.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work, and comply with requirements of wall covering manufacturer.

B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section.

E. Marks: Seal with shellac those that may bleed through surface finishes.

F. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

G. Vacuum clean surfaces free of loose particles.

3.03 SURFACE-APPLIED INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Do not install adhesive film when ambient temperature is lower than recommended by manufacturer.

C. Clean and prepare substrates according to manufacturer’s instructions.

D. Install neatly, with horizontal edges level.

E. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

F. Install termination trim where indicated.

G. Protect from damage until Substantial Completion; repair or replace damage items.

3.04 CLEANING

A. At completion of installation, clean soiled surfaces in accordance with manufacturer's instructions. Remove any leftover adhesive residue.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

A. Protect installed graphics from subsequent construction operations and damage until acceptance by Owner.

END OF SECTION

SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

B. Urinal and vestibule screens.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

B. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 SUBMITTALS

A. Product Data: Provide data on panel construction, hardware, and accessories.

B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

1.05 WARRANTIES

A. Provide manufacturer's standard limited coverage against defects in the phenolic core and finish; minimum ten (10) years after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Solid Plastic Toilet Compartments:
   1. Accurate Partitions Corp; Product Floor Anchored / Overhead Braced Series: www.accuratepartitions.com.
   2. Basis-of-Design: Mills Company / subsidiary of Bradley Corp; Product Floor Anchored / Overhead Braced Series: www.bradleycorp.com.
   3. Global Steel Products Corp; Product Floor Anchored / Overhead Braced Series: www.globalpartitions.com.
   4. Hadrian Toilet Partitions.
   5. Scranton Products; Hiny Hiders Partitions: www.scrantonproducts.com/#sle.
   6. Substitutions: Section 01 60 00 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor-mounted headrail-braced.
   1. Color: Refer to drawings, Finish Schedule.
   2. Doors:
      a. Thickness: 1 inch.
      b. Width: 24 inch.
      c. Width for Handicapped Use: 36 inch, out-swinging.
      d. Height: 55 inch.
   3. Panels:
      a. Thickness: 1 inch.
      b. Height: 55 inch.
   4. Pilasters:
      a. Thickness: 1 inch.
      b. Width: As required to fit space; minimum 3 inch.

2.03 ACCESSORIES

A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
   1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Extruded aluminum, anti-grip profile.

C. Wall and Pilaster Brackets: Stainless steel; manufacturer's standard type for conditions indicated on drawings.

D. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.

E. Hinges: Stainless steel, manufacturer's standard finish.
   1. Pivot hinge gravity type or continuous-type hinge; Selected type must be self closing and coordinated with privacy features.

F. Door Hardware: Stainless steel, manufacturer's standard finish.
   1. Door Latch: Slide type with exterior emergency access feature. Coordinate with privacy trim or privacy profile.
   2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.
   3. Provide door pull for outswinging doors.

G. Coat Hook: One per compartment, mounted on door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 22 39
FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Top-supported folding panel partitions, horizontal opening.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking and track support shimming.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

E. ASTM E413 - Classification for Rating Sound Insulation; 2022.

F. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions; 2012 (Reapproved 2026).

G. ASTM E596 - Standard Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures; 2022.

H. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

I. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on partition materials, operation, hardware and accessories, track switching components, and colors and finishes available.

C. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.

D. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, adjacent construction and finish trim, and stacking depth.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until installation.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Folding Panel Partitions - Horizontal Opening:
   1. Kwik-Wall Company: www.kwik-wall.com/#sle.
   2. Moderco, Inc: www.moderco.com/#sle.
   3. Basis of Design: Modernfold, a DORMA Group Company; Acousti-Seal® Legacy®: www.modernfold.com/#sle.

4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

A. Folding Panel Partitions: Side opening; paired panels; side stacking; manually operated.

B. Panel Construction:
   1. Frame: 16 gauge, 0.0598 inch thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
   2. Substrate: Plywood.

C. Panel Finishes:
   1. Facing: Durable woven fabric.

D. Panel Seals:
   1. Panel to Panel Seals: Grooved and gasketed astragals, with continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
      a. Include continuous gasketed seals for connection to existing operable panels.
   2. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.

E. Suspension System:
   1. Track: Formed steel; 1-1/4 by 1-1/4 inch size; thickness and profile designed to support loads, steel sub-channel and track connectors, and track switches.
   2. Carriers: Nylon wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.

F. Performance:
   1. Acoustic Performance:
      a. Noise Reduction Coefficient (NRC): ASTM E596, NRC of 0.65 minimum.
      b. Sound Transmission Class (STC): 48 to 52 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft.
   2. Surface Burning Characteristics of Panel Finish: Flame spread/smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   3. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.

G. Accessories:
   1. Ceiling Closure: White enameled ceiling closure; aluminum jamb and head molding, fittings and attachments, and intermediate meeting posts.
   2. Jamb closure for existing perpendicular door to meet new door.
   3. Egress door(s) in partition, as shown on plans.
   4. Pocket Enclosures: Door, frame, and trim to match adjacent walls.
   5. Acoustic Sealant: As recommended by partition manufacturer.

2.03 MATERIALS

A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Vinyl Coated Fabric: ASTM F793 Category VI, polyvinyl fluoride (PVC) finish for washability and improved flame retardance; color as selected by Architect from manufacturer's standard range.

C. Hardwood Plywood: Face species Beech, plain sliced, book matched, veneer core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1; glue type as recommended for application.

D. Acoustic Insulation:
   1. Type: As required for acoustic performance indicated.
   2. Thickness: As required for acoustic performance indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that required utilities are available, of the correct characteristics, in proper location, and ready for use.

C. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.

D. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

3.02 INSTALLATION

A. Install partition in accordance with manufacturer's instructions and ASTM E557.

B. Install acoustic sealant to achieve required acoustic performance.

C. Coordinate electrical connections.

3.03 ADJUSTING

A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.

B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.

C. Adjust partition assembly to achieve lightproof seal.

3.04 CLEANING

A. Clean finish surfaces and partition accessories.

B. Condition markerboard surfaces in accordance with manufacturer's instructions.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate operation of partition and identify potential operational problems.

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SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Corner guards.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking for wall and corner guard anchors.

1.03 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2026.

B. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2021.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

D. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2023.

E. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Stock Materials: One package(s) of minimum 102 inches long unit of covers for corner guards.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.

B. Protect work from moisture damage.

C. Protect work from UV light damage.

D. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Corner Guards:
   1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
   2. Inpro: www.inprocorp.com/#sle.
   3. Koroseal Interior Products: www.koroseal.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE CRITERIA

A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.

B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.

C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.03 PRODUCT TYPES

A. Corner Guards - Surface Mounted:
   1. Material: Type 304 stainless steel, No. 4 finish, 16 gauge, 0.060 inch thick.
   2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
   3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   4. Width of Wings: 2 inches.
   5. Corner: Square.
   6. Color: As selected from manufacturer's standard colors.
   7. Length: One piece.

2.04 FABRICATION

A. Fabricate components with neat fitting joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that field measurements are as indicated on drawings.

C. Verify that substrate surfaces for adhered items are clean and smooth.
   1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.

D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.

B. Position corner guard directly above wall base to ceiling.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/16 inch.

B. Maximum Variation From Level or Plane For Visible Length: 1/16 inch.

3.04 CLEANING

A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

SECTION 10 28 00
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contractor Furnished, Contractor Installed (CFCI) items, including but not limited to:
   1. Framed Mirrors.
   2. Grab Bars.
   3. Coat Hooks.
   4. Shelves.

B. Commercial shower and bath accessories, including but not limited to:
   1. Shower Rods.
   2. Shower Curtains.
   3. Shower Seats.

C. Installation of Owner Furnished, Contractor Installated (OFCI) items, including but not limited to:
   1. Toilet Paper Dispenser.
   2. Paper Towel Dispenser.
   3. Soap Dispenser.
   4. Sanitary Napkin Disposals.
   5. Anti-bacterial Gel Dispenser.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed supports for accessories, including blocking.

B. Section 08 80 00 - Glazing: Sheet mirror glass for frameless wall application.

C. Section 09 21 16 - Gypsum Board Assemblies; substrate.

D. Section 09 30 00 - Tiling; substrate finish, coordination with joints and for recessed items.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2025.

D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

F. ASTM C1036 - Standard Specification for Flat Glass; 2025.

G. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. Bobrick Washroom Equipment, Inc.; www.bobrick.com
   2. Substitutions: Section 01 60 00 - Product Requirements.

B. Provide products of each category type by single manufacturer.

C. See schedule, plans and elevations for quantities and locations.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.

B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

D. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.

E. Adhesive: Two component epoxy type, waterproof.

F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

E. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass; ASTM C1048.
   1. Size: As indicated on drawings. See Toilet Accessory Schedule
   2. Frame: 0.05 inchchannel shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
   3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
   4. Products:
      a. Bobrick: B-290 Series.
      b. Substitutions: Section 01 60 00 - Product Requirements.

B. Grab Bars: Stainless steel, textured surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
      c. Nonslip grasping surface finish and snap flange concealed fasteners.
      d. Length and Configuration: 36 inches, 18 inches, and 42 inches. See Toilet Accessories Schedule and elevations in Drawings.
      e. Products:

1) Bobrick B-6806 Series.
2) Substitutions: Section 01 60 00 - Product Requirements.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 0.05 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.

B. Shower Curtain: See drawings interior finish legend.

C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges and mechanical fasteners of Type 304 stainless steel, rectangular seat.
1. Seat: Phenolic or polymeric composite one-piece seat with slats, of color as selected.
2. Size: ADA Standards compliant.
3. Products:
a. Bobrick B-5181 (L shape), B-5193 (Rectangle).
b. Substitutions: Section 01 60 00 - Product Requirements.

D. Shelf: Stainless steel, 3/4 inch tall; angle brackets, screw attachment, satin finish.
1. Length: 24 inches.
2. Products:
a. Bobrick Stainless Steel Shelf; model B-295x24.
b. Substitutions: Section 01 60 00 - Product Requirements.

2.06 MISCELLANEOUS ACCESSORIES

A. Coat Hook: Heavy duty stainless steel; double-prong, vertical orientation with angular top hook and smaller angled lower hook; exposed flat head screw attachment, satin finish.
1. Equal to Bobrick B-6827, American Specialties, Inc. Model #7382-S.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

D. Verify installation of blocking, reinforcing plates, and concealed anchors in walls, and ceilings.

E. See Section 06 10 00 - Rough Carpentry for installation of blocking in walls and ceilings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
1. Mirrors: 40 inch, measured to bottom of mirrored surface.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

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SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. AED Station.

D. First Aid Station.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. ADAAG - Americans with Disabilities Act Accessibility Guidelines, 2010

B. FM (AG) - FM Approval Guide; Current Edition.

C. NFPA 10 - Standard for Portable Fire Extinguishers; 2026.

D. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features, extinguisher ratings and classifications, color and finish, and anchorage details.

C. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, and locations.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for factory finishes and extinguishers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Ansul, a Tyco Business: www.ansul.com.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com.
   3. Larsen's Manufacturing Co.: www.larsensmfg.com.
   4. Pyro-Chem, a Tyco Business: www.pyrochem.com.
   5. Strike First Corporation of America: www.strikefirstusa.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:
   1. **BASIS OF DESIGN:** JL Industries, Inc; Ambassador and Cosmopolitan Series: www.jlindustries.com.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com.
   3. Larsen's Manufacturing Co: www.larsensmfg.com.
   4. Potter-Roemer: www.potterroemer.com.
   5. Strike First Corporation of America: www.strikefirstusa.com.

6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Automated External defibrillator and Cabinet: Device; Owner Furnished, Contractor Installed (OFCI). Cabinet; Owner Furnished, Contractor Installed (OFCI).

D. First Aid Kit: Owner Furnished, Contractor Installed (OFCI).

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   1. Class: A:B:C type.
   2. Size: 10 pound.
   3. Finish: Baked polyester powder coat, RED color.

2.03 FIRE EXTINGUISHER CABINETS

A. Cabinet Construction: Non-fire rated.
   1. Formed primed steel sheet; 0.036 inch thick base metal.

B. Fire Rated Cabinet Construction: rating to match wall.
   1. Steel; double wall with 5/8 inch thick fire barrier material.

C. Cabinet Configuration: Recessed, semi-recessed and surface mount types.
   1. Application:
      a. CMU: Surface-mount.
      b. Gypsum Board: Semi-recessed and recessed, see plans for locations.
   2. Size to accommodate accessories.
   3. Tub nominal dimensions of 10-1/2 inch wide by 24 inch high by 6 inch deep.
   4. Projected Trim (semi-recessed): Returned to wall surface, with 1-1/2 inch projection, and 1-1/2 inch wide face.
   5. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.

D. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with tamper-resistant latch. Hinge doors for 180 degree opening with continuous piano hinge.

E. Door Glazing: Vertical style, Acrylic plastic, clear, 1/8 inch thick, flat shape and set in resilient channel glazing gasket.

F. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

G. Fabrication: Weld, fill, and grind components smooth.

H. Finish of Cabinet Exterior Trim and Door: Baked enamel, White color.

I. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

B. Cabinet Signage: Label “FIRE EXTINGUISHER” in colored letters, vertical on glass; Architect to select color of lettering from manufacturer's full range.

C. Provide and install one (1) angled tent sign at every fire protection specialty location. CONFIRM LOCATION OF ALL FLAGS WITH ARCHITECT PRIOR TO INSTALLATION.

2.05 KEY LOCK BOX

A. Box: Secure, UL listed box that houses entry keys and access cards; vandal-resistant, exterior grade.

1. Mounting: Recessed, coordinated with cladding system at location approved by Authority Having Jurisdiction (AHJ).
2. Size: 5 inches wide by 4 inches tall by 3 inches deep.
3. Capacity: 10 keys, access cards or entry items
4. Color: Cast aluminum equivalent finish.
5. Product: Equal to Knox-Box 3200 Series by Knox Company.

2.06 AUTOMATED EXTERNAL DEFIBRILLATOR (AED) STATION

A. AED Cabinet: Non-locking, factory finished steel "compact" cabinet with battery-powered built-in audible alarm and strobe light; on/off switch on alarm.
   1. Mounting: Fully-recessed; 3/8-inch trim.
   2. Quantity/Location: As indicated in life-safety plans, superceded by location preference from Owner, if offered.
   3. Finish: Factory enamel, WHITE interior and exterior.
   4. Features/Options: Strobe and Alarm; 3D sign, Window decal and Check Tag.
   5. Product: Activar (JL Industries) Model 1415 or equivalent from Allied Medical Products, Cardiac Science, HeartStation or Philips healthcare.

2.07 FIRST AID STATION

A. First Aid Cabinet: 4-shelf steel cabinet with swing-out door and vinyl inside-door liner for added storage space; unitized, WHITE with RED "First Aid" label.
   1. Complying with OSHA and ANSI Z308.1-201.
   2. Mounting: Surface mounted, not exceeding 4 inch projection.
   3. Quantity/Location: Within extents of storm shelter, as indicated in life-safety plans, superceded by location preference from Owner, if offered.
   4. Capacity (people served per kit): 150.
   5. Class: B+.
   6. Product: First Aid Only (brand) ANSI Industrial First Aid Kit or approved equal from American Red Cross, Honeywell North or Grainger Approved.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Locate extinguishers as indicated in code plan.

B. Install in accordance with manufacturer's instructions.

C. Install cabinets plumb and level in wall openings, 48 inches from finished floor to highest operable part.

D. Secure rigidly in place.

E. Place extinguishers in cabinets.

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SECTION 10 51 13
METAL LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lockers.

B. Locker benches.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base construction.

B. Section 06 10 00 - Rough Carpentry: Wood blocking and nailers.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's published data on locker construction, sizes, and accessories.

C. Shop Drawings: Indicate locker plan layout, numbering plan and combination lock code.

D. Samples: Submit two samples illistrating each color to be provided.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Lockers:
   1. Art Metal Products: www.artmetalproducts.com/#sle.
   2. Bradley Corporation: www.bradleycorp.com.
   3. List Industries, Inc: www.listindustries.com/#sle.
   4. Lockers MFG: www.lockersmfg.com/#sle.
   5. Basis of Design: Lyon Workspace Products: www.lyonworkspace.com/#sle.
   6. Olympus Lockers; www.olympuslockers.com.
   7. Penco Products, Inc: www.pencoproducts.com/#sle.
   8. Republic Storage Systems Co: www.republicstorage.com/#sle.
   9. Spacesaver Corporation.
   10. WEC Manufacturing: www.itswec.com/#sle.

2.02 LOCKER APPLICATIONS

A. Staff: Metal lockers, wall mounted with matching closed base.
   1. Width: 18 inches.
   2. Depth: 24 inches.
   3. Height: 72 inches. (76 inches with 4 inch base)
   4. Configuration: Single tier.
   5. Fittings: Size and configuration as indicated on drawings.
      a. Hat shelf.
      b. Hooks: Two double prong.
   6. Ventilation: Louvers at top and bottom of door panel.
   7. Locking: Padlock hasps, for padlocks provided by Owner.

8. Color: To be selected from manufacturer's full range by Design Professional.
9. Provide flat top.

2.03 METAL LOCKERS

A. Accessibility: Design units indicated on drawings as 'accessible' to comply with ICC A117.1 and ADA Standards.

B. Lockers: Factory assembled, made of formed sheet steel, {\rs\#1} SS Grade 33/230, with G60/Z180 coating, stretcher leveled; metal edges finished smooth without burrs; baked enamel finished inside and out.

C. Locker Body: Formed and flanged; with steel stiffener ribs; electric spot welded.
1. Body and Shelves: 16 gauge, 0.0598 inch.
2. Base: 16 gauge, 1.0598 inch.

D. Doors: Channel edge; welded construction, manufacturer's standard stiffeners, grind and finish edges smooth.
1. Door Thickness: 14 gauge, 0.0747 inch, minimum.
2. Form recess for operating handle and locking device.

E. Latches and Door Handles: Manufacturer's standard.

F. Hinges: Continuous piano hinge with powder coat finish to match locker color.

G. Coat Hooks: Stainless steel or zinc-plated steel.

H. Number Plates: Provide rectangular shaped aluminum plates. Form numbers 1 inch high of block font style with ADA designation, in contrasting color.

I. Locks: Locker manufacturer's standard type indicated in Applications article above.

2.04 LOCKER BENCHES

A. Locker Rooms Benches: Not in contract - Furniture Package.

B. Holding Cell Benches: Not in contract - Furniture Package.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases are in correct position and configuration.

B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Place and secure on prepared base.

C. Install lockers plumb and square.

D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 pounds.

E. Bolt adjoining locker units together to provide rigid installation.

F. Install end panels, filler panels, and sloped tops.

G. Install fittings if not factory installed.

H. Replace components that do not operate smoothly.

3.03 CLEANING

A. Clean locker interiors and exterior surfaces.

END OF SECTION

SECTION 12 24 00
WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades (WT#).

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 REFERENCE STANDARDS

A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

C. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

D. Selection Samples: Include fabric samples in full range of available colors and patterns.

E. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

F. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

G. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of this type.
   1. Manufacturer's authorized representative.

1.06 MOCK-UP

A. Mock-Up: Provide full size mock-up of window shade system complete with selected shade fabric including example of seams and batten pockets when applicable.
   1. Approved full-sized mock-up may become part of the final installation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

A. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: 25 years.
   2. Fabric: 25 years.
   3. Aluminum and Steel Coatings: 5 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Manually Operated Roller Shades:
   1. Draper, Inc: www.draperinc.com/#sle.
   2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
   3. Basis-of-Design: MechoShade Systems LLC; UrbanShade Single Roller - Manual: www.mechoshade.com/#sle.
   4. SWFcontract, a division of Springs Window Fashions, LLC.: www.swfcontract.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ROLLER SHADES

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Roller Shades:
   1. Description - Interior Roller Shades: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
      a. Drop Position: Regular roll.
      b. Roll Direction: Roll down, closed position is at window sill.
      c. Mounting: Window jamb mounted - inside, between jambs. Field verify all existing conditions.
      d. Size: As indicated on drawings.
      e. Fabric: As indicated under Shade Fabric article.
   2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
   3. Roller Tubes: As required for type of shade operation.
      a. Material: Extruded aluminum, clear anodized finish.
      b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
      c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
   4. Hembars: Designed to maintain bottom of shade straight and flat.
      a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
   5. Manual Operation for Interior Shades:
      a. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
      b. Drive Chain: Continuous loop beaded ball chain, 95 lb minimum breaking strength. Provide upper and lower limit stops.
      c. Chain Retainer:
         1) Chain tensioning device complying with WCMA A100.1.
         2) Manufacturer's standard clip.
   6. Accessories:
      a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; baked enamel finish.

2.03 SHADE FABRIC

A. Fabric: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
   1. Manufacturers:
      a. Basis-of-Design: MechoShade Systems LLC: www.mechoshade.com/#sle.
      b. Other fabric manufacturers: As acceptable to roller shade manufacturer.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Performance Requirements:
      a. Flammability: Pass NFPA 701 large and small tests.
      b. Fungal Resistance: No growth when tested according to ASTM G21.
   3. Light-Filtering Fabric: 1 percent.
   4. Fabrication:
      a. Fabric Orientation: Railroaded, fabric is turned 90 degrees off the roll.
      b. If height of opening requires multiple panels of railroaded fabric, use battens at seams.
      c. Battens: Full width of shade, enclose in welded shade fabric pocket.

2.04 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
   1. Vertical Dimensions: Fill openings from head to sill with 1/8 inch space between bottom bar and window stool.
   2. Horizontal Dimensions - Inside Mounting: Provide symmetrical light gaps on both sides of shade not to exceed 3/4 inch total.

C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. If substrate preparation is the responsibility of another installer, notify Design Professional of unsatisfactory preparation before proceeding.

C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.

C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.05 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

C. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.06 PROTECTION

A. Protect installed products from subsequent construction operations.

END OF SECTION

SECTION 12 36 00
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops:
   1. Solid Surface (SSM#).
   2. Quartz (QZ#).

B. Wall-hung counters and vanity tops.

C. Sinks molded into countertops.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry; installation of concealed blocking.

B. Section 06 41 00 - Architectural Wood Casework.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026a.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

E. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.

D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

E. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items. (AWI inspections and certifications program is not included with this project - "built to" only).

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.

B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 1/2 inch, overall thickness as detailed
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Avonite Surfaces: www.avonitesurfaces.com.
         2) Basis-of-Design: Dupont; Corian: www.corian.com.
         3) Formica Corporation: www.formica.com.
         4) Livingstone.
         5) Wilsonart: www.wilsonart.com.
         6) Substitutions: See Section 01 60 00 - Product Requirements.
      b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      c. Sinks and Bowls: Integral castings; minimum 1/2 inch wall thickness.
         1) Color: Cameo White.
         2) Model: Equal to Model 7418 by Corian.
      d. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
      e. Color and Pattern: As indicated in Interior Finish Legend.
   3. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; Double eased edge profile.
   4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
      a. Solid surface countertops to have integral back splashes and side splashes installed in the field.
   5. Skirts: As indicated on drawings.

C. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Flat Sheet Thickness: 3/4 inch, minimum.
   2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Cambria Company LLC: www.cambriausa.com/#sle.
         2) Dal-Tile Corporation: www.daltile.com/#sle.
         3) Ceasarstone.
         4) Wilsonart: www.wilsonart.com/#sle.
         5) Substitutions: See Section 01 60 00 - Product Requirements.
      b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
      c. Finish on Exposed Surfaces: Polished.

d. Color and Pattern: As indicated in Interior Finish Schedule.

3. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; square edge, slightly eased at top.
4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high, slightly eased at top.

2.02 MATERIALS

A. Wood-Based Components:
   1. Wood fabricated from old growth timber is not permitted.

B. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Joint Sealant: Mildew-resistant silicone sealant, paintable, match adjacent surface..

E. Low-Profile Countertop Support Brackets: 1/8-inch thick steel countertop/shelf support bracket, with low profile vertical support arm and upper extension; packaged in pairs.
   1. Capacity: 1000 lbs per pair, minimum.
   2. Depth: as indicated in drawings or as appropriate for countertop depth.
   3. Width: 1-1/2 or 2 inches
   4. Finish: As selected by Architect from manufacturer's standard range.
   5. Fasteners: 3/8 inch-- 16 x 3 bolt, included with bracket.
   6. Product: A&M Hardware: Concealed or Hybrid Workstation Brackets; or approved equivalent.

F. Grommets: Standard 2-inch plastic grommets for cut-outs, in color as selected by Architect from manufacturer's full range.
   1. Furnish and install grommets to be field located by Owner or Architect.
   2. Provide 1 per every 4 feet or worksurface.
   3. Product: “EDP3” manufactured by Doug Mockett and Co, Inc; or approved equivalent.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

C. Solid Surfacing: Fabricate tops and wall panels up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings.

E. Any exposed surfaces under counter shall be painted.

F. Drip edges shall be used on all sides of patient room sinks.

G. Solid surface counters at workstations to have knife edge.

H. Solid surface countertops to have integral back splashes.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Design Professional of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

3.07 SCHEDULES

A. Integral Sink: Oval, extra large, single, accessible.
   1. ADA-compliant.
   2. Inside Bowl Dimensions: 16-3/8 inch L x 13 inch W x 5 inch D.
   3. Room Types: Toilets (lavatories).
   4. Product: Corian model 810P or equal.

END OF SECTION

PROJECT MANUAL FOR:

F.Y. 2026
New City Hall - Police Headquarters

100 E 4th St.
Waterloo, IA 50703

City of Waterloo Contract No. 1154

VOLUME 2

Volume 1: Division 00 thru 12
Volume 2: Division 21 thru 32

August 26, 2026
Bid Documents

Prepared for:

City of Waterloo
715 Mulberry Street
Waterloo, Iowa 50703

Prepared by:
IMEG Corporation
INVISION Architecture
MODUS Engineering

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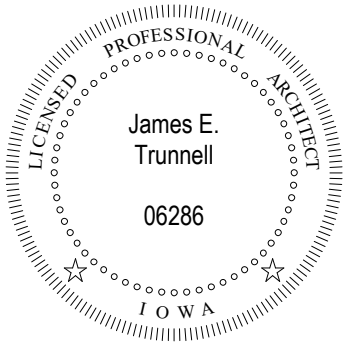

I hearby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed architect under the laws of the State of Iowa.

James E. Trunnell

Printed or typed name — Date

Signature

June 30, 2027

Registration expires

DIV 01-12, 31, 32 Unless specifically noted otherwise

Pages or sheets covered by this seal



I hearby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Michael P. Merron

Printed or typed name — Date

Signature

December 31, 2027

Registration expires

Sections: 031000, 032000, 033000, 034100, 042000, 051223, 052100
316329

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I hearby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Aaron J. Oltmann

Printed or typed name — Date

Signature

December 31, 2027

Registration expires

DIV 21, 22, 23

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I hearby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Steven F. Wagner
Printed or typed name — Date

Signature

December 31, 2027
Registration expires

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BASIC FIRE SUPPRESSION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Fire Suppression Requirements specifically applicable to Mechanical Division Specification Sections.

B. Division 21 Specification requirements also include, by reference, all Division 00 and 01 specification sections. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

1.02 OWNER OCCUPANCY

A. The owner will not occupy the premises during the construction period.

1.03 REGULATORY REQUIREMENTS

A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.

B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by the contractor, by the contractor's employees or through any operation under the contractor's charge, whether in the contract or as extra work.

C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.

D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve this contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.

E. All work shall comply with the applicable recommendations of:
   1. The National Board of Fire Underwriters
   2. The American Gas Association
   3. The National Fire Protection Association (NFPA)
   4. The Occupations Safety and Health Act (OSHA)
   5. Current IBC Building Code
   6. Current applicable city building codes
   7. Fire Protection: Conform to UFC and NFPA

F. Mechanical: Conform to current mechanical code.

G. Plumbing: Conform to current plumbing code.

H. Obtain permits and request inspections from authority having jurisdiction.

1.04 QUALIFICATIONS

A. The fire suppression installer must be a company specializing in applying the work of this division with a minimum of five years experience.

1.05 SYSTEM DESCRIPTION

A. Design and install the system to NFPA 13.

B. With the existing system, the contractor shall verify that the sprinkler system meets the currently enforced version of the NFPA. This contractor shall provide all work and devices required to bring the system in to compliance.

C. Remodel: The existing wet sprinkler system shall be modified as required for the new space occupancy. Modifications shall include, but not be limited to, number and location of sprinkler heads, type of heads, rerouting and resizing of branches, etc.

D. Remodel: The existing wet sprinkler system shall be extended to the remodeled space(s).

E. Addition: The existing wet sprinkler system shall be extended into the new addition. The sprinkler system in any remodeled spaces shall be modified as required.

1.06 PROJECT/SITE CONDITIONS

A. Install work in locations shown on the drawings unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer prior to proceeding.

C. This contractor, before submitting their bid, shall visit the site of the project to become familiar with locations and conditions affecting their work.

D. It is the intent of this specification that this contractor furnish all labor and material required to complete the installation as outlined in the drawings and specifications. No additions to the contract price shall be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing piping, ductwork, equipment, services and grades be noted on the job site prior to bid being submitted and that all elevations and grades be verified before roughing in new work.

F. This contractor shall provide holes as necessary for the installation of their work and in accordance with other specification sections in materials other than the structure.

1.07 SEQUENCING AND SCHEDULING

A. This contractor shall arrange their work in order that it progresses along with the general construction of the building.

B. This contractor shall be kept informed as to the work of other trades engaged in the project and shall execute their work in such a manner so as not to delay or interfere with progress of other contractors.

C. Where space for mechanical and electrical lines and piping is limited, it is imperative that all such trades coordinate their work so as to ensure concealment in space provided. Where conflict exists, the engineer shall decide priority of space. If work is not properly coordinated, the engineer may require removal and relocation of work without additional compensation.

1.08 GUARANTEE

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished, and labor installed under this contract for a period of one year after date of final acceptance, unless a longer period is specified.

B. Neither final certificate of payment nor any provisions in the contract documents nor partial or complete occupancy of premises by owner shall constitute an acceptance for work not done in accordance with contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

C. Should any defects arise as the result of defective workmanship or material within the guarantee period set forth, this contractor shall make the necessary correction at their own expense.

1.09 ENGINEER APPROVED EQUAL PRODUCTS

A. When the engineer, at the request of the interested parties, including the contractor, supplier and manufacturer approved "engineer approved equal" products for this project, such products are approved on the assumption that they will equal or exceed the performance of the products specified.

B. If such products do not do so after being installed on this project, this contractor shall replace or modify the particular product as necessary to equal the performance of the products specified at no expense to the owner, architect or engineer.

C. Request for "engineer approved equal" products shall be received by the architect/engineer prior to the last addendum being issued. Requests for substitutions received after this date will not be considered. Substitution requests shall clearly state which products are being considered for substitution. Substitution requests shall include all pertinent product information needed to evaluate the substitution as an "equal".

D. Similar products shall be all of the same manufacturers and style. There is no exception to this unless prior approval has been granted from engineer.

1.10 OWNER'S RIGHT OF SALVAGE

A. Before beginning construction, this contractor shall check and verify with the owner each item of existing equipment that must be removed.

B. The owner will designate which items of material or equipment not reused that they may wish to keep. This contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.

C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their own use shall become the property of the contractor and shall be removed from site.

1.11 PROTECTION AND MAINTENANCE

A. The work covered by these drawings and specifications involves all work in the existing building.

B. Where necessary to connect to any existing utility service, this contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.

C. Any work to be done in existing structures shall be coordinated with the owner and arrangements made so that traffic flow may be maintained and areas finished where possible before other areas are begun.

D. This contractor shall protect existing equipment in all finished areas from dirt, dust and damage as a result of their work.

E. Coordinate protection requirements with department heads before beginning construction.

F. Protect any building openings from unauthorized entry. Coordinate with owner where building entry must be controlled.

1.12 DEMOLITION

A. This contractor shall be responsible for the demolition and removal of all existing mechanical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.
   4. All elements to be removed are subject to the Owner's Right of Salvage.

B. Preserve services to the existing facility. Extend/reroute/reconnect existing systems as required providing for the continued function of these systems.

1.13 CUTTING AND PATCHING

A. This contractor shall do all cutting and patching necessary for the installation of their work in all existing and new buildings unless otherwise noted.

B. In areas where the integrity of new or existing fire separation assembly/wall is compromised by the work, contractor shall be responsible to patch and/or seal openings as necessary to maintain/return fire separation to rating as required by applicable codes.

C. This contractor shall do all cutting and patching required for their work beyond the remodeled areas unless otherwise noted. All finish work shall include patching to match existing adjacent surfaces. Painting shall be by others.

D. This contractor shall arrange for openings in the building as required for the installation of equipment furnished under this contract. Where piping must be extended or changed, patching with concrete will be done in the building. Patching shall be at both the top and bottom of sleeves where above grade.

1.14 CLEANING AND RUBBISH

A. This contractor shall upon completion of their work, remove all rubbish and debris resulting from this contractor's operation and shall remove it from site at their own expense.

B. In so far as this contractor's work is concerned, all equipment shall be cleaned and the premises left in first class condition.

C. This contractor shall maintain the work area each day to prevent hazardous accumulation of waste from their work.

1.15 SEALING AND PENETRATION

A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.

B. This contractor shall verify with the architect drawings the rating and location of all such construction and seal all penetrations.

C. Manufacturer offering products to comply with the requirements include the following:
   1. Dow Corning "Silicone RTV Foam"
   2. 3-M Corporation "Fire Barrier Caulk and Putty"
   3. Thomas & Betts "Flame Safe Fire Stop System"

D. Installation of these products to be in strict accordance with manufacturer's recommendations and architectural specification sections or equivalent fire stopping general specification section.

E. The contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.16 PENETRATION PROTECTION FOR ICC 500 STORM SHELTERS

A. This contractor shall provide two-point deflection protection for all penetrations through ICC 500 Storm Shelter envelopes. Penetrations through safe room envelopes larger than 3.5 square inches (rectangular) or 2.5” diameter (circular) shall have impact protection systems capable of resisting 250+ mph impacts per ICC 500 Section 306. Systems shall be 3rd party tested per ICC 500 Chapter 8.

B. Approved wall/roof shrouds:
   1. Manufacturers:
      a. Roof Penetration Housings (RPH) #CWS
      b. Engineer approved equal
   2. Description: Two-point deflection shroud with removable cover for roof or wall mounting to protect storm shelter envelope penetrations for ductwork, piping, conduit, cabling, etc.
   3. Sizing: Size per outside diameter of duct, piping, conduit, cable, etc (including insulation). Numerous penetrations may occur within a single shroud. Coordinate with other trades for bunched penetrations.
   4. Material: Steel, 3/16”, painted
   5. Testing: Shrouds shall be 3rd Party Tested to meet ICC-500 impact rating to 250+ mph. Testing shall be in accord with ICC 500 Chapter 8.

1.17 HAZARDOUS MATERIALS

A. If the contractor stores any hazardous solvents or other materials on the site, the contractor shall obtain copies of the safety data sheets for the materials and post them on the site. The contractor shall inform the owner and all employed of any potential exposure to this material.

B. At no time shall any product containing asbestos be incorporated into the work.
   1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.18 AS-BUILT DRAWINGS

A. This contractor shall provide, at the conclusion of the project, one clean, non-torn, neat, and legible "as-built" set of drawings to the owner. These drawings shall show the routing of pipes and equipment drawn in at scaled locations. All dimensions indicated shall be referenced to a column line. A set of construction drawings will be furnished for this work.

B. All sprinkler systems installed shall be shown on the "as-built" drawings.

C. Refer to respective general specification section for additional information.

D. This contractor shall update these drawings during the project at least every week.

1.19 REVIEW OF MATERIALS

A. This contractor shall submit to the engineer for review one (1) electronic copy of a brochure giving a complete list of materials and equipment they propose to furnish. The brochure shall contain complete information as to the make of equipment, type, size, capacities, dimensions and illustration. One of these returned copies shall be kept on the job at all times.

B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless the contractor notifies engineer in writing of such deviation at time such drawings are furnished.

C. All submittals shall have the date marked on them when the contractor receives them from the supplier. Submittals shall be submitted through the contractor and shall not come direct from the supplier to the architect or engineer.

D. This contractor shall mark the date and sign each set signifying that the contractor has checked each of them in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted, or checked and will be marked "resubmit" and sent back to the contractor.

1.20 TEST OF SYSTEMS

A. This contractor, before concealed, shall test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.

B. This contractor shall be held responsible for all damage resulting from defects in the system.

C. At the conclusion of construction (before any covering up, painting or finishing) each element of the system shall be thoroughly tested against leakage with appropriate pressure tests as outlined herein and in appropriate sections of the specifications. All testing shall be hydrostatic unless permission is granted otherwise.
   1. Underground Fire Lines: 200 psi. Maintain in accordance with NFPA 13.

D. Fluid lines other than the above shall be tested in accordance with NFPA 13.

E. After completion of installation, the systems shall be given tests under full operating conditions and pressures and all adjustments shall be made to make the system operative as required. All safety devices shall be tested for correct operation.

1.21 SCOPE OF WORK

A. All work shall be performed by well-qualified and licensed mechanics with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their mechanics are familiar with all the various codes and tests applicable to this work.

B. All equipment shall be new and of the type as specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

C. The intent of the drawings and specifications is for complete installation of the systems outlined in the drawings and specifications so that at the conclusion of construction the system will be turned over to the owner complete and ready for safe and efficient operation.

D. This contractor shall be required to furnish and install all such items normally included on systems of this type, which, while not mentioned directly herein or on the drawings are obviously essential to the installation and operation of the system and which are normally furnished on quality installation of this type. The drawings and specifications cannot deal individually with the many minute items that may be required by the nature of the systems.

E. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer’s attention and an addendum is issued for clarification.

F. The Fire Suppression Contractor shall establish system elevations prior to fabrication and installation. The Fire Suppression Contractor shall coordinate elevations with other trades. All elevations shall be coordinated with all trades in the field prior to installation. When a conflict between trades arises, the design team shall be notified immediately prior to further installation however priority shall be as follows:
   1. Lighting Fixtures
   2. Gravity flow piping, including steam and condensate.
   3. Electrical bus duct.
   4. Sheet metal.
   5. Cable trays, including access space.
   6. Other piping.
   7. Conduits and wireway.

1.22 VERIFICATION OF ELEVATION OF EXISTING LINES

A. This contractor, before starting any new work, shall verify the elevations of all existing piping to which they must connect under this contract. The contractor shall report any discrepancies between drawing elevations and actual elevations to the engineer before proceeding with the work. Failure of the contractor to do so shall make the contractor liable for the cost of extra work involved.

1.23 WELDING PERMIT

A. Form titled "Permit For Cutting and Welding With Portable, Gas or Arch Equipment" must be completed and returned to the hospitals designated representative prior to work commencing. The owner upon request will supply this form.

1.24 DAILY HOUSEKEEPING

A. At the end of each working day, this contractor shall remove all of their debris, rubbish, tools and surplus materials from the project work area. The work area shall be broom clean and left in a neat and orderly condition. This contractor, for the removal of debris from the project, shall not use the owner’s waste disposal facility.

B. At end of construction, all equipment shall be cleaned and the premises left in first class condition as far as this contractor's work is concerned.

1.25 CLEANING OF MECHANICAL SYSTEMS

A. This contractor shall clean all piping systems by flushing with water until free from all sand, grit, gravel, oil, etc.

B. Where connections are made to existing piping systems, this contractor shall provide isolation valves, threaded tees, etc., as required to facilitate the cleaning and testing of all new piping.

C. This contractor shall thoroughly clean all rust, grease, plaster, cement, etc., from all equipment and piping furnished and installed by them as required to leave surfaces suitable for finish painting.

D. This contractor shall keep all pipes, plugged, drained or otherwise protected during construction. All items of mechanical equipment shall be suitably protected and upon completion of project shall be equal to new condition.

1.26 TRENCHING AND BACKFILLING

A. Each contractor is responsible for their own individual trenching and backfilling unless otherwise noted in the drawings or addendum.

B. All underground utilities, piping, etc shall be located exactly before digging. This contractor shall be held responsible for all damages caused by failure to do so.

C. Any backfill shall be tamped and compacted to prevent future settling. The backfill shall be installed to a smooth and level grade and installed in accordance with local codes.

D. All excess dirt shall be cleared from the area and disposed of as directed by the owner.

E. Refer to architectural specification sections for additional requirements.

1.27 INFECTION CONTROL PROCEDURES

A. This contractor is instructed to adhere to the owner's procedures for infection control. Refer to owner's policy handbook for specifics.

B. This contractor is responsible for dust partitions outside of the construction areas.

C. This contractor shall schedule all work affecting the owner's use of areas outside of the construction area during evening hours.

1.28 ALTERNATES

A. Refer to General Specification Sections for alternate bid description.

1.29 DIGITAL MEDIA AGREEMENT

A. Computer Aided Drafting (CAD) documents may be available to the contractor for some uses. Contact the engineer prior to bidding to determine what information is available to be transmitted to the contractor in digital form.

B. When documents are determined to be available, and as requested by the contractor, they will be transmitted upon the completion and execution of the MODUS digital media agreement. A service fee for each document transmitted will be assessed to the contractor. Documents will be transmitted upon payment receipt. Current service fee is $100.00 per CAD sheet.

1.30 COMMISSIONING REQUIREMENTS

A. Contractor and their subcontractors and vendors shall assign representatives with expertise and authority to act on their behalf and schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
   1. Construction Phase:
      a. Facilitate the coordination of the commissioning and incorporate commissioning activities (the Commissioning Plan) into the Overall Project Schedule (OPS).
      b. Provide detailed startup procedures.
      c. Ensure that all subcontractors and vendors execute their commissioning responsibilities according to the contract documents and the OPS.

d. Provide copies of all submittals as required in Section 01300 including all changes thereto. Attend and participate in commissioning team meetings.
e. No later than 60 days prior to startup of the first piece of major equipment, meet with the CxA, CM, A/E, and PM and owner to finalize the detailed commissioning procedures/ schedule.
f. Provide the training of owner personnel.
g. Review and accept construction checklists provided by the commissioning authority.
h. Complete paper construction checklists as work is completed and provide to the commissioning agent.
i. Accomplish commissioning process test procedures.
j. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
k. Cooperate with the CxA for resolution of issues recorded in the “Issues Log”.
l. Prepare O & M manuals, according to the contract documents, including clarifying and updating the original sequences of operation to as-built/as-tested conditions.

2. Occupancy and Operations Phase
   a. Ensure that subcontractors provide assistance for seasonal or deferred performance testing, performed by the CxA, according to the specifications.
   b. Ensure that subcontractors correct deficiencies and make necessary adjustments to O & M manuals and as-built drawings for applicable issues identified in any seasonal testing.
   c. Perform all guarantee work for materials furnished under the contract for the time specified in the contract, including all warranties and curing all latent defects within the time period provided in the contract.

B. Vendors / Subcontractors
1. Provide all requested submittal data, including detailed startup procedures and specific responsibilities of the owner to keep warranties in force.
2. Assist in equipment testing per agreements with subcontractors and/or contractor.
3. Include cost of all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing, operating, and maintaining equipment according to these contract documents in the base bid price to the contractor.
4. Analyze specified products and verify that the A/E has specified the newest, most current equipment reasonable for this project's scope and budget.
5. Provide requested information regarding equipment sequence of operation and testing procedures.
6. Review construction checklists and test procedures for equipment installed by factory representatives.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 21 00 90
MINOR FIRE PROTECTION DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements of the Contract Forms, the Conditions of the Contract, Division 1 - General Requirements and Specification Section 21 00 50 - Basic Mechanical Requirements "General Provisions" apply to this section.

1.02 SCOPE

A. This contractor shall be responsible for the demolition and removal of all existing fire sprinkler elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.

B. Preserve services to the existing facility. Extend, reroute, and reconnect existing systems as required providing for the continued function of these systems.

C. This contractor shall be responsible for the cutting and capping of all existing sprinkler lines to be abandoned or changed.

D. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

E. This contractor shall remove all abandoned equipment, piping, ductwork, supports, equipment curbs, and bases associated with the remodeled areas unless noted otherwise.

F. This contractor is responsible to provide temporary fire protection during the project

1.03 MATERIALS

A. All elements to be removed are subject to the Owner's Right of Salvage.

B. All materials removed shall be the property of the removing contractor and shall be removed from the site by that contractor, unless otherwise specified.

C. The owner may designate and have salvage rights to any material herein demolished by this contractor. It will be the owner's responsibility to designate such salvageable items and remove them prior to the contractor working in that area.

1.04 WORK BY OTHERS

A. Unless specifically noted under other contracts, this mechanical contractor shall assume they will perform all required work. In general, the following will be performed by others:
   1. The electrical contractor will disconnect all electrical service and remove conduit back to behind finished surfaces, close and cap ends of conduits.

1.05 EXISTING CONDITIONS

A. If any piping serving existing fixtures or equipment (that are to remain) are disturbed by operations under this contract, this contractor shall provide pipe required to re-establish continuity of such piping systems.

B. This contractor shall arrange for the general contractor to repair and patch all construction with material necessary to match surrounding due to the removal of equipment, piping, and ductwork.

C. This contractor shall furnish all required labor and material, where required, to extend new work to connect to similar work for extension of existing systems.

D. Demolition information listed on the drawings are based on casual field observation and existing record documents. Report discrepancies to the owner before disturbing existing installation. Beginning of demolition means installer accepts existing conditions.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 21 05 29
HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe hangers and supports

B. Accessories

C. Sleeves

1.02 REFERENCES

A. ASME B31.1 - Power Piping

B. ASME B31.9 - Building Services Piping

C. ASTM F708 - Design and Installation of Rigid Pipe Hangers

D. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer

E. MSS SP69 - Pipe Hangers and Supports - Selection and Application

F. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices

G. NFPA 13 - Installation of Sprinkler Systems

H. NFPA 14 - Installation of Standpipe and Hose Systems

I. UL 203 - Pipe Hanger Equipment for Fire Protection Service

1.03 SUBMITTALS

A. Product Data: Provide manufacturers catalog data including load capacity.

B. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.

C. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable code for support of piping.

B. Supports for Sprinkler Piping: In conformance with NFPA 13.

C. Supports for Standpipes: In conformance with NFPA 14.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Manufacturers:
   1. Grinnell
   2. Tolco
   3. Engineer approved equal.

B. Fire Protection Piping:
   1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inch: Carbon steel, adjustable swivel, split ring.
   2. Hangers for Pipe Sizes Two Inch (2") and Over: Carbon steel, adjustable, clevis.
   3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
   4. Wall Support for Pipe Sizes to Three Inches: Cast iron hook.
   5. Wall Support for Pipe Sizes Four Inch (4") and Over: Welded steel bracket and wrought steel clamp.
   6. Vertical Support: Steel riser clamp.
   7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

8. Provide zinc coated hangers and supports for all non air conditioned areas.

2.02 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded one end or continuous threaded.

B. Install in accordance with manufacturer's instructions.

2.03 SLEEVES

A. Sleeves for pipes through wall below grade shall be Schedule 40, two pipe diameters larger than pipe. Seal with Linkseal.

B. Sleeves for pipes through non-fire rated floors shall be 18 gauge galvanized steel.

C. Sleeves for pipes through non-fire rated beams, walls, footings, and potentially wet floors shall be Schedule 40 steel pipe or 18 gauge galvanized steel.

D. Sleeves for pipes through fire rated and fire resistive floors and walls, and fire proofing to be a fire rated sleeve assembly including seals, UL listed.

E. Stuffing and Firestopping Insulation: Fiberglass type, non-combustible per UL tested assembly type.

F. Sealant Manufacturers:
   1. Dow Corning Silicone RTV Foam.
   2. 3-M Fire Barrier Caulk and Putty.
   3. Thomas & Betts Flame Safe Fire Stop System.
   4. Engineer approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.02 PIPE HANGERS AND SUPPORTS

A. Provide hanger rod size and spacing in accordance to NFPA requirements.

B. Support piping in accordance to NFPA requirements.

C. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

D. Place hangers within 12 inch of each horizontal elbow.

E. Use hangers with 1-1/2 inch minimum vertical adjustment.

F. Support vertical piping at every floor.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Each pipe section shall have at least one hanger.

I. Hangers shall not be spaced closer than 3" from an upright sprinkler head.

J. Unsupported arm over shall not exceed 24" for steel pipe or 12" for copper tube. For static/flow pressures exceeding 100 PSIg, the maximum length is reduced to 12" for steel pipe and 6" for copper tube.

K. Unsupported pipe lengths - The maximum unsupported length between the end sprinkler and the last hanger in the line shall comply with the table below.

PIPE MATERIAL	PIPE SIZE	MAXIMUM UNSUPPORTED LENGTH
Steel	1"	36"
	1-1/4"	48"
	1-1/2" and larger	60"
Steel (greater than 100 PSIg)	all sizes	12"
		18"
		24"
Copper	1"	18"
	1-1/4"	24"
	1-1/2" and larger	30"
Copper (greater than 100 PSIg)	all sizes	6"

L. Restrain sprinkler piping to prevent upward motion for pressures exceeding 100 PSIg.

M. Support riser piping independently of connected horizontal piping.

N. Design hangers for pipe movement without disengagement of supported pipe.

O. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.03 SLEEVES

A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

B. Size sleeves large enough to allow for movement due to expansion and contraction.

C. Extend sleeves through floor one inch (1") above finished floor level. Caulk sleeves.

D. Provide sleeves where piping penetrates floor, ceiling or wall fire rated assemblies. Close off space between pipe or duct and adjacent work with fire stopping insulation and caulk.

E. Provide close fitting metal collar or escutcheon covers at both sides of penetration. Install chrome plated steel escutcheons at finished surfaces and within cabinets.

END OF SECTION

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SECTION 21 12 00
FIRE SUPPRESSION PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wet sprinkler and standpipe piping

B. Standpipe piping (above ground)

C. Ball valves

D. Butterfly valves

1.02 RELATED SECTIONS

A. Specification Section 21 1300 - Fire Suppression Sprinkler Systems

1.03 REFERENCES

A. ANSI/ASME B16.3 - Malleable Iron Threaded Fittings, Class 150 and 300

B. ANSI/ASME B16.4 - Cast Iron Threaded Fittings, Class 125 and 250

C. ANSI/ASME B16.9 - Factory-Made Wrought Steel Butt Welding Fittings

D. ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

E. ANSI/ASME Sec 9 - Welding and Brazing Qualifications

F. ANSI/ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

G. ANSI/ASTM A135 - Electric Resistance Welded Steel Pipe

H. ASTM A795 - Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use

I. ASTM B88 - Seamless Copper Water Tube

J. ASTM D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

K. ASTM F437 - Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80

L. ASTM F438 - Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40

M. ASTM F439 - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80

N. ASTM F442 - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)

O. ASTM F493 - Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings

P. AWS A5.8 - Specifications for Filler Metal for Brazing and Braze Welding

Q. NFPA 13 - Installation of Sprinkler Systems

R. NFPA 13R - Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories of Height

S. NFPA 14 - Standpipe and Hose Systems

T. NFPA 24 - Installation of Private Fire Service Mains and their Appurtenances

1.04 SUBMITTALS

A. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor, and wall penetration seals.

B. Product Data: Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 OPERATION AND MAINTENANCE

A. Maintenance Instructions: Include installation instructions, spare parts list, procedures and treatment programs.

1.06 QUALITY ASSURANCE

A. Standpipe and Hose System: Perform to NFPA 14.

B. Welding Materials and Procedures: Perform to ASME Code.

C. Valves: Bear UL and FM label or marking. Provide manufacturer's name and pressure rating marked on valve body.

D. Maintain one copy of each document on site.

1.07 DELIVERY, STORAGE AND PROTECTION

A. Deliver, store, protect and handle products to site.

B. Deliver and store valves in shipping containers with labeling in place.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 PRODUCTS

2.01 WET SPRINKLER AND STANDPIPE PIPING (ABOVE GROUND)

A. Steel Pipe:
   1. Two Inch (2") and Smaller: ASTM A135/A53, Schedule 40 black mill steel.
   2. 2-1/2" to 6" - ASTM A153/A53, Schedule 10, black mill steel. Roll grooved,
   3. 8" and Larger - ASTM A135/A53, Black mill steel. Roll grooved,
   4. Fittings:
      a. Steel Pipe 2 Inch and Smaller: ANSI/ASME B16.4 cast iron or ANSI/ASME B16.3 malleable iron, threaded.
      b. Steel Pipe 2-1/2 Inch and Larger: Mechanical grooved couplings, ductile iron housing clamps, lock "C" shaped composition gasket, steel bolts, nuts, and washers.
      c. Coupling and fittings shall be made by the same manufacturer.
      d. Note: Plain end fittings and couplings are not allowed.
      e. Field welding of sprinkler pipe or fittings shall not be acceptable per NFPA 13.

2.02 STANDPIPE PIPING (ABOVE GROUND)

A. Galvanized Steel Pipe
   1. 1" - 2": ASTM A53/A795 Schedule 40, Hot Dipped Galvanized Steel, Threaded.
   2. 2 1/2"-6": ASTM A53/A795, Schedule 10, Hot Dipped Galvanized Steel, Roll Grooved
   3. 8" and Larger: ASTM A153/A53, Black Mill Steel. Roll Grooved.
   4. Fittings:
      a. 1"-2" ASTM A 126 Class A Gray Iron
      b. 2-1/2"-6": ASTM A536 ductile iron housing clamps, ASTM a 153 hot dipped galvanized, pre-lubricated grade “e” EPDM, type “a” gasket, steel bolts, nuts and washers. Mechanical grooved couplings. Ul listed and FM approved.
      c. Coupling and fittings shall be made by the same manufacturer.

2.03 BALL VALVES

A. Manufacturers:
   1. NIBCO
   2. Apollo
   3. Engineer approved equal.

B. Up To and Including 2 Inches: Bronze two piece body, chrome plated brass ball, Teflon seats and stuffing box ring, lever handle, threaded ends, full port on 1” and smaller, standard port above 1”.

C. UL listed and FM approved for fire protection service.

2.04 BUTTERFLY VALVES

A. Manufacturers:
   1. Victaulic
   2. Tyco
   3. NIBCO
   4. Milwaukee
   5. Engineer approved equal.

B. Two Inch (2") and Smaller: Bronze one piece body, full port, stainless steel disc, EPDM seat, threaded ends, hand wheel and gear drive with integral indicating device, and built-in tamper proof switch rated 10 amp at 115 volt AC.

C. Over 2 Inches: Ductile iron body, nickel plated ductile iron disc, resilient replaceable EPDM seat, groove ends, extended neck, hand wheel and gear drive and integral indicating device, and built-in tamper proof switch rated 10 amp at 115 volt AC.

D. UL listed and FM approved for fire protection service.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends, remove burrs, bevel plain end ferrous pipe.

B. Remove scale and foreign material, from inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. See plumbing specifications for underground piping requirements.

B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

C. Install piping to conserve building space and to not interfere with use of space and other work.

D. Group piping whenever practical at common elevations.

E. Sleeve pipes passing through partitions, walls, and floors.

F. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.

G. Prepare pipe, fittings, supports and accessories for finish painting. Where pipe support members are welded to structural building frame, scrape, brush clean and apply one coat of zinc rich primer to welding.

H. Do not penetrate building structural members unless indicated.

I. Provide sleeves when penetrating footings, floors and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.

J. Die cut screw joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.

K. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.

L. Provide butterfly valves for shut-off or isolating service.

M. Provide drain valves at main shut-off valves, low points of piping and apparatus.

N. Run drain piping to suitable drainage point, interior to the building. Coordinate all locations with architect.

O. Route piping concealed above ceiling. Where piping has to be exposed, coordinate all pipe routing with the architect.

END OF SECTION

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SECTION 21 13 00
FIRE SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sprinkler heads

B. Piping specialties

C. Double-Interlock Fire Protection Systems

1.02 RELATED SECTIONS

A. Specification Section 21 12 00 - Fire Suppression Piping

1.03 REFERENCES

A. ASTM F2503 - Standard Practice for Marking Medical Devices and Other Items for Safety in the Magnetic Resonance Environment

B. NFPA 13 - Installation of Sprinkler Systems

C. NFPA 15 - Water Spray Fixed Systems for Fire Protection

D. NFPA 231 - Standard for General Storage

E. NFPA 231C - Standard for Rack Storage of Materials

F. FM - Factory Mutual Approval Guide

G. NFPA 70 - National Electrical Code

H. UL - Fire Resistance Directory

I. UL 199 - Automatic Sprinklers

J. Warnock Hersey - Certification Listings

1.04 SYSTEM DESCRIPTION

A. Provide system as specified in Section 21 0050.

B. Flow test data included in the contract documents is for bidding purposes only. The contractor shall complete a flow test to determine the available volume and associated pressure of the incoming water supply to the building's sprinkler system. The contractor shall utilize their test data to complete all design calculations as required per these specifications. The contractor's flow test data shall be submitted to the Architect/Engineer for informational purposes prior to submitting any other Division 21 submittals.

C. Interface system with building fire and smoke alarm system.

D. Provide fire department connections where required.

1.05 SUBMITTALS

A. Product Data: Provide manufacturers catalog data including load capacity.

B. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.

C. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.

1.06 PROJECT RECORD DOCUMENTS

A. Preliminary Shop Drawings: Prior to detailed submission, submit preliminary layout of finished ceiling areas indicating only head locations coordinated with ceiling installation.

B. Shop Drawings: Indicate hydraulic calculations, detailed pipe lay out, hangers and supports, components and accessories. Indicate system controls.

C. Product Data: Provide data on sprinklers, valves, and specialties including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

D. Submit shop drawings, product data and hydraulic calculations to the local fire marshal and owner's insurance underwriter for approval. Submit proof of approval to architect and engineer.

E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds code requirements.

1.07 AS BUILT DRAWINGS

A. Record actual locations of sprinkler heads and deviations of piping from the drawings. Indicate drain and test locations.

1.08 OPERATION AND MAINTENANCE DATA

A. Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers, availability and location of service depot.

1.09 QUALITY ASSURANCE

A. Perform work in accordance with the System Description in Section 21 0050 where applicable and pre-approved by State Fire Marshal.

B. Equipment and components shall bear UL and FM label or markings.

C. Maintain one copy of document on site.

1.10 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with a minimum of three years experience.

1.11 REGULATORY REQUIREMENTS

A. Hydraulic Calculations, Product Data and Shop Drawings:
   1. Bear stamp of approval of authority having jurisdiction.
   2. Submit to the State of Iowa and to the owner's insurance underwriter.

1.12 DELIVERY, STORAGE AND PROTECTION

A. Deliver, store, and protect products to site.

B. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.13 EXTRA MATERIALS

A. Provide extra sprinkler heads under provisions of NFPA 13.

B. Provide suitable wrenches for each head type.

C. Provide metal storage cabinet in location designated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Viking

B. Reliable

C. Tyco

D. Engineer approved equal.

2.02 SPRINKLER HEADS

A. Recessed Ceiling Type:
   1. Semi-recessed type with ceiling escutcheon plate.
   2. Head finish: Factory finish, white.
   3. Ceiling Plate Finish: Factory finish, white.

B. Concealed Ceiling Type:
   1. Concealed drop-down type with matching removable ceiling cover plate.
   2. Head finish: Brass.
      a. Ceiling Cover Plate Finish: Factory finish, white.

C. Exposed Area Type:
   1. Type: Standard upright type with guard.
   2. Finish: Brass
   3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

D. Side Wall Type:
   1. Type: Recessed horizontal sidewall type with matching screw on escutcheon plate.
   2. Head Finish: Enamel, color white.
   3. Escutcheon Plate Finish: Enamel, color white.
   4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

E. Institutional/Vandal Proof Ceiling Type:
   1. Manufacturers:
      a. Star #PH-2
      b. Engineer approved equal.
   2. Type: Institutional style with flat escutcheon for new installations, deep escutcheon for remodeled areas.
   3. Finish: Stainless steel.
   4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

F. Institutional/Vandal Proof Side Wall Type:
   1. Manufacturers:
      a. Star #PH-5
      b. Engineers approved equal.
   2. Type: Institutional style with escutcheon plate, retaining flange, and centering grommet.
   3. Finish: Stainless steel.
   4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

G. Guards: Finish to match sprinkler head, install where heads are subject to damage.

H. Early Suppression Fast Response Type (ESFR):
   1. Type #ESFR pendant with heavy discharge.
   2. Finish: Brass
   3. Fusible Link: Fast-response link design.

2.03 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate electrically operated alarms with pressure retard chamber and variable pressure trim.

B. Water Flow Switch: Vane type switch for mounting horizontal or vertical with two contacts rated 10 amp at 115 volt AC. Switch shall have adjustable time delay feature. Include wiring of flow switch to fire alarm panel.

C. Provide tamper switches on all valves.

2.04 DOUBLE-INTERLOCK FIRE PROTECTION SYSTEMS

A. Manufacturers:
   1. Tyco
   2. Viking
   3. Reliable
   4. Engineer approved equal

B. General: Tyco model #DV-5 supervised double-interlock pre-action system. System shall include all necessary components including, but not limited to, control panel, riser assembly,

trim kits, air compressor, air tank, fittings, gauges, releasing control panel, internal wiring, and back-up battery system.

C. Refer to plans and details for specific system requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.

B. Place pipe runs to minimize obstruction to other work.

C. Place piping in concealed spaces above finished ceilings.

D. Center heads in two directions in ceiling tile and provide piping offsets as required.

E. Apply masking tape or paper cover to protect concealed sprinkler heads. Neither cover plates nor sprinkler heads receive field paint finish.

F. Flush entire piping system of foreign matter.

G. Hydrostatically test entire system including piping from the post indicator valve to the building. All piping associated with the automatic fire sprinkler system shall be tested by the Division 21 contractor.

H. Require test be witnessed by authority having jurisdiction.

I. Adjust concealed head sprinkler plate snug to ceilings.

J. Install white painted sprinkler heads in all areas except as noted below:
   1. Install brass exposed heads in all areas that do not have ceiling systems.
   2. Install concealed sprinkler heads in all areas where noted on the drawings.

K. Provide dual action sprinkler solenoid valves tied into smoke detectors in areas where noted on drawings.

L. Provide reduced pressure principal valve assembly at sprinkler system water source connection, if required.

M. Install all zone flow switches as called for on the drawings or as required. Extend fire department test connections to above floor drain or building exterior as approved by the local inspector.

N. Coordinate all head locations with mechanical/electrical systems as well as architectural drawings.

O. A sprinkler head shall be put on both sides of a privacy curtain. The exception in NFPA 13 for mesh at the top of a curtain shall not be used.

P. Coordinate all exposed pipe routing and drain valve locations with architect prior to installation.

Q. Flexible sprinkler head connection hose length shall be selected as appropriate for distance from branch line to sprinkler head. Maintain manufacturer's requirements for minimum radius and maximum quantity of bends. Sprinkler hose and sprinkler head shall be properly clamped and secured. Installation shall satisfy manufacturer installation requirements, UL and FM requirements. Where the requirements differ, the more stringent requirement applies.

3.02 INTERFACE WITH OTHER PRODUCTS

A. Ensure required devices are installed and connected as required to fire alarm system.

END OF SECTION

SECTION 21 20 00
FIRE EXTINGUISHING SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and piping specialties

B. Storage cylinders

1.02 REFERENCES

A. ASME B16.3 - Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998

B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2005) (ANSI B16.18)

C. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2005)

D. ASME B31.1 - Power Piping; The American Society of Mechanical Engineers; 2004 (ANSI/ASME B31.1)

E. ASME B40.100 - Pressure Gauges and Gauge Attachments; The American Society of Mechanical Engineers; 2005

F. ASME (BPV VIII, 1) - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; The American Society of Mechanical Engineers; 2004

G. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2004

H. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless; 2005

I. ASTM A 106/A 106M - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service; 2004b

J. ASTM A 135 - Standard Specification for Electric-Resistance-Welded Steel Pipe; 2005

K. ASTM A 234/A 234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2005a

L. ASTM B 32 - Standard Specification for Solder Metal; 2004

M. ASTM B 88 - Standard Specification for Seamless Copper Water Tube; 2003

N. ASTM B 88M - Standard Specification for Seamless Copper Water Tube (Metric); 2005

O. AWS A5.8/A5.8M - Specifications for Filler Metal for Brazing and Braze Welding; American Welding Society; 2004 and errata

P. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2006

Q. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition

R. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition

S. NEMA ICS 6 - Industrial Control and Systems: Enclosures; National Electrical Manufacturers Association; 1993 (R2001)

T. NFPA 70 - National Electrical Code; National Fire Protection Association; 2005

U. NFPA 72 - National Fire Alarm Code; National Fire Protection Association; 2007

V. NFPA 2001 - Standard on Clean Agent Fire Extinguishing Systems; National Fire Protection Association; 2004

W. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition

X. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Underwriters Laboratories Inc.; 2005

Y. UL 404 - Gauges, Indicating Pressure, for Compressed Gas Service; Underwriters Laboratories Inc.; 2005

1.03 SYSTEM DESCRIPTION

A. Fire Protection System: Total flooding of hazard area with fire extinguishing agent, to extinguish fire, complying with NFPA 2001.

B. System is fixed installation with equipment designed and installed to provide fire-extinguishing capability for ceiling space of single room.

C. Locate extinguishing agent supply and backup supply in each hazard area.

D. Provide sufficient amount of fire extinguishing agent liquid to convert into fire extinguishing agent vapor. Consider the following when computing volume:
   1. Volume of hazard area.
   2. Specific volume of fire extinguishing agent vapor.
   3. Additional quantities of fire extinguishing agent required to compensate for openings, pipe losses, and nitrogen dilution.
   4. Forced ventilation, fan coast-down time, and damper actuation time.
   5. Mechanical smoke control system.
   6. Other special conditions affecting extinguishing efficiency.

E. Interface system with building fire alarm system.

F. Provide total flooding of fire extinguishing agent concentration by volume, in maximum 10 seconds, for period of 10 minutes with 10 percent allowance for room leakage.

1.04 SUBMITTALS

A. Product Data: To bear stamp of approval of authority having jurisdiction. Provide for each piece of equipment comprising the system including cylinders, manifolds, control panel, nozzles, detectors, alarm bells or horns, switches, and annunciators.

B. Shop Drawings: To bear stamp of approval of authority having jurisdiction. Indicate detailed layout of system, including piping and location of each component. Include control diagrams, wiring diagrams, and written sequence of operation.

C. Design Data: Submit design calculations bearing stamp of approval of authority having jurisdiction. Include calculations that verify system pressures, nozzle flow rate, orifice code numbers, piping pressure losses, component flow data, and pipe sizes.

D. Test Reports: Indicate successful completion of tests.

E. Certificates: Certify that products meet or exceed specified requirements.
   1. Manufacturer: Certify that system meets or exceeds specified requirements.
   2. Welders: Submit certificate indicating compliance with ASME Section IX.

F. Manufacturer's Instructions: Include recommended equipment installation and system components.

G. Project Record Documents: Record actual locations of components and equipment, equipment identification markings, conduit and piping routing details, and agent storage positions.

H. Operation and Maintenance Data:
   1. Include electrical schematic written description of system design, drawings illustrating control logic and equipment locations, and technical brochures describing equipment.
   2. Include list of recommended spare parts.
   3. Include checklists and procedures for emergency situations, trouble shooting techniques, abort functions, system control panel operation, trouble procedures, and safety requirements.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Conform to NFPA 2001 for system design, fabrication, and installation.

B. Conform to NFPA 70 and NFPA 72 code for electrical wiring and wiring devices.

C. Conform to UL requirements.

D. Design system under direct supervision of a Professional Engineer experienced in design of this Work and licensed at Design-Builder.

E. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

F. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

G. Products: Indicate manufacturer's name and pressure rating on valve body. Indicate manufacturer, type, and size, part number, orifice code or orifice diameter on discharge nozzles. Markings shall be standard and visible after installation.

H. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

I. Provide certification of inspection approval of fire protection system by authority having jurisdiction.

J. The contractor for the Clean Agent suppression system shall be a qualified fire suppression system contractor, regularly engaged in the installation of Clean Agent fire suppression systems. The contractor shall employ a special hazards technician certified at Level III with the National Institute for Certification in Engineering Technologies (N.I.C.E.T.).

K. AII pipe fitters and tradesmen shall be licensed to perform work on fire protection systems within the jurisdiction of the State of Iowa.

L. Clean Agent must be accepted by the United States Environmental Protection Agency (EPA) for use in occupied spaces and be listed as an acceptable alternative to Halon1301 on the EPA Significant New Applications Program (SNAP) list.

1.06 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Deliver and store equipment in shipping containers with labeling in place. Deliver fire extinguishing agent in approved containers.

1.08 MAINTENANCE SERVICE

A. Conduct inspections 6 months and 12 months from Date of Substantial Completion to verify proper operation of system and to check agent container weight and pressure. Include a thorough check of controls, detection and alarm systems.

B. Submit documents certifying satisfactory system conditions. Include manufacturer's certificate of acceptance of Inspector's qualifications.

1.09 EXTRA MATERIALS

A. Furnish two of each type of detector.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. 3M NOVEC 1230 CLEAN AGENT

B. Engineer approved equal.

2.02 APPROVED INSTALLERS

A. Iowa Fire Equipment Company

B. Contact: Russell T. Bennett

C. Phone: 515-265-8030

D. Fax: 515-265-7649

E. Engineer Approved Equal.

2.03 PIPE AND PIPING SPECIALTIES

A. Steel Pipe: ASTM A 53/A 53M or ASTM A 106 Schedule 40, or ASTM A 135 Schedule 10, galvanized as specified in ASTM A 53/A 53M.
   1. Fittings: ASME B16.3 malleable iron class 300 for sizes 2 inch and smaller, or ASTM A 234/A 234M, wrought steel welding type fittings.
   2. Joints: Threaded, AWS D1.1 welded, or grooved and shouldered pipe end couplings.

B. Copper Tube: ASTM B 88 (ASTM B 88M), Type M (C) drawn.
   1. Fittings: ASME B16.18 cast copper alloy or ASME B16.22 wrought copper.
   2. Joints: ASTM B 32, HB solder (95-5 Tin Antimony).

C. Pipe Hangers: ASME B31.1, UL approved for sprinkler systems, split clamp up to 2-1/2 inch size, riser clamps over 2-1/2 inch size, adequate to offset discharge thrust.

D. Escutcheons: Chrome plated pressed or stamped brass, one-piece or split pattern, minimum 2 inches larger than opening.

E. Gauges: ASME B40.100 3-1/2 inch diameter cast aluminum case, phosphor bronze bourdon tube, rotary brass movement, brass socket, front re-calibration adjustment, black figures on white background, 1 percent mid-scale accuracy, scale calibrated in psi.

2.04 STORAGE CYLINDERS

A. Cylinders: Standard model and size for ease of replacement and addition. Design, fabricate, certify, and stamp cylinders in accordance with ASME Section VIII.

B. Identification: Permanent plate, specifying agent, tare and gross weight, pounds of fire extinguishing agent, and pressurization level; installed so plate is visible and readable.

C. Safety Release: Equip cylinders with frangible disc safety device.

D. Fire Extinguishing Agent: FM-200.

E. Fire Extinguishing Agent: NOVEC 1230 or Equal

F. Cylinder Valves: Heavy duty forged brass, incorporating safety release pressure operated manual control, solenoid discharge valve, and pressure gage. Provide solenoid pilot valves for each cylinder or bank of cylinders.

G. Manifold: Provide for systems with more than one cylinder, with rack to secure each cylinder and check valves between each cylinder discharge and manifold.

H. Manual:
   1. Pull Station: Semi-flush housing fitted with single action control "pull down" lever which locks in position after releasing spring-loaded contact switch, for mounting on electrical outlet box.
   2. Labeling: Locate engraved label adjacent to each manual pull station, indicating area protected, and that actuation will cause discharge of fire extinguishing agent.
   3. System Abort Switch: Stainless steel plate with momentary contact push button, countdown timer, magnetic door holders manual release, for mounting on electrical outlet box.

I. Detectors:
   1. Photoelectric Detectors: NFPA 72, UL listed, adjustable sensitivity, with LED light source and photocell, activated by smoke, plug-in, twist-lock unit easily removed from base.

a. Amplifier-Switching Circuit and Indicator Lamp: Solid state, two-wire operating on detector line voltage. On alarm, unit shall lock and be reset at control panel.
b. Adjustment: Manual for normal or high sensitivity, with sensitivity setting visible and requiring no special tools.
c. Base Assembly: Twist-lock type with screw terminals, lamp to indicate alarm, security base lock, and relay contactor.

J. Discharge Nozzles:
1. Discharge: To provide required rates of discharge and coverage and to distribute extinguishing agent uniformly throughout protected area.
2. Construction: One piece chrome plated brass or aluminum nozzle with textured finish with female pipe thread integral on body. Direct discharge parallel to ceiling.
3. Identification: Permanently mark nozzles to show equivalent single orifice diameter.

K. Control Cabinet:
1. Approved as alarm and releasing device, with solid state internal circuitry enclosed in NEMA ICS 6, Type 1 cabinet.
2. Provide supervision to NFPA 72, Class A of following circuits for wire break or ground faults:
a. Zone detection loops.
b. Remote manual discharge stations.
c. Suppression system solenoid valves.
d. Power supply and circuit wiring and fuse.
e. Battery interconnecting wires and fuse.
f. Alarm in abort mode.
3. Equip panel with following standard features:
a. Visual and audible annunciation of trouble or alarm signals.
b. Panel reset switch.
c. Trouble alarm silence switch with ring back feature.
d. Single zone detection: cross zone (optional).
e. Battery test meter and switch.
f. Manual discharge switch.
g. Deadman abort switch.
h. Programmable timers for pre-discharge and discharge, 0 to 60 second cycle.
i. Isolated relay contactors for external alarm or equipment and ventilation shutdown.
j. Relay contactors for general trouble signal.
k. Relay contactor activated by detector zone board in alarm or trouble mode.
4. Provide nickel cadmium batteries and charger for continuous operation of detection, alarm, actuation and supervision functions for 24 hours. Provide automatic battery switch-over upon failure of primary power supply.
5. Conceal control switches and indicators, with exception of Power On, Master Trouble, Supervisory Trouble, Circuit 1 Alarm, Circuit 2 Alarm and Release Indicators. Provide the following annunciation.
a. Power On: Green.
b. System Trouble: Amber.
c. Battery Trouble: Amber.
d. Circuit 1 Trouble: Amber.
e. Circuit 2 Trouble: Amber.
f. Ground Fault: Amber.
g. Release trouble: Amber.
h. Alarm Circuit 1: Red.
i. Alarm Circuit 2: Red.
j. Agent Release: Red.
k. Alarm Silence: Amber.

l. Battery Polarity: Amber.
m. Abort Trouble: Amber.
n. Alarm Output Trouble: Amber.
o. Supervisory Trouble: Amber.

L. Miscellaneous Equipment:
1. Alarm Bells: 24 volts, with supervision of circuit wiring, of modular design, red baked enamel finish, with minimum sound level of 84 dba, for mounting on 4 inch electrical outlet box.
2. Alarm Horns: 24 volts, with supervision of circuit wiring, with minimum sound level of 90 dba at 10 feet, for mounting on 4 inch electrical outlet box.
3. Strobe Beacon: Manufacturer's standard design, 24 volts, with system identification on strobe lens.
4. Motorized Fire Dampers:

M. Operating Sequence:
1. Actuation of one detector in either zone circuit:
a. Illuminate zone indicator.
b. Energize alarm bell.
c. Shut down air-conditioning system and close dampers.
d. Close doors to area.
e. Signal building fire alarm system.
2. Actuation of second detector on second zone circuit:
a. Illuminate zone indicator.
b. Energize alarm horn.
c. Shut down power to protected equipment.
d. Actuate time delay for up to 30 seconds.
e. Release extinguishing agent into protected area.
f. If abort switch is engaged, delay release.
g. Upon abort switch disengagement release extinguishing agent unless system cleared and reset.
3. Discharge of Extinguishing Agent:
a. Sounds alarm bells and horns.
b. Operates strobes.
4. Temperature Detection:
a. Lower Temperature: Illuminate indicator and energize bell.
b. Higher Temperature: Shut down power to protected equipment.
5. High Temperature Detection: Close circuit to sprinkler pre-action valve.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that enclosing walls are continuous above ceilings and below raised floors to enable required concentration to be built up and maintained for required time to ensure fire is extinguished.

3.02 INSTALLATION

A. Install in accordance with NFPA 2001.

B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe. Remove scale and dirt on inside and outside before assembly. Blow out pipe before nozzles or discharge devices are installed.

C. Route piping in orderly manner, concealed, plumb and parallel to building structure, and maintain gradient. Install piping to conserve building space, and not interfere with use of space and other work.

D. Securely support piping in accordance with ASME B31.1 with allowance for fire extinguishing agent thrust forces, and thermal expansion and contraction.

E. Use grooved mechanical couplings and fasteners only in accessible locations. Roll groove piping only.

F. Install unions downstream of valves and at equipment or apparatus connections.

G. Prepare pipe, fittings, supports, and accessories for finish painting.

H. Identify in accordance with NFPA 2001 requirements. Place directional arrows and system labels wherever piping changes direction and minimum 20 feet on straight runs.

I. Identify in accordance with NFPA 2001 requirements. Place directional arrows and system labels wherever piping changes direction and minimum 20 feet on straight runs.

J. Secure cylinders as indicated on Drawings. Where manifolded, mount and support by rack as indicated. For each system provide same size cylinders containing equal amounts of liquid.

K. In rooms with suspended ceiling tiles, clip or retain tiles within 4 foot radius of the nozzles to prevent lifting during discharge.

L. Install wiring.

M. Make final connections between equipment and system wiring under direct supervision of factory trained representative of manufacturer.

N. Install engraved plastic instruction plate, detailing emergency procedures, at control panel and at each manual discharge and abort switch location. At control panel identify control logic units, contacts, and major circuits with permanent nameplates.

O. At hazard area walls pack space between pipe, pipe sleeve or surface penetration with mineral fiber with elastomer calk to depth of 1/2 inch. Provide escutcheons where exposed piping passes through walls, floors, and ceilings. Seal pipe penetrations of fire separations.

P. Locate discharge nozzle approximately 6 inches above or below ceiling 6 inches below raised floors. Avoid interference with other piping and equipment.

Q. Locate remote manual releases at one or more doors to protect area where indicated. Locate deadman abort switch adjacent.

R. Locate strobe units at all points of entrance to protected area.

S. Locate abort station at all points of exit from protected area.

3.03 INTERFACE WITH OTHER PRODUCTS

A. Provide interlock with automatic closing door releases.

B. Integrate system with pre-action sprinkler system. Refer to Section 21 13 00.

C. Provide interlock with motorized dampers.

D. Provide signal to building fire alarm system.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Architectural Specification Sections.

B. Test distribution piping and valving, prior to nozzle installation, to 50 psi air pressure test. Inspect joints using soap water solution or halide torch or lamp. Repair leaks and retest. Maintain test pressure for four hours.

C. Upon completion of installation provide final checkout inspection by factory trained representative of manufacturer to ascertain proper system operation. Leave system in a fully commissioned and automatic readiness state with circuitry energized and supervised.

D. Test circuits including automatic discharge, manual discharge, equipment shut-down, alarm devices, and storage container pressure. Test supervision of each circuit.

E. Check each ionization detector with a sensitivity meter, adjust. Record sensitivity, and include record in test report.

F. Submit original copies of tests, indicating that factory trained technical representatives of the manufacturer have inspected and tested systems and are satisfied with methods of installation, connections and operation.

G. Pressure test entire enclosure with test fan, pressurizing protected area both under positive and negative conditions. Confirm that leakage is within system design allowance.

3.05 MANUFACTURER'S FIELD SERVICES

A. Provide experienced manufacturer's field engineer to supervise installation and performance testing of the system.

3.06 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate that components, except cylinder discharge assembly, are functioning properly and in conjunction with controls system.

B. Submit integrated step-by-step test procedure for approval 30 days prior to start of demonstration.
   1. Arrange meeting prior to demonstration with representatives of Owner, Owner's underwriter, and the installer.
   2. Perform visual inspection and overall review of system installed.
   3. Place minimum of three UL-listed recording analyzers in space. Provide certification that testing devices have been checked by recognized testing authority within two weeks of date of demonstration.
   4. Certify that replacement charge can be provided within 24 hours of demonstration.

C. Discharge system using manual-release switch mounted on control panel. Run discharge test with compressed nitrogen at 360 psi. After discharge, check cylinders for complete pressure release.

D. After satisfactory completion of discharge test, fill cylinders with amount of fire extinguishing agent specified in design calculations.

3.07 SCHEDULE

A. Location of devices:
   1. Smoke Detector: One at ceiling, two below floor.
   2. Heat Detector: Two at ceiling.
   3. Abort Switch: Next to main entrance, left side.
   4. Manual Release: Next to main entrance, right side.
   5. Alarm Bell: Any suitable location.
   6. Alarm Horn: None required.

END OF SECTION

SECTION 22 00 50
BASIC PLUMBING REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Plumbing Requirements specifically applicable to Mechanical Division Specification Sections.

B. Division 22 Specification requirements also include, by reference, all Division 00 and 01 specification sections. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

1.02 OWNER OCCUPANCY

A. The owner will not occupy the premises during the construction period.

1.03 REGULATORY REQUIREMENTS

A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.

B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by themselves, by their employees or through any operation under their charge, whether in the contract or extra work.

C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.

D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve the contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.

E. All work shall comply with the applicable recommendations of:
   1. The National Board of Fire Underwriters
   2. The American Gas Association
   3. The National Fire Protection Association (NFPA)
   4. The Occupations Safety and Health Act (OSHA)
   5. Current IBC Building Code
   6. Current applicable city building codes

F. Mechanical: Conform to current mechanical code.

G. Plumbing: Conform to current plumbing code.

H. Obtain permits and request inspections from authority having jurisdiction.

I. Safe Drinking Water Act and Senate Bill S.3874: All products must meet the lead-free requirements of the SDWA and NSF/ANSI 372 certification.

1.04 PROJECT/SITE CONDITIONS

A. Install work in locations shown on the drawings unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer before proceeding.

C. This contractor, before submitting their bid, shall visit the site of the project to familiarize themselves with locations and conditions affecting their work.

D. It is the intent of this specification that the contractor furnishes all labor and material required completing the installation as outlined in the drawings and specifications. No additions to the contract price shall be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing piping, ductwork, equipment, services and grades be noted on the job site before bid is submitted and that all elevations and grades be verified before roughing in new work.

F. This contractor shall provide holes as necessary for the installation of their work and in accordance with other specification sections in materials other than the structure.

1.05 SEQUENCING AND SCHEDULING

A. This contractor shall arrange their work in order that it progresses along with the general construction of the building.

B. This contractor shall be kept informed as to the work of other trades engaged in the project and shall execute their work in such a manner so as not to delay or interfere with progress of other contractors.

C. Where space for mechanical and electrical lines and piping is limited, it is imperative that all such trades coordinate their work so as to ensure concealment in space provided. Where conflict exists, the engineer shall decide priority of space. If work is not properly coordinated, the engineer may require removal and relocation of work without additional compensation.

1.06 GUARANTEE

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished and labor installed under this contract for a period of one year after date of final acceptance, unless a longer period is specified.

B. Neither final certificate of payment nor any provisions in the contract documents nor partial or complete occupancy of premises by owner shall constitute an acceptance for work not done in accordance with contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

C. Should any defects arise as the result of defective workmanship or material within the guarantee period set forth, this contractor shall make the necessary correction at their own expense.

1.07 ENGINEER APPROVED EQUAL PRODUCTS

A. When the engineer, at the request of the interested parties, including the contractor, supplier and manufacturer approved "engineer approved equal" products for this project, such products are approved on the assumption that they will equal or exceed the performance of the products specified.

B. If such products do not do so after being installed on this project, this contractor shall replace or modify the particular product as necessary to equal the performance of the products specified at no expense to the owner, architect or engineer.

C. Request for "engineer approved equal" products shall be received by the architect/engineer prior to the last addendum being issued. Requests for substitutions received after this date will not be considered. Substitution requests shall clearly state which products are being considered for substitution. Substitution requests shall include all pertinent product information needed to evaluate the substitution as an "equal".

D. Similar products shall be all of the same manufacturers and style. There is no exception to this unless prior approval has been granted from engineer.

1.08 OWNER'S RIGHT OF SALVAGE

A. Before beginning construction, this contractor shall check and verify with the owner each item of existing equipment that must be removed.

B. The owner will designate which items of material or equipment not reused that they may wish to keep. This contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.

C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their use shall become the property of the contractor and shall be removed from site.

1.09 PROTECTION AND MAINTENANCE

A. Where necessary to connect to any existing utility service, this contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.

B. Any work to be done in existing structures shall be coordinated with the owner and arrangements made so that traffic flow may be maintained and areas finished where possible before other areas are begun.

C. This contractor shall protect existing equipment in finished areas from dirt, dust and damage as a result of their work.

D. Coordinate protection requirements with department heads before beginning construction.

E. Protect any building openings from unauthorized entry. Coordinate with owner where building entry must be controlled.

1.10 DEMOLITION

A. This contractor shall be responsible for the demolition and removal of all existing mechanical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.
   4. All elements to be removed are subject to the Owner's Right of Salvage.

B. Preserve services to the existing facility. Extend/reroute/reconnect existing systems as required providing for the continued function of these systems.

1.11 CUTTING AND PATCHING

A. This contractor shall do all cutting and patching necessary for the installation of their work in all existing and new buildings unless otherwise noted.

B. This contractor shall arrange for openings in the building as required for the installation of equipment furnished under this contract.

C. Where sewers must be extended or changed, patching with concrete will be done in the building. Patching shall be at both the top and bottom of sleeves where above grade.

D. In areas where the integrity of new or existing fire separation assembly/wall is compromised by the work, contractor shall be responsible to patch and/or seal openings as necessary to maintain/return fire separation to rating as required by applicable codes.

E. This contractor shall do all cutting and patching required for their work beyond the remodeled areas unless otherwise noted. All finish work shall include patching to match existing adjacent surfaces. Painting shall be by others.

1.12 CLEANING AND RUBBISH

A. The Contractor shall coordinate with the owner special cleaning requirements and acceptable routes for transporting building material and rubbish removal.

B. Hazardous waste shall not be disposed of using sanitary or storm drains, or owner’s waste disposal facilities. Hazardous waste shall be removed from the project site and lawfully disposed of at the contractor's expense.

C. Daily Requirements:
   1. The Contractor shall maintain the work area each day to prevent hazardous accumulation of waste from the work site.
   2. At the end of each working day, the contractor shall remove all their debris, rubbish, tools, and surplus materials from the project work area. The work area shall appear broom clean

and left in a neat and orderly condition. The contractor for the removal of debris from the project shall not use the owner's waste disposal facilities.

3. All equipment shall be cleaned, and the premises left in excellent condition, free of dirt, debris, dust, grease, oil.

D. End of Project Requirements:
   1. The Contractor, upon completion of their work, shall remove all rubbish and debris resulting from their operation and shall remove it from site at their own expense.
   2. At the end of construction, all equipment and surfaces in the project area shall be left in a clean condition. Except for protective coatings and surfaces, equipment shall be cleaned to be free of dirt, dust, debris, oil, and grease. Fingerprints, palmprints, and footprints shall be cleaned from visible surfaces. Equipment rooms shall have surfaces cleaned, floor shall be broom clean and mopped. Spaces that are to be occupied within the work area shall have all surfaces dusted, cleaned, and disinfected. Floors shall be vacuum cleaned and mopped (if applicable).

1.13 SEALING AND PENETRATION

A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.

B. This contractor shall verify rating and location of all such construction with the architectural drawings and seal all penetrations.

C. Manufacturer offering products to comply with the requirements include the following:
   1. Dow Corning "Silicone RTV Foam"
   2. 3-M Corporation "Fire Barrier Caulk and Putty"
   3. Thomas & Betts "Flame Safe Fire Stop System"

D. Installation of these products to be in strict accordance with manufacturer's recommendations and architectural specification sections or equivalent fire stopping architectural specification section.

E. This contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.14 PENETRATION PROTECTION FOR ICC 500 STORM SHELTERS

A. This contractor shall provide two-point deflection protection for all penetrations through ICC 500 Storm Shelter envelopes. Penetrations through safe room envelopes larger than 3.5 square inches (rectangular) or 2.5" diameter (circular) shall have impact protection systems capable of resisting 250+ mph impacts per ICC 500 Section 306. Systems shall be 3rd party tested per ICC 500 Chapter 8.

B. Approved wall/roof shrouds:
   1. Manufacturers:
      a. Roof Penetration Housings (RPH) #CWS
      b. Engineer approved equal
   2. Description: Two-point deflection shroud with removable cover for roof or wall mounting to protect storm shelter envelope penetrations for ductwork, piping, conduit, cabling, etc.
   3. Sizing: Size per outside diameter of duct, piping, conduit, cable, etc (including insulation). Numerous penetrations may occur within a single shroud. Coordinate with other trades for bunched penetrations.
   4. Material: Steel, 3/16", painted
   5. Testing: Shrouds shall be 3rd Party Tested to meet ICC-500 impact rating to 250+ mph. Testing shall be in accord with ICC 500 Chapter 8.

1.15 ELECTRICAL CONNECTIONS

A. This contractor shall turn over all magnetic starters, thermal protective switches and speed changing switches furnished under this contract for all motor driven equipment to the electrical

contractor who will install such starters and switches and wire them to their respective motors as a part of the electrical contract.

1.16 UTILITY COMPANY

A. Any fees by the utility company are to be billed directly to the owner.

B. The contractor is required to assist the owner in the preparation of all utility company rebate forms that deal with equipment furnished and/or installed as a part of this contractor.

1.17 HAZARDOUS MATERIALS

A. If the contractor stores any hazardous solvents or other materials on the site, they shall obtain copies of the safety data sheets for the materials and post them on the site. The contractor shall inform the owner and all employed of any potential exposure to this material.

B. At no time shall any product containing asbestos be incorporated into the work.
   1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.18 RECORD DRAWINGS

A. This contractor shall provide, at the conclusion of the project, one clean, non-torn, neat, and legible "as-built" set of drawings to the owner. These drawings shall show the routing of pipes, ductwork and equipment drawn in at scaled locations. All dimensions indicated shall be referenced to a column line. A set of construction blue prints will be furnished for this work.

B. All mechanical systems installed shall be shown on the "as-built" drawings.

C. Refer to respective architectural specification section for additional information.

D. This contractor shall update these drawings during the project at least every week.

1.19 REVIEW OF MATERIALS

A. This contractor shall submit to the engineer for review one (1) electronic copy of a brochure giving a complete list of materials and equipment they propose to furnish. The brochure shall contain complete information as to the make of equipment, type, size, capacities, dimensions and illustration. One of the returned copies shall be kept on the job at all times.

B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless the contractor notifies engineer in writing of such deviation at time such drawings are furnished.

C. All submittals shall have the date marked on them when the contractor receives them from the supplier. Submittals shall be submitted through the contractor and shall not come direct from the supplier to the architect or engineer.

D. This contractor shall mark the date and sign each set that they have checked each of them in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted, or checked and will be marked "resubmit" and sent back to the contractor.

1.20 SCOPE OF WORK

A. All work shall be performed by well-qualified and licensed mechanics with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their mechanics are familiar with all the various codes and tests applicable to this work.

B. All equipment shall be new and of the type as specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

C. The intent of the drawings and specifications is for complete installation of the systems outlined in the drawings and specifications so that at the conclusion of construction the system will be turned over to the owner complete and ready for safe and efficient operation.

D. This contractor shall be required to furnish and install all such items normally included on systems of this type, which, while not mentioned directly herein or on the drawings are obviously essential to the installation and operation of the system and which are normally furnished on quality installation of this type. The drawings and specifications cannot deal individually with the many minute items that may be required by the nature of the systems.

E. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer's attention and an addendum is issued for clarification.

F. The Plumbing Contractor shall establish system elevations prior to fabrication and installation. The Plumbing Contractor shall coordinate elevations with other trades. All elevations shall be coordinated with all trades in the field prior to installation. When a conflict between trades arises, the design team shall be notified immediately prior to further installation however priority shall be as follows:
   1. Lighting Fixtures
   2. Gravity flow piping, including steam and condensate.
   3. Electrical bus duct.
   4. Sheet metal.
   5. Cable trays, including access space.
   6. Other piping.
   7. Conduits and wireway.

1.21 VERIFICATION OF ELEVATION OF EXISTING LINES

A. This contractor, before starting any new work, shall verify the elevations of all existing piping to which they must connect under this contract. The contractor shall report any discrepancies between drawing elevations and actual elevations to the engineer before proceeding with the work. Failure of the contractor to do so shall make them liable for the cost of extra work involved.

1.22 WELDING PERMIT

A. Form titled "Permit For Cutting and Welding With Portable, Gas or Arch Equipment" must be completed and returned to the hospitals designated representative prior to work commencing. The owner upon request will supply this form.

1.23 CLEANING OF MECHANICAL SYSTEMS

A. The mechanical contractor shall clean and passivate all plumbing systems. Flush systems with water until free from all sand, grit, gravel, oil, etc. Provide Babcock/Wilcox Millipore and biological testing on the flush water. The flush will be considered a success when the water exiting the system contains less than 100 ppb of total suspended solids and less than 100 RLUs.

B. Where connections are made to existing piping systems, this contractor shall provide isolation valves, threaded tees, etc., as required to facilitate the cleaning and testing of all new piping.

C. This contractor shall thoroughly clean all rust, grease, plaster, cement, etc., from all equipment and piping furnished and installed by them as required to leave surfaces suitable for finish painting.

D. This contractor shall keep all pipes, traps, waste lines, ducts, etc., plugged, drained or otherwise protected during construction. All items of mechanical equipment shall be suitably protected and upon completion of project shall be equal to new condition.

1.24 TRENCHING AND BACKFILLING

A. Each contractor is responsible for their own individual trenching and backfilling unless otherwise noted in the drawings or addendum.

B. All underground utilities, piping, etc shall be located exactly before digging. This contractor shall be held responsible for all damages caused by failure to do so.

C. Any backfill shall be tamped and compacted to prevent future settling. The backfill shall be installed to a smooth and level grade and installed in accordance with local codes.

D. All excess dirt shall be cleared from the area and disposed of as directed by the owner.

E. Refer to architectural specification sections for additional requirements.

1.25 INFECTION CONTROL PROCEDURES

A. This contractor is instructed to adhere to the owner's procedures for infection control. Refer to owner's policy handbook for specifics.

B. This contractor is responsible for dust partitions outside of the construction areas.

C. This contractor shall schedule all work affecting the owner's use of areas outside of the construction area during evening hours.

1.26 ALTERNATES

A. Refer to General Specification Sections for alternate bid description.

1.27 DIGITAL MEDIA AGREEMENT

A. Computer Aided Drafting (CAD) documents may be available to the contractor for some uses. Contact the engineer prior to bidding to determine what information is available to be transmitted to the contractor in digital form.

B. When documents are determined to be available, and as requested by the contractor, they will be transmitted upon the completion and execution of the MODUS digital media agreement. A service fee for each document transmitted will be assessed to the contractor. Documents will be transmitted upon payment receipt. Current service fee is $100.00 per CAD sheet.

1.28 COMMISSIONING REQUIREMENTS

A. Contractor and their subcontractors and vendors shall assign representatives with expertise and authority to act on their behalf and schedule them to participate in and perform commissioning process activities including, but not limited to, the following:

1. Construction Phase:
    a. Facilitate the coordination of the commissioning and incorporate commissioning activities (the Commissioning Plan) into the Overall Project Schedule (OPS).
    b. Provide detailed startup procedures.
    c. Ensure that all subcontractors and vendors execute their commissioning responsibilities according to the contract documents and the OPS.
    d. Provide copies of all submittals as required in Section 01300 including all changes thereto. Attend and participate in commissioning team meetings.
    e. No later than 60 days prior to startup of the first piece of major equipment, meet with the CxA, CM, A/E, and PM and owner to finalize the detailed commissioning procedures/ schedule.
    f. Provide the training of owner personnel.
    g. Review and accept construction checklists provided by the commissioning authority.
    h. Complete paper construction checklists as work is completed and provide to the commissioning agent.
    i. Accomplish commissioning process test procedures.
    j. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
    k. Cooperate with the CxA for resolution of issues recorded in the “Issues Log”.
    l. Prepare O & M manuals, according to the contract documents, including clarifying and updating the original sequences of operation to as-built/as-tested conditions.
2. Occupancy and Operations Phase
    a. Ensure that subcontractors provide assistance for seasonal or deferred performance testing, performed by the CxA, according to the specifications.

b. Ensure that subcontractors correct deficiencies and make necessary adjustments to O & M manuals and as-built drawings for applicable issues identified in any seasonal testing.
c. Perform all guarantee work for materials furnished under the contract for the time specified in the contract, including all warranties and curing all latent defects within the time period provided in the contract.

B. Vendors / Subcontractors
1. Provide all requested submittal data, including detailed startup procedures and specific responsibilities of the owner to keep warranties in force.
2. Assist in equipment testing per agreements with subcontractors and/or contractor.
3. Include cost of all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing, operating, and maintaining equipment according to these contract documents in the base bid price to the contractor.
4. Analyze specified products and verify that the A/E has specified the newest, most current equipment reasonable for this project's scope and budget.
5. Provide requested information regarding equipment sequence of operation and testing procedures.
6. Review construction checklists and test procedures for equipment installed by factory representatives.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 22 00 90
MINOR PLUMBING DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements of the Contract Forms, the Conditions of the Contract, Division 1 - General Requirements and Specification Section 22 00 50 - Basic Mechanical Requirements "General Provisions" apply to this section.

1.02 SCOPE

A. This contractor shall be responsible for the demolition and removal of all existing mechanical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.

B. Preserve services to the existing facility. Extend, reroute, and reconnect existing systems as required providing for the continued function of these systems.

C. This contractor shall be responsible for the cutting and capping of all existing gas, water, sewer, and any other utility service.

D. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

E. This contractor shall remove all abandon equipment, piping, ductwork, supports, equipment curbs, and bases associated with the remodeled areas unless noted otherwise.

F. This contractor is responsible to provide temporary plumbing protection during this project.

1.03 MATERIALS

A. All elements to be removed are subject to the Owner's Right of Salvage.

B. All materials removed shall be the property of the removing contractor and shall be removed from the site by them, unless otherwise specified.

C. The owner may designate and have salvage rights to any material herein demolished by this contractor. The contractor shall coordinate with the owner prior to start of demolition.

1.04 WORK BY OTHERS

A. Unless specifically noted under other contracts, this mechanical contractor shall assume they will perform all required work. In general, the following will be performed by others:
   1. The electrical contractor will disconnect all electrical service and remove conduit back to behind finished surfaces, close and cap ends of conduits.

1.05 EXISTING CONDITIONS

A. If any piping serving existing fixtures or equipment (that are to remain) are disturbed by operations under this contract, this contractor shall provide pipe and insulation required to re-establish continuity of such piping systems.

B. This contractor shall arrange for the general contractor to repair and patch all construction with material necessary to match surrounding due to the removal of equipment, piping, and ductwork.

C. This contractor shall furnish all required labor and material, where required, to extend new work to connect to similar work for extension of existing systems.

D. Demolition drawings are based on casual field observation and existing record documents. Report discrepancies to the owner before disturbing existing installation. Beginning of demolition means installer accepts existing conditions.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 22 05 19
METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pressure gauges
B. Pressure gauge tappings
C. Stem type thermometers
D. Dial thermometers
E. Thermometer supports
F. Test plugs

1.02 REFERENCES

A. ASME B40.1 - Gauges - Pressure Indicating Dial Type - Elastic Element
B. ASME MFC-3M - Measurement of Fluid Flow in Pipes Using Orifice, Nozzle and Venturi
C. ASTM E1 - Standard Specification for ASTM Thermometers
D. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers
E. AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case
F. AWWA C701 - Cold-Water Meters - Turbine Type, for Customer Service
G. AWWA C702 - Cold-Water Meters - Compound Type
H. AWWA C703 - Cold-Water Meters - Fire-Service Type
I. AWWA C706 - Direct-Reading Remote-Registration Systems for Cold-Water Meters
J. AWWA C710 - Cold-Water Meters - Displacement Type, Plastic Main Case
K. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance
L. UL 393 - Indicating Pressure Gauges for Fire-Protection Service
M. UL 404 - Gauges, Indicating Pressure, for Compressed Gas Service
N. NSF/ANSI 61 - Drinking Water System Components - Health Effects
O. NSF/ANSI 372 - Drinking Water System Components - Lead Content

1.03 SUBMITTALS

A. All submitted documents shall be:
    1. Digital (scanned documents are not acceptable)
    2. Current, within last 5 years
    3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
    4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
    1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Product Data, indicating use, operating range, total range, accuracy, and location for manufactured components.
C. Closeout submittal
    1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Operation and Maintenance Information, including calibration instructions
D. Project Record Documents
    1. Final installed locations of all components on a PDF floor plan

1.04 ENVIRONMENTAL REQUIREMENTS

A. Do not install instruments when areas are under construction, except for required rough in, taps, support, and test plugs.

1.05 REGULATORY REQUIREMENTS

A. Wetted surfaces of brass and bronze components shall contain <0.25% weighted average lead content (lead free) as defined by NSF/ANSI Standards 61 and 372.

PART 2 PRODUCTS

2.01 PRESSURE GAUGES

A. Manufacturers:
   1. Ametek/US Gauge Series
   2. Trerice
   3. Miljoco - Weiss
   4. Weiss Instruments
   5. Dwyer
   6. Winters Instruments
   7. Engineer approved equal.

B. Gauge: Install where indicated on the drawings, 4.5 inch dial size pressure gauge, phenolic solid front pressure relieving case, Grade 1A, +/- 1% accuracy with range approximately twice working pressure.

C. All gauges to be fitted with gauge cocks.

2.02 PRESSURE GAUGE TAPPINGS

A. Needle Valve: Brass, 1/4 inch NPT for minimum 300 psi.

B. Ball Valve: Brass 1/4 inch NPT for 250 psi.

C. Pulsation Damper: Pressure snubber brass with 1/4 inch NPT connections.

D. Siphon: Steel, Schedule 40, 1/4 inch NPT angle or straight pattern.

2.03 STEM TYPE THERMOMETERS

A. Manufacturers:
   1. Miljoco-Weiss
   2. Trerice
   3. Engineer approved equal.

B. Thermometer: ASTM E1, blue organic-filled glass tube, lens front tube, cast aluminum case with enamel finish.

C. Size: Six inch (6") scale where less than six foot (6') above floor, nine inch (9") scale where higher than six inch (6") above floor.

D. Window: Polyester/glass mixture or acrylic.

E. Stem: Aluminum, 3/4 inch NPT, 3-1/2 inch

F. Accuracy: Two percent.

G. Range: Approximately 20% greater than expected operating temperature.

H. Calibration: Degree F.

I. Accessories: Manufacturer's 3-1/2 inch stem lead-free thermowell.

2.04 DIAL THERMOMETERS

A. Manufacturers:
   1. Miljoco-Weiss
   2. Trerice
   3. Winters Instruments.

4. Engineer approved equal.

B. Thermometer: ASTM E1, stainless steel case, bimetallic helix actuated with silicone fluid damping, white with black markings and black pointer hermetically sealed lens, stainless steel stem and variable angle face.

C. Size: Three inch diameter dial.

D. Lens: Clear glass.

E. Accuracy: One percent.

F. Range: Approximately 20% greater than expected operating temperature.

G. Calibration: Degree F.

H. Accessories: Manufacturer's lead-free thermowell.

2.05 THERMOMETER SUPPORTS

A. Socket: Brass separable sockets for thermometer stem with or without extensions as required.

2.06 TEST PLUGS

A. Test Plug: Brass 1/4 inch fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with neoprene core for temperatures up to 200 deg F.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install one pressure gauge per pump with taps before strainers and on suction and discharge of pump; pipe to gauge.

B. Install gauge taps in piping.

C. Install pressure gauges with pulsation dampers. Provide ball valve to isolate each gauge. Extend nipples and siphons to allow clearance from insulation.

D. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Ensure sockets allow clearance from insulation.

E. Coil and conceal excess capillary on remote element instruments.

F. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degree off vertical.

G. Adjust gauges and thermometers to final angle, clean windows and lenses, and calibrate to zero.

H. Locate test plugs adjacent thermometers and thermometer sockets adjacent to pressure gauges and pressure gauge taps.

I. Refer to schematics and details on drawings for additional locations.

3.02 SCHEDULES

A. See details on drawings.

END OF SECTION

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SECTION 22 05 29
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe hangers and supports
B. Accessories
C. Flashing
D. Equipment bases
E. Sleeves

1.02 RELATED SECTIONS

A. Specification Section 22 11 16 - Domestic Water Piping

1.03 REFERENCES

A. ASME B31.9 - Building Services Piping
B. ASTM F708 - Design and Installation of Rigid Pipe Hangers
C. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer
D. MSS SP69 - Pipe Hangers and Supports - Selection and Application
E. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices

1.04 SUBMITTALS

A. All submitted documents shall be:
    1. Digital (scanned documents are not acceptable)
    2. Current, within last 5 years
    3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
    4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
    1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Product Data
        b. Design Data, indicating load capacity of hangers

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for support of piping.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Manufacturers:
    1. Anvil International
    2. Tolco/Cooper B-Line
    3. Engineer approved equal.
B. Plumbing Piping - Drain, Waste and Vent:
    1. Conform to ASME B31.9; ASTM F708
    2. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inch: Carbon steel adjustable swivel, split ring.
    3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
    4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
    5. Wall Support for Pipe Sizes to 3 Inches: Cast iron bracket.

6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
7. Vertical Support: Steel riser clamp.
8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Copper Pipe Support: Carbon steel ring, adjustable, and copper plated.
10. Provide zinc coated hangers and supports for all non air conditioned areas.
11. Provide stainless steel hangers and supports in locker rooms and other high humidity area.
12. Provide zinc coated (hot dipped galvanized) hangers and supports for all exterior applications.

C. Plumbing Piping - Water:
1. Conform to ASME B31.9; ASTM F708.
2. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Carbon steel adjustable swivel, split ring. Anvil International Figure 104.
3. Hangers for Cold Pipe Sizes 2 Inch and Over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe Sizes 2 Inch to 4 Inch: Carbon steel, adjustable, clevis.
5. Hangers for Hot Pipe Sizes 6 Inch and Over: Adjustable steel yoke, cast iron roll, single hanger.
6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 Inches and Over: Steel channels with welded spacers and hanger rods, cast iron roll.
8. Wall Support for Pipe Sizes to 3 Inches: Cast iron bracket.
9. Wall Support for Pipe Sizes 4 Inches Over: Welded steel bracket and wrought steel clamp.
10. Wall Support for Hot Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
11. Vertical Support: Steel riser clamp.
12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
13. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
14. Floor Support for Hot Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
15. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
16. Provide zinc coated hangers and supports for all non air conditioned areas.
17. Provide stainless steel hangers and supports in locker rooms and other high humidity area.
18. Provide zinc coated (hot dipped galvanized) hangers and supports for all exterior applications.

2.02 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded one end or continuous threaded.

2.03 FLASHING

A. Metal Flashing: 26 gauge galvanized steel.

B. Metal Counter Flashing: 22 gauge galvanized steel.

C. Flexible Flashing: 47 mil thick sheet butyl compatible with roofing.

D. Caps: Steel, 22 gauge minimum; 16 gauge at fire resistant elements.

2.04 EQUIPMENT BASES

A. Provide housekeeping pads of concrete, minimum four inch (4") thick and extending six inches (6") beyond supported equipment.

2.05 SLEEVES

A. Sleeves for pipes through wall below grade shall be Schedule 40, two pipe diameters larger than pipe. Seal with Linkseal.

B. Sleeves for pipes through non-fire rated floors shall be 18 gauge galvanized steel.

C. Sleeves for pipes through non-fire rated beams, walls, footings, and potentially wet floors shall be Schedule 40 steel pipe or 18 gauge galvanized steel.

D. Sleeves for pipes through fire rated and fire resistive floors and walls, and fire proofing to be a fire rated sleeve assembly including seals, UL listed.

E. Stuffing and Firestopping Insulation: Fiberglass type, non-combustible per UL tested assembly type.

F. Sealant Manufacturers:
   1. Dow Corning Silicone RTV Foam.
   2. 3-M Fire Barrier Caulk and Putty.
   3. Thomas & Betts Flame Safe Fire Stop System.
   4. Engineer approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as scheduled.

B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

C. Place hangers within 12 inch of each horizontal elbow.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Support horizontal cast iron pipe adjacent to each hub with 5 foot maximum spacing between hangers.

F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. Provide copper plated hangers and supports for copper piping.

J. Design hangers for pipe movement without disengagement of supported pipe.

K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.03 EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum four inch (4") thick and extending six inches (6") beyond all floor supported equipment.

B. Provide templates, anchor bolts and accessories for mounting and anchoring equipment.

C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.04 FLASHING

A. Provide flexible flashing and metal counter flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Flash vent and soil pipes projecting three inch (3") minimum above finished roof surface with 24" x 24" sheet size. Turn flanges back into wall and caulk, metal counterflash, and seal for pipes through outside walls. Refer to architectural drawings and specifications for additional information.

C. Flash floor drains in floors with topping over finished areas with waterproof membrane ten inch (10") clear on sides with minimum 36" x 36" sheet size. Fasten flashing to drain clamp device.

D. Seal floor, shower, and mop sink drains watertight to adjacent materials.

E. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.05 SLEEVES

A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

C. Extend sleeves through floor one inch above finished floor level. Caulk sleeves.

D. Provide sleeves where piping penetrates floor, ceiling or wall fire rated assemblies. Close off space between pipe and adjacent work with fire stopping insulation and caulk.

E. Provide close fitting metal collar or escutcheon covers at both sides of penetration. Install chrome plated steel escutcheons at finished surfaces and within cabinets.

3.06 SCHEDULES

HANGER ROD PIPE SIZE	MAX. HANGER SPACING FEET	DIAMETER INCHES
1/2 to 1-1/4	6.5	3/8
1-1/2 to 2	10.0	3/8
2-1/2 to 3	10.0	1/2
4 to 6	10.0	5/8
8 to 12	14.0	7/8
14 and Over	20.0	1
PVC (all sizes)	6.0	3/8
C.I. Bell & Spigot (or No-Hub) and at Joints	5.0	5/8

END OF SECTION

SECTION 22 05 48
VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vibration isolation

1.02 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data, including schedule of isolator type with location and load
      b. Shop Drawings
      c. Installation Instructions
      d. Manufacturer's Certificate verifying proper installation

C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Operation and Maintenance Information

D. Project Record Documents
   1. Indicate final installed locations of all hangers on a PDF floor plan

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Kinetics

B. Mason Industries

C. Amber Booth

D. Engineer approved equal.

2.02 VIBRATION ISOLATORS

A. Open Spring:
   1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
   2. Code: Color code springs for load carrying capacity.
   3. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
   4. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads and zinc chromate plated hardware.
   5. Sound Pads: Size for minimum deflection of 0.05 inch meets requirements for neoprene pad isolators, type #6.
   6. Isolators: Mason Industries type #SLF.

B. Restrained Spring:
   1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.

2. Code: Color code springs for load carrying capacity.
3. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
4. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads and zinc chromate plated hardware.
5. Sound Pads: Size for minimum deflection of 0.05 inch meets requirements for neoprene pad isolators, type #6.
6. Restraint: Provide heavy mounting frame and limit stops.
7. Isolators: Mason Industries type #SLR.

C. Closed Spring:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
4. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
5. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, type #6 and neoprene side stabilizers with minimum 0.25 inch clearance.
6. Isolator: Mason Industries type #CSR.

D. Restrained Closed Spring:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
4. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
5. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, type #6 and neoprene side stabilizers with minimum 0.25 inch clearance and limit stops.
6. Isolator: Mason Industries type #CSR.

E. Spring Hanger:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection being 0.3 and 0.6 of maximum deflection.
4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators rubber hanger with threaded insert.
5. Misalignment: Capable of 20 degree hanger rod misalignment.
6. Isolator: Mason Industries type #30N.

F. Neoprene Pad Isolators:
1. Rubber or neoprene waffle pads.
   a. 30 durometer.
   b. Minimum 1/2 inch thick.
   c. Maximum loading 40 psi.
   d. Height of ribs shall not exceed 0.7 times width.
   e. Configuration: Single layer 1/2 inch thick waffle pads bonded each side of 1/4 inch thick steel plate.
   f. Isolator: Mason Industries type #W.

G. Rubber Mount or Hanger:
   1. Molded rubber designed for 0.5 inch deflection with threaded insert.
   2. Isolator: Mason Industries type #HD.

H. Thrust Restraint: Isolator shall be Mason Industries type #WBI or #WBD.

I. Fiberglass Pads: Neoprene jacketed pre-compressed molded fiberglass.

J. Seismic Snubbers:
   1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
   2. Neoprene Elements: Replaceable, min. of 0.75 inch thick.
   3. Capacity: Four times load assigned to mount groupings at 0.4 inch deflection.
   4. Attachment Points and Fasteners: Capable of withstanding three times rated load capacity of seismic snubber.
   5. Isolators: Mason Industries type #Z-1011.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install isolation for motor driven equipment.

C. Install spring hangers without binding.

D. Closed Spring Isolators: Adjust so side stabilizers are clear under normal operating conditions.

E. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.

F. Support piping connections to isolated equipment resiliently as follows:
   1. Diameter Up to 4 Inch: First three points of support.
   2. Diameter 5" to 8 Inch: First four points of support.
   3. Diameter 10" and Over: First six points of support.
   4. Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.

G. Connect wiring to isolated equipment with flexible hanging loop.

H. Housekeeping pads are by the mechanical contractor unless otherwise noted.

I. Pad mounted equipment deflection shall be .25 inches.

J. Refer to schedule and details on the drawings.

3.02 MANUFACTURER'S FIELD SERVICES

A. Inspect isolated equipment after installation and submit report. Include static deflections.

3.03 EQUIPMENT ISOLATION SCHEDULE

A. Refer to equipment schedules in specifications and/or on the drawings.

3.04 PIPE ISOLATION SCHEDULE

PIPE SIZES (INCHES)	ISOLATED DISTANCE FROM EQUIPMENT
1	120 diameters
2	90 diameters
3	80 diameters
4	75 diameters
6	60 diameters
8	60 diameters
10	54 diameters
12	50 diameters
16	45 diameters
24	38 diameters

END OF SECTION

SECTION 22 05 53
IDENTIFICATION FOR PLUMBING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates
B. Tags
C. Pipe markers
D. Ceiling markers
E. Labels
F. Schedule

1.02 REFERENCES

A. ASME A13.1 - Scheme for the Identification of Piping Systems
B. NFPA 99 - Standard for Health Care Facilities

1.03 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data, including a list of wording, symbols, letter size, and color-coding for mechanical identification.
C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
D. Project Record Documents
   1. Record actual locations of tagged valves, including valve tag numbers.

1.04 REGULATORY REQUIREMENTS

A. Conform to NFPA 99 requirements for labeling and identification of medical gas piping systems and accessories.

PART 2 PRODUCTS

2.01 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.02 TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

C. Information Tags: Clear plastic with printed "Danger, "Caution" or "Warning" and message; size 3-1/4" x 5-5/8" with grommet and self-locking nylon ties.

D. Tag Chart: Typewritten letter size list in anodized aluminum frame plastic laminated.

2.03 PIPE MARKERS

A. Color and Lettering: Conform to ASME A13.1.

B. Plastic Underground Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6" W x 4" mil thick, manufactured for direct burial service.

C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings indicating flow direction arrow and identification of fluid being conveyed.

D. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

2.04 CEILING MARKERS

A. Description: Acrylic, self adhesive marker with a 3/4 inch diameter color-coded head.

B. Color Code as Follows:
   1. HVAC Equipment: Yellow.
   2. Fire Dampers/Smoke Dampers: Red.
   3. Plumbing Valves: Green.
   4. Heating/Cooling Valves: Blue.

C. Coordinate with owner prior to installing.

2.05 LABELS

A. Description: Laminated Mylar, size 1.9" x 0.75" adhesive backed with printed identification.

PART 3 EXECUTION

3.01 PREPARATION

A. De-grease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

A. Install identifying devices after completion of coverings and painting.

B. Install plastic nameplates with corrosive-resistant mechanical fasteners or adhesive.

C. Install labels with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer. Apply paint primer before applying labels for unfinished canvas covering.

D. Install tags using corrosion resistant chain. Number tags consecutively by location.

E. Install underground plastic pipe markers six inch (6") to eight inch (8") below finished grade, directly above buried pipe.

F. Tag automatic controls, instruments, and relays. Key to control schematic.

G. Identify piping, concealed or exposed as indicated in schedule below. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 foot on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure and at each obstruction. Identify on both sides of any wall.

H. Provide color coded ceiling markers to locate valves, equipment, etc above T-bar type panel ceilings. Locate on the grid in the location closest to equipment.

I. Conform to owner's existing identification scheme. Verify with owner prior to bid.

3.03 IDENTIFICATION SCHEDULE

COMPONENT	IDENTIFICATION
Plumbing Equipment (softener, Water Heater, etc.)	Plastic Nameplates
Pumps (1 HP and Above)	Plastic Nameplates
Pumps (Below 1 HP)	Plastic Nameplates
All Valves	Tags
Control Panels and Other Major Control Components	Plastic Nameplates
Automatic Controls, Instruments, Relays	Tags
Piping (Larger than 3/4")	Plastic Tape Pipe Markers
Piping (3/4” and Smaller)	Plastic Tape Pipe Markers

END OF SECTION

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SECTION 22 07 16
PLUMBING EQUIPMENT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass (rigid)

B. Fiberglass (flexible)

C. Cellular foam

D. Jackets

1.02 RELATED SECTIONS

A. Specification Section 22 05 53 - Identification for Plumbing Piping and Equipment

B. Specification Section 22 11 16 - Domestic Plumbing Piping

1.03 REFERENCES

A. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

D. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulation Cement

E. ASTM C240 - Standard Test Methods of Testing Cellular Glass Insulation Block

F. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement

G. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

H. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

I. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation

J. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications

K. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type)

L. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation

M. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation

N. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

P. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials

Q. NAIMA National Insulation Standards

R. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials

S. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years

3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
a. Product Data

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Deliver, store, protect, and handle products to site.

B. Deliver materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Store insulation in original wrapping and protect from weather and construction traffic, dirt, water, chemical, and mechanical damage.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 FIBERGLASS (RIGID)

A. Manufacturers:
1. Owens Corning
2. Johns Manville
3. Engineer approved equal.

B. Insulation: ASTM C5612 rigid, non-combustible.
1. "K" Value: ASTM C335, 0.23 at 75 deg F.
2. Maximum Service Temperature: 450 deg F.
3. Maximum Moisture Absorption: 0.1% by volume.
4. Density: 6.0 lb/cu. ft.

C. Insulation: ASTM C553; flexible, noncombustible.
1. "K" Value: ASTM C177 or ASTM C518, 0.24 at 75 deg F.
2. Maximum Service Temperature: 250 deg F.
3. Maximum Moisture Absorption: 0.2% by volume.
4. Density: 6.0 lb/cu. ft.

D. Vapor Barrier Jacket: Kraft paper reinforced with fiberglass yarn and bonded to aluminized film.

E. Moisture Vapor Transmission: ASTM E96; procedure A; 0.02 perm.

F. Secure with self-sealing longitudinal laps and butt strips.

G. Secure with outward clinch expanding staples and vapor barrier mastic.

H. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

I. Vapor Barrier Lap Adhesive: Compatible with insulation.

J. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

2.02 FIBERGLASS (FLEXIBLE)

A. Insulation: ASTM C612; flexible, noncombustible.
   1. "K" Value: ASTM C177 or ASTM C518, 0.24 at 75 deg F.
   2. Maximum Service Temperature: 450 deg F.
   3. Maximum Moisture Absorption: 0.1% by volume.
   4. Density: 1.0 lb/cu. ft.

B. Vapor Barrier Jacket:
   1. Kraft paper reinforced with fiberglass yarn and bonded to aluminized film.
   2. Moisture Vapor Transmission: ASTM E96; 0.02 perm.
   3. Secure with self-sealing longitudinal laps and butt strips.
   4. Secure with outward clinch expanding staples and vapor barrier mastic.

C. Facing: Stainless steel one inch (1") hexagonal wire mesh stitched on one face of insulation.

D. Vapor Barrier Lap Adhesive: Compatible with insulation.

E. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

2.03 CELLULAR FOAM

A. Manufacturers:
   1. Armstrong
   2. Halstead
   3. Engineer approved equal.

B. Insulation:
   1. ASTM C534; flexible, cellular elastomeric, molded or sheet
   2. "K" Value: ASTM C177; 0.25 at 75 deg F.
   3. Minimum Service Temperature: -40 deg F.
   4. Maximum Service Temperature: 220 deg F.
   5. Maximum Moisture Absorption: ASTM D1056; 5.0% (pipe) by volume, 6.0% (sheet) by volume.
   6. Moisture Vapor Transmission: ASTM E96 procedure B; 0.20 perm-inches.
   7. Maximum Flame Spread: ASTM E84; 25
   8. Maximum Smoke Developed: ASTM E84; 50
   9. Connection: Waterproof vapor barrier adhesive.

C. Elastomeric Foam Adhesive:
   1. Manufacturers:
      a. Armstrong
      b. Halstead
      c. Engineer approved equal.
   2. Air-dried, contact adhesive, and compatible with insulation.

2.04 JACKETS

A. PVC Plastic Jacket:
   1. ASTM C921, sheet material, off-white color.
   2. Minimum Service Temperature: -40 deg F.
   3. Maximum Service Temperature: 150 deg F.
   4. Moisture Vapor Transmission: ASTM E96; 0.002 perm-inches.
   5. Thickness: 10 mil.
   6. Connections: Brush on welding adhesive.
   7. Covering Adhesive Mastic: Compatible with insulation.

B. Canvas Jacket: UL listed.
   1. Fabric: ASTM C921, 6 oz/sq yd, plain weave cotton treated with dilute fire retardant lagging adhesive.

2. Lagging Adhesive: Compatible with insulation.

C. Aluminum Jacket:
1. ASTM B209.
2. Thickness: 0.016 inch sheet.
3. Finish: Smooth.
4. Joining: Longitudinal slip joints and two inch (2") laps.
5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum. 0.010 inch thick stainless steel.

D. Stainless Steel Jacket:
1. ASTM A167 type #302 stainless steel.
2. Thickness: 0.010 inch.
3. Finish: Smooth.
4. Metal Jacket Bands: 3/8 inch wide; thick stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment has been tested before applying insulation materials.

B. Verify that surfaces are clean and dry with foreign material removed.

3.02 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Do not insulate factory-insulated equipment.

C. Exposed Equipment: Locate insulation and cover seams in least visible locations.

D. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires or bands.

E. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.

F. Insulated Equipment Containing Fluids Below Ambient Temperature:
1. Insulate entire system.
2. Provide vapor barrier jackets, factory applied or field applied.
3. Finish with vapor barrier adhesive.
4. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connectors, pump bodies, expansion joints, air separators and heat exchanger vessels.

G. Insulated Equipment Containing Fluids Above Ambient Temperature:
1. Provide standard jackets with vapor barrier, factory applied or field applied.
2. Hot equipment containing fluid 140 deg F or less do not insulate flanges and unions, but bevel and seal ends of insulation.
3. Hot equipment containing fluids over 140 deg F insulate flanges and unions with removable sections and jackets.
4. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connectors, pump bodies, expansion joints, air separators, and heat exchanger vessels.

H. Inserts and Shields:
1. Application: Equipment two inch (2") diameter or larger.
2. Shields: Galvanized steel between hangers an inserts.
3. Insert Location: Between support shield and equipment under the finish jacket.
4. Insert Configuration: Minimum six inch (6") long of same thickness and contour as adjoining insulation. May be factory lubricated.
5. Insert Material: Poly Iso-Cyanurate.

I. Finish insulation at supports, protrusions, and interrupters.

J. Do not insulate over nameplate or ASME stamp. Bevel and seal insulation around such.

K. Install insulation for equipment requiring access for maintenance, repair or cleaning in such a manner that it can be easily removed and replaced without damage.

L. Provide vapor barrier jackets, factory-applied to fiberglass insulated equipment containing fluids below ambient temperature. Finish with glass cloth and vapor barrier adhesive.

M. Do not insulate flanges and unions, however bevel and seal ends of insulation for hot equipment containing fluid 140 deg F or less.

N. Insulate flanges and unions with removable sections and jackets for hot equipment containing fluids over 140 deg F.

O. Finish insulation at supports, protrusions, and interruptions.

P. Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with canvas jacket sized for finish painting.

Q. Cover fiberglass insulation with metal mesh and finish with heavy coat of insulating cement.

R. Equipment Requiring Access for Maintenance, Repair or Cleaning: Install insulation so it can be easily removed and replaced without damage.

3.03 SCHEDULE

FIBERGLASS RIGID INSULATION

EQUIPMENT	THICKNESS
Plumbing Water Systems	1"
Hot Water Storage Tanks	1-1/2"

CELLULAR FOAM INSULATION

EQUIPMENT	THICKNESS
Plumbing Water Systems	3/4"
Expansion Tanks	3/4"
Water Softener	3/4"

END OF SECTION

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SECTION 22 07 19
DOMESTIC PLUMBING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass

B. Flexible elastomeric foam insulation

C. Jackets

1.02 RELATED SECTIONS

A. Specification Section 22 05 53 - Identification for Plumbing Piping and Equipment

1.03 REFERENCES

A. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus

D. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement

E. ASTM C240 - Standard Test Methods of Testing Cellular Glass Insulation Block

F. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement

G. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

H. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation

I. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

J. ASTM C547 - Standard Specification for Mineral Fiber Preformed Pipe Insulation

K. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation

L. ASTM C578 - Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation

M. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation

N. ASTM C610 - Standard Specification for Expanded Perlite Block and Pipe Thermal Insulation

O. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel

P. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation

Q. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

R. ASTM D1667 - Standard Specification for Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers

S. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

T. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics

U. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

V. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials

W. NAIMA National Insulation Standards

X. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials

Y. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to maximum flame spread/smoke developed rating of 25/50 in accordance with ASTM E84.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Accept materials on site, labeled with manufacturer's identification, product density and thickness.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 FIBERGLASS

A. Manufacturers:
   1. Johns Manville Micro-Lok HP
   2. Owens Corning
   3. Knauff
   4. Engineer approved equal.

B. Insulation: ASTM C547 rigid molded, noncombustible.

C. "K" Value: ASTM C335, 0.23 at 75 deg F.

D. Minimum Service Temperature: 0 deg F.

E. Maximum Service Temperature: 800 deg F.

F. Maximum Moisture Absorption: <5% by weight.

G. Vapor Barrier Jacket: ASTM C1136, white Kraft paper with fiberglass yarn, bonded to aluminized film.

H. Moisture Vapor Transmission: ASTM E96; 0.02 perm inches.

I. Secure with self-sealing longitudinal laps and butt strips.

J. Surface Burning: ASTM E84; Flame Spread-25, Smoke Developed-50

K. VOC Content: ASTM D5116; 0.15 g/l

2.02 FLEXIBLE ELASTOMERIC FOAM INSULATION

A. Manufacturers:
   1. Armacell: AP Armaflex
   2. Aerocel
   3. K-flex
   4. Engineer approved equal.

B. Insulation: ASTM C534 flexible cellular elastomeric molded sheet.

C. "K" Value: ASTM C177 or C518; 0.27 at 75 deg F.

D. Minimum Service Temperature: -40 deg F.

E. Maximum Service Temperature: 220 deg F.

F. Maximum Moisture Absorption: ASTM D1056, 5.0% by weight gain.

G. Maximum Water Vapor Permeability: ASTM E96; 0.05 perm-in.

H. Maximum Flame Spread: ASTM E84; 25

I. Maximum Smoke Developed: ASTM E84; 50

J. Insulated Pipe Hangers: Refer to the requirements for elastomeric insulation contained in the Inserts and Shields portion of this section.

K. Elastomeric Foam Adhesive:
   1. Manufacturers:
      a. Armstrong #BLV 520
      b. Aeroflex
      c. Halstead/K-Flex
      d. Engineer approved equal.
   2. Air-dried contact adhesive, compatible with insulation.
   3. VOC Content: 0 g/L as calculated and reported by SCAQMD 1168.

2.03 JACKETS

A. PVC Plastic:
   1. Manufacturers:
      a. Johns Manville Zeston
      b. Owens Corning
      c. PIC Plastics
      d. Engineer approved equal.
   2. Jacket: ASTM C921, UV resistant, one piece molded type fitting covers and sheet material, off white color.
   3. Minimum Service Temperature: 0 deg F.
   4. Maximum Service Temperature: 150 deg F.
   5. Moisture Vapor Transmission: ASTM E96; 0.002 perm inches.
   6. Maximum Flame Spread: ASTM E84; 25
   7. Maximum Smoke Developed: ASTM E84; 50
   8. Thickness: 20 mil.
   9. Connections: Brush on welding adhesive.

B. Covering Adhesive Mastic:
   1. Manufacturers:
      a. Johns Manville Perma-Weld
      b. PIC Plastics
      c. Engineer approved equal.
   2. Compatible with insulation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that piping has been tested before applying insulation materials.

B. Verify that surfaces are clean and dry with foreign material removed.

3.02 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Exposed Piping: Locate insulation and cover seams in least visible locations.

C. Insulated Dual Temperature Pipes or Cold Pipes Conveying Fluids Below Ambient Temperature:
   1. Provide vapor barrier jackets, factory applied or field applied.
   2. Insulate fittings, joints and valves with molded insulation of like material and thickness as adjacent pipe.
   3. Provide PVC fitting covers.
   4. Continue insulation through walls (unless in firewall sleeves), pipe hangers and other pipe penetrations.
   5. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
   6. Vapor seal insulation ends every 20 feet.

D. Insulated Pipes Conveying Fluids Above Ambient Temperature:
   1. Provide standard jackets with vapor barrier, factory applied.
   2. Insulate fittings, joints and valves with insulation of like material and thickness as adjoining pipe.
   3. Provide PVC fitting covers.
   4. Continue insulation through walls (unless in firewall sleeves) pipe hangers and other pipe penetrations.

E. Inserts and Shields:
   1. Manufacturers:
      a. Jeff Company/Buckaroo
      b. Amacell
      c. Cooper/Eaton
      d. TPS
      e. Engineer approved equal.
   2. Shields: Galvanized saddle with flared edges between pipe hangers or pipe hanger rolls and inserts.
   3. Insert Location: Between support shield and piping and under the vapor barrier and finish jacket.
   4. Insert Configuration: Minimum six inch (6") long of same thickness and contour as adjoining insulation; may be factory fabricated.
   5. Insert Type:
      a. Polystyrene and Fiberglass Insulation: 360 degree polyisocyanurate or phenolic foam cylindrical insert capable of supporting piping system. Pre-fabricated, insulated and jacketed supports are acceptable. Blocks, plugs, or wood material are not acceptable.
      b. Flexible Elastomeric Foam Insulation: Pre-fabricated 360 degree insulated pipe hanger with polyethylene inserts (Armacell "Armafix" or equal). Match thickness of pipe insulation. Hanger shall have PVC or aluminum jacket. Provide friction tape on inside of pipe clamp/support to avoid slipping.

F. Insulation shall be continuous at all hangers. Hanger shall not be in direct contact with pipe.

G. Insulation on piping served by heat trace shall be sized large enough to enclose the pipe and the heat wire.

3.03 TOLERANCE

A. Substituted insulation materials shall provide thermal resistance within 10% at normal conditions, as materials indicate.

3.04 SCHEDULE

FIBERGLASS INSULATION

PIPING SYSTEMS	PIPE SIZE	THICKNESS
Domestic Hot Water and Re-Circulation	Less than 1.5"	1"
Domestic Hot Water and Re-Circulation	1.5" and Larger	1.5"
Plumbing Vents within 10' of Exterior	All	1"
Domestic Cold Water	All	1"
Condensate Drain from Cooling Coil	All	1"
Horizontal Storm Downspouts in Building and Roof Drain Sumps	All	1"
Vertical Storm Downspouts in Building when PVC Piping is used	All	1"
Pumped Storm Water	All	1"
PVC Piping Installed in a Return Air Plenums (including Mechanical Rooms)	All	1.5"
All Storm Piping within 10' of Exterior	All	1"

FLEXIBLE ELASTOMERIC FOAM INSULATION

PIPING SYSTEMS	PIPE SIZE	THICKNESS
Domestic Hot Water and Re-Circulation	Less than 1.5"	1"
Domestic Hot Water and Re-Circulation	1.5" and Larger	1.5
Plumbing Vents Within 10' of Exterior	All	3/4"
Domestic Cold Water	All	3/4"
Pumped Storm Water	All	3/4"

PIPE JACKET SCHEDULE

PIPE LOCATION	JACKET MATERIAL
Piping in Mechanical/Electrical/Storage Room within 10' of floor (excluding racked piping)	PVC

END OF SECTION

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SECTION 22 11 16
DOMESTIC PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sanitary sewer piping (beyond 5 ft.)
B. Sanitary sewer piping (below grade)
C. Sanitary sewer piping (above grade)
D. Fire protection water service (below grade)
E. Water piping (beyond 5 ft.)
F. Water piping (below grade)
G. Water piping (above grade)
H. Storm water piping (below grade)
I. Storm water piping (above grade)
J. Ball valves
K. Butterfly valves
L. Spring loaded check valves
M. Water pressure reducing valves
N. Relief valves
O. Strainers
P. Fire stop systems
Q. Distilled and reverse osmosis water piping valves
R. Calibrated balance valves
S. Drain ball valves
T. Pipe accessories
U. Equipment drains and overflows

1.02 RELATED SECTIONS

A. Specification Section 22 05 53 - Identification for Plumbing Piping and Equipment

1.03 REFERENCES

A. ASME B31.1 - Power Piping
B. ASME B31.9 - Building Service Piping
C. ASME Section 9 - Welding and Brazing Qualifications
D. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800
E. ASME B16.3 - Malleable Iron Threaded Fittings
F. ASME B16.4 - Cast Iron Threaded Fittings Class 125 and 250
G. ASME B16.18 - Cast Bronze Solder - Joint Pressure Fittings
H. ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings
I. ASME B16.23 - Cast Copper Alloy Solder-Joint Drainage Fittings – DWV
J. ASME B16.26 - Cast Bronze Fittings for Flared Copper Tubes
K. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings - DWV
L. ASME B16.32 - Cast Copper Alloy Solder-Joint Fittings for Solvent Drainage Systems

M. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless
N. ASTM A74 - Cast Iron Soil Pipe and Fittings
O. ASTM B32 - Solder Metal
P. ASTM B43 - Seamless Red Brass Pipe
Q. ASTM B88 - Seamless Copper Water Tube
R. ASTM B306 - Copper Drainage Tube (DWV)
S. ASTM C14 - Concrete Sewer, Storm Drain and Culvert Pipe
T. ASTM C443 - Joints or Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
U. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings
V. ASTM D1785 - Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120
W. ASTM D2683 - Socket type Polyethylene fillings for outside diameter controlled polyethylene pipe
X. AWS A5.8 - Brazing Filler Metal
Y. AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids
Z. AWWA C110 - Ductile Iron Gray Iron Fittings three inch (3") through 48 inch for Water and Other Liquids
AA. AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
BB. AWWA C651 - Disinfecting Water Mains
CC. AWWA C900 - Poly Vinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, Four Inch (4") Through Sixty Inch (60")
DD. AWWA C907 - Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, Four Inch (4") Through Twelve Inch (12"), For Water, Wastewater, and Reclaimed Water Service
EE. CISPI 301 - Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary Systems
FF. CISPI 310 - Joints for Hubless Cast Iron Sanitary Systems
GG. NSF/ANSI 61 - Drinking Water System Components - Health Effects
HH. NSF/ANSI 372 - Drinking Water System Components - Lead Content

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data
      b. Schedule of all system types and piping and fitting types provided, clearly indicating which submitted piping and fittings are associated to each system on the project. Schedule shall be at the beginning of piping submittal.
      c. Installation Instructions
C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Operation and Maintenance Information, including spare parts list and exploded assembly views.

D. Project Record Documents
   1. Indicate final installed locations of all valves on a PDF floor plan

1.05 QUALITY ASSURANCE

A. Perform work in accordance with the State of Iowa.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

D. Welder's Certification: In accordance with ASME Section IX.

E. Identify pipe with marking including size, material classification, specification, potable water certification and water pressure rating.

F. Maintain one copy of each document on site.

G. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

H. All cast iron soil pipe and fittings shall be installed according to the latest edition of the Cast Iron Soil Pipe and Fittings Handbook.

1.06 REGULATORY REQUIREMENTS

A. Perform work in accordance with local jurisdiction plumbing code.

B. Conform to applicable code for installation of back flow prevention devices.

C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of back flow prevention devices.

D. Wetted surfaces of brass and bronze components shall contain <0.25% weighted average lead content (lead free) as defined by NSF/ANSI Standards 61 and 372.

1.07 DELIVERY, STORAGE AND PROTECTION

A. Deliver, store, protect and handle products to site.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary protective coating on cast iron and steel valves.

D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work and isolating parts of completed system.

1.08 WARRANTY

A. Provide a 25-year non-prorated warranty on PEX tubing.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 SANITARY SEWER PIPING (BEYOND 5 FEET)

A. Cast Iron Pipe:
   1. ASTM A74 service weight.
   2. Fittings: Cast iron.
   3. Joints: ASTM C564, neoprene gasket system. Neoprene O-ring.
   4. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

B. PVC Pipe:
   1. ATM D3034, SDR 23.5
   2. Fittings: PVC.

3. Joints: ASTM F477 elastomeric gaskets.

2.02 SANITARY SEWER PIPING (BELOW GRADE)

A. Cast Iron Pipe:
   1. ASTM A74 service weight.
   2. Fittings: Cast iron.
   3. Joints: ASTM C564, neoprene gasket system.
   4. Minimum Size: Three inches.
   5. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

B. PVC Pipe: Schedule 40
   1. ASTM D2665.
   2. Fittings: PVC.
   3. Joints: ASTM D2855 solvent weld with ASTM D2564 solvent cement.

2.03 SANITARY SEWER PIPING (ABOVE GRADE)

A. Cast Iron Pipe:
   1. CISPI 301 hubless service weight three inch (3") and larger.
   2. Fittings: Cast iron.
   3. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies conforming to CISPI 310.
   4. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

B. PVC Pipe:
   1. ASTM D2665.
   2. Fittings: PVC.
   3. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

C. Pumped Sewer and Elevator Sump Pump Discharge:
   1. Copper Tubing:
      a. ASTM B88, type #L hard drawn.
      b. Fittings: ASME B16.22, wrought copper and bronze.
      c. Joints: ASTM B32, solder, Grade 95TA.
   2. Galvanized Steel
      a. ASTM A53, Grade B Schedule 40, galvanized.
      b. Fittings: ASME B16.3, threaded type ASTM A47M.
      c. Joints: Threaded

2.04 FIRE PROTECTION WATER SERVICE (BELOW GRADE)

A. Ductile Iron Pipe (Class 52):
   1. AWWA C151, piping equal to or greater than 3 inches.
   2. Fittings: Ductile iron, standard thickness.
   3. Joints: AWWA C111, rubber gasket with 3/4" diameter rods.

2.05 WATER PIPING (BEYOND 5 FEET)

A. Piping Equal to or Greater Than Three (3) Inches:
   1. Cement lined ductile cast iron.
   2. Joints: Mechanical push-on with conductive neoprene gasket, AWA #C150, #C151.

B. Copper Tubing:
   1. ASTM B42 hard drawn.
   2. Fittings: ASME B16.18 cast copper alloy.
   3. Joints: ASTM B32, solder, Grade 95TA.

2.06 WATER PIPING (BELOW GRADE)

A. Copper Tubing:
   1. ASTM B88, type #K hard drawn, piping less than three inches.
   2. Fittings: ASME B16.18, cast bronze.
   3. Joints: AWS A5.8, BCuP silver braze.

B. Ductile Iron Pipe:
   1. AWWA C151, piping equal to or greater than three inches.
   2. Cement lined ductile iron pipe.
   3. Fittings: Ductile iron, standard thickness.
   4. Joints: AWWA C111, rubber gasket with 3/4 inch diameter rods.

2.07 WATER PIPING (ABOVE GRADE)

A. Copper Tubing:
   1. ASTM B88, type #L hard drawn.
   2. Fittings: ASME B16.22, wrought copper and bronze.
   3. Joints: ASTM B32, solder, Grade 95TA.
   4. Tee connections: Mechanically formed extruded outlets in accordance with ASME B31.9 with notched and dimpled branch tube.
      a. Installer shall be trained and certified by collaring tool manufacturer.

B. Stainless Steel, type 304 (2-1/2” and smaller)
   1. ASTM A312, NSF 61, schedule 10
   2. Mechanical Couplings: ASTM A536, NSF 61, ductile iron grooved mechanical couplings with fluoroelastomer blend gasket and blue enamel finish.
   3. Joints: ASTM A536, NSF 61, ductile iron grooved mechanical couplings or welded stainless steel.
   4. Fittings: ASTM A815/815M, AWWAC606, stainless steel.
   5. Manufacturers
      a. Victaulic
      b. Gruvlok
      c. Engineer approved equal

C. Cross-Linked Polyethylene (PEX) (2" AND SMALLER) (STICKS OF PEX)
   1. ASTM F876, SDR 9 polyethylene PEX-a or PEX-b tubing
      a. Rated for continuous operation by the Plastic Pipe Institute (PPI) at the following conditions: 160 psi @ 73.4 deg F, 100 psi @ 180 deg F, 80 psi @ 200 deg F.
      b. Minimum bend radius for cold bending of the pipe shall not be greater than 6 times the outside diameter of the pipe. Provide bend supports supplied by the tubing manufacturer for all bends with a radius tighter than this requirement.
      c. Plenum Rating: Pipe shall not exceed a maximum flame spread/smoke emission rating of 25/50 in compliance ASTM E84. Provide metal shields clipped to bottom side of piping or fully insulate piping as necessary to meet this requirement.
      d. Fittings: ASTM F2080 or ASTM F1960 cold-expansion, compression sleeve fittings. Provide specific fitting types as required to maintain warranty of piping manufacturer.
   2. Manufacturer shall provide components of the PEX tubing system including all plastic piping, fittings, manifolds, supports, and any other ancillary items required for a complete installation.
   3. Warranty: Plastic piping shall carry a 25-year non-prorated warranty against failure due to defect in material and workmanship. Manifolds, headers, thermostats, actuators, and other ancillary components shall be warranted for 12 months from date of substantial completion.

D. Steel Pipe:
   1. ASTM A53, Grade B, Schedule 40, galvanized three inches (3") and larger.
   2. Fittings: Galvanized

3. Joints: Grooved mechanical couplings.

E. Polyethylene/Aluminum Composition Tubing:
   1. ASTM F1281
   2. Fittings and Joints: Brass compression type.

2.08 STORM WATER PIPING (BELOW GRADE)

A. Cast Iron Pipe:
   1. ASTM A74 standard weight.
   2. Fittings: Cast iron.
   3. Joints: ASTM C564, neoprene gasket system.
   4. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

B. PVC Pipe: (Up to 10 Inch)
   1. ASTM D2665. Schedule 40
   2. Fittings: Schedule 40 PVC
   3. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

2.09 STORM WATER PIPING (ABOVE GRADE)

A. Cast Iron Pipe:
   1. ASTM A74 service weight.
   2. Fittings: Cast iron.
   3. Joints: ASTM C564, neoprene gasket system.
   4. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

B. Cast Iron Pipe:
   1. CISPI 301, hubless, service weight.
   2. Fittings: Cast iron.
   3. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies conforming to CISPI 310.
   4. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or be prior approved by engineer.

C. PVC Pipe:
   1. ASTM D1785 Schedule 40
   2. Fittings: PVC.
   3. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

2.10 BALL VALVES (UP TO AND INCLUDING 2 INCHES)

A. Manufacturers:
   1. Apollo #77CLF-140/240
   2. Watts #LFB 6080/6081 G2-SS
   3. Nibco #S/T-585-66-LF
   4. Milwaukee #UPBA-400S/450S
   5. Engineer approved equal.

B. Bronze two piece full port body, stainless steel ball and stem, RPTFE seats and thrust washer, lever handle, solder or threaded ends.

2.11 BUTTERFLY VALVES (OVER 2 INCHES)

A. Manufacturers:
   1. DeZurik
   2. Apollo
   3. Milwaukee
   4. Engineer approved equal.

B. Body: Cast iron with resilient replaceable EPDM seat, wafer or lug ends, extended neck.

C. Disc: Stainless steel 316.

D. Stem: Stainless steel 316.

E. Operator: Ten position lever handle. All butterfly valves six inch and larger shall have gear operated handles.

2.12 SPRING LOADED CHECK VALVES

A. Manufacturer:
   1. NIBCO
   2. Watts
   3. Apollo
   4. Engineer approved equal.

B. Check Valves:
   1. Up to 2 Inches: Spring loaded, silent water check valve, bronze body and trim. Stainless steel spring, threaded ends, 300 psi W.O.G. Renewable parts.
   2. Over 2 Inches: Spring loaded globe type, silent check valve, iron body, bronze trim. Stainless steel spring, 250 psi ASA flanged, 250 psi W.O.G. renewable parts.

2.13 WATER PRESSURE REDUCING VALVES

A. Manufacturers:
   1. Apollo #PR-LF
   2. Engineer approved equal.

B. Up to 2 Inches: Bronze body, stainless steel and thermo-plastic internal parts, fabric-reinforced diaphragm, strainer, threaded and single union ends.

C. Over 2 Inches: Cast iron body, bronze fitted, elastomeric diaphragm and seat disc, flanged.

2.14 RELIEF VALVES

A. Manufacturers:
   1. Bell & Gossett
   2. Taco
   3. Conbraco
   4. Engineer approved equal.

B. Pressure Relief: Bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated capacities ASME certified and labeled.

2.15 STRAINERS

A. Manufacturers:
   1. Metraflex
   2. Watts
   3. Engineer approved equal.

B. Size 2 Inches and Under: Screwed brass body for 175 psig working pressure, "Y" pattern with 1/32 inch stainless steel perforated screen.

C. Size 2-1/2" to 4 Inches: Flanged iron body for 175 psig working pressure, "Y" pattern with 3/64 inch stainless steel perforated screen.

D. Size 5" and Larger: Flanged iron body for 175 psig working pressure, basket pattern with 1/8 inch stainless steel perforated screen.

2.16 FIRE STOP SYSTEMS

A. Manufacturers:
   1. 3M
   2. Engineer approved equal.

B. General Purpose Fire Stopping Sealant: Water based, non-slumping, premixed sealant with intumescent properties, rated for 3 hours per ASTM E814 and UL 1479.

C. General Purpose Vibration Resistant Fire Stopping Sealant: Silicone based, non-slumping, premixed sealant with intumescent properties, vibration and moisture resistant, rated for three hours per ASTM E814 and UL 1479.

D. DWV Plastic Pipe Systems Fire Stopping Sealant: Silicone based, premixed sealant with intumescent properties, vibration and moisture resistant, rated for three hours per ASTM E814 and UL 1479 with metal collars.

2.17 DISTILLED AND REVERSE OSMOSIS WATER PIPING AND VALVES

A. All distilled and reverse osmosis water piping shall be ASTM A312, TP304L, Schedule 40 stainless steel pipe.

B. All fittings shall be ASTM A403 WP-WX304L Schedule 40 stainless steel.

C. All valve assemblies, including bodies, balls, and stems shall be #316 stainless steel.

2.18 CALIBRATED BALANCE VALVES

A. Manufacturers:
1. B & G Circuit Setter Plus
2. Taco
3. Watts
4. Victaulic
5. Engineer approved equal.

B. Construction:
1. Up to 3 Inches: Lead free brass.
2. Temperature and pressure test plug on inlet and outlet.
3. Memory stop.

2.19 DRAIN BALL VALVES

A. Manufacturers:
1. Apollo #95-ALF
2. Engineer approved equal.

B. Bronze two-piece full port body chrome plated ball and stem.

C. Teflon seats and stuffing, box ring, lever handle, drain cap and seal, solder ends.

2.20 PIPE ACCESSORIES

A. Fittings:
1. All fittings shall be of the same material as the pipe. Material joining the fitting to the pipe shall be free from cracks and shall adhere tightly to each joining surface.
2. All fittings shall be capped with a plug of the same material as the pipe, and gasketed with the same gasket material as the pipe joint or be of material approved by the engineer. The plug shall be able to withstand all test pressures involved without leakage.

2.21 EQUIPMENT DRAINS AND OVERFLOWS

A. Copper Tubing: ASTM B88, type #M, hard drawn.
1. Fittings: ASME B16.18 cast brass.
2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony or tin and silver with melting range 430 deg F to 535 deg F.

B. Steel Pipe: ASTM A53, Schedule 40, black. Minimum 0.375 inch wall for 12 inch and over.
1. Fittings: ASTM B16.3, malleable iron.
2. Joints: Threaded for pipe two inch (2") and under; AWS D1.1 welded for pipe over 2 inches.

C. PVC Pipe:

1. ASTM D2665, Schedule 40
2. Fittings: Schedule 40 PVC
3. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to conserve building space and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.

G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

H. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors.

I. Establish elevations of buried sanitary and storm sewer piping outside the building to ensure not less than four feet (4') of cover unless otherwise noted.

J. Establish elevations of buried water service outside the building to ensure not less than six feet (6') of cover unless otherwise noted.

K. Where pipe support members are welded to structural building frame, scrape, brush clean and apply one coat of zinc rich primer to welding.

L. Provide support for utility meters in accordance with requirements of utility companies.

M. Prepare exposed, unfinished pipe, fittings, supports and accessories not pre-finished, ready for finish painting.

N. Install bell and spigot pipe with bell end upstream.

O. Install valves with stems upright or horizontal, not inverted.

P. Install water piping to ASME B31.9.

Q. Sleeve pipes passing through partitions, walls and floors.

R. Clean out all sanitary sewers to remove any debris prior to substantial completion.

S. All cast iron soil pipe shall be installed in accordance with cast iron soil pipe institute handbook (latest edition).

T. All cast iron soil pipe shall be marked with the trademark of the soil pipe institute.

U. Where static water pressure in the water supply piping exceeds 80 psi, a water pressure reducing valve preceded by a strainer shall be installed and the static pressure reduced to 80 psi or less. Pressure regulator(s) equal to or exceeding 1-1/2 inches shall not require a strainer.

3.03 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

3.04 ERECTION TOLERANCES

A. Establish invert elevations, slopes for drainage to 1/8 inch per foot 1% minimum. Maintain gradients.

B. Slope water piping minimum 0.25% and arrange to drain at low points.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. The plumbing contractor is responsible for providing disinfection of domestic water piping system as outlined in this section.

B. Prior to starting work, verify system is complete, flush and clean.

C. The plumbing contractor is to make sure sanitary sewer lines are running smooth by running a snake through the sanitary sewer lines prior turning the facility over to the owner.

D. Ensure pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

E. Inject disinfectant, free chlorine in liquid, powder or tablet form throughout system to obtain 50- to 80 mg/L residual.

F. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15% of outlets.

G. Maintain disinfectant in system for 24 hours.

H. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

I. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

J. Take samples no sooner than 24 hours after flushing from 10% of outlets and from water entry and analyze in accordance with AWWA C651. Submit written report to owner.

K. Work in this section shall be by a pre-approved water treatment contractor.

3.06 TESTING

A. This contractor shall, before concealing, test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.

B. This contractor shall be held responsible for all damage resulting from defects in the system.

C. Domestic Water Testing:
   1. At conclusion of construction (before any covering up, painting, or finishing) each portion of the piping or of the entire hot and cold water supply system, it shall be initially tested to be proved tight under 50 psi air pressure. All piping shall withstand test pressures without leaking for a period of time not less than 15 minutes.
   2. The system shall not be filled with water until immediately prior to disinfection. A hydrostatic test to a water pressure of 1.5x working pressure up to a maximum of 150 psi shall be performed. All piping shall withstand test pressures without leaking for a period of time not less than 4 hours.

D. Sanitary and Storm Testing:
   1. A hydrostatic test to a water pressure of 10 feet shall be performed. All piping shall withstand test pressures without leaking for a period of time not less than 4 hours.

E. No covering or backfilling of sewer lines shall be done until inspected by the architect or local inspector. Test T's shall be provided on all waste and vent stacks 4'-6" above each floor as required for testing the plumbing system.

F. After completion of installation, the systems shall be given tests under full operating conditions and pressures and all adjustments shall be made to make the system operative as required. All safety devices shall be tested for correct operation.

3.07 SERVICE CONNECTIONS

A. Provide new sanitary and storm sewer services. Before commencing work check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves and sand strainer.
   1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
   2. Install service piping and valves as indicated on the site drawing. Provide thrust blocks at all changes in direction. Verify the local city requirements prior to bid.
   3. Install remote meter readout and associated wiring. Coordinate location with utility company.

C. The plumbing contractor is responsible to contact and inform the utility companies, prior to the utility companies coming to the site, of any underground utilities and piping they may be aware of.

D. Charges by the utility company to provide services shall not be included in the bid and shall be paid directly by the owner.

3.08 UTILITY CONNECTIONS

A. Connect to existing utility services as shown on the drawings or as required by site conditions.

B. Before running any new sewer piping, verify elevations where connections are to be made and layout the new sewer. If grades do not allow connection, verify with architect or engineer what procedures to use.

C. Use caution on sewer extensions so that grades do not become too shallow.

D. Coordinate equipment and installation requirements with local utility company.

E. Verify requirements prior to bid.

F. Charges by the utility company to provide services shall not be included in the bid and shall be paid directly by the owner.

G. The plumbing contractor is responsible to contact and inform the utility companies, prior to the utility companies coming to the site, of any underground utilities and piping they may be aware of.

3.09 SCHEDULES

A. See the drawings.

END OF SECTION

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SECTION 22 11 19
DOMESTIC PLUMBING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof drain
B. Floor drain
C. Clean out
D. Hose bib
E. Wall hydrant
F. Roof hydrant
G. Recessed valve box
H. Back water valve
I. Backflow preventer
J. Thermostatic mixing valve (TBV)
K. Water hammer arrestor

1.02 RELATED SECTIONS

A. Specification Section 22 11 16 - Domestic Plumbing Piping
B. Specification Section 22 30 00 - Plumbing Equipment
C. Specification Section 22 40 00 - Plumbing Fixtures

1.03 REFERENCES

A. ASME A113.6.3; Floor and Trench Drains
B. ASME A113.6.4 - Roof, Deck and Balcony Drains
C. ASSE 1010-01; Water Hammer Arrestors
D. ASSE 1011 - Hose Connection Vacuum Breakers
E. ASSE 1012 - Backflow Preventers with Immediate Atmospheric Vent
F. ASSE 1013 - Backflow Preventers, Reduced Pressure Principle
G. ASSE 1019 - Wall Hydrants, Frost Proof Automatic Draining Anti-Backflow Types
H. ASTM C478 - Precast Reinforced Concrete Manhole Sections (ASTM C478M - Precast Reinforced Concrete Manhole Sections
I. AWWA C506 - Backflow Prevention Devices - Reduced Pressure Principle and Double Check Valve Types
J. PDI G-101 - Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data
K. PDI WH-201 - Water Hammer Arrestors
L. NSF/ANSI 61 - Drinking Water System Components - Health Effects
M. NSF/ANSI 372 - Drinking Water System Components - Lead Content

1.04 SUBMITTALS

A. All submitted documents shall be:
    1. Digital (scanned documents are not acceptable)
    2. Current, within last 5 years
    3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
    4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
    1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Product Data: Provide component sizes, rough-in requirements, service sizes and finishes.
        b. Shop Drawings: Indicate dimensions, weights and placement of openings and holes.
        c. Certificates: Certify that grease interceptors meet or exceed specified requirements.
        d. Installation Instructions

C. Closeout submittal
    1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Operation and Maintenance Information, including required frequency of treatment for interceptors, spare parts lists, and exploded assembly views.

D. Project Record Documents
    1. Record actual locations of tagged valves, including valve tag numbers.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.06 DELIVERY, STORAGE AND PROTECTION

A. Accept specialties on site in original factory packaging. Inspect for damage.

1.07 REGULATORY REQUIREMENTS

A. Wetted surfaces of brass and bronze components shall contain <0.25% weighted average lead content (lead free) as defined by NSF/ANSI Standards 61 and 372.

PART 2 PRODUCTS

2.01 ROOF DRAINS (RD-1)

A. Manufacturers:
    1. Watts #RD-100 (up to 6")
    2. Watts #RD-300 (8" and over)
    3. Smith
    4. Zurn
    5. Josam
    6. Wade
    7. Engineer approved equal.

B. Assembly: ASME A112.6.4

C. Epoxy coated cast iron body with flashing clamps with integral gravel stop.

D. Accessories:
    1. Provide with sump receiver, under deck clamp and adjustable extension flange.
    2. Provide with elastomeric flange when installed with poured or troweled elastomeric composites.

E. Strainer: Removable aluminum dome.

F. Contractor shall select outlet type.

G. Outlet Size: See drawings.

2.02 ROOF DRAINS (ORD-1)

A. Same as RD-1 except with two inch (2") adjustable water dam or mounted two inch (2") higher on roof slope from RD-1.

2.03 FLOOR DRAIN (FD-1)

A. Manufacturers:
   1. Watts #FD-100
   2. Smith
   3. Zurn
   4. Josam
   5. Wade
   6. Engineer approved equal.

B. Assembly: ASME A112.6.3.

C. Epoxy coated cast iron floor drain with anchor flange, reversible clamping collar with primary and secondary weepholes and adjustable strainer.

D. Accessories:
   1. Provide with membrane clamp on all floor drains installed above slab ongrade.
   2. Provide with strainer extension to accommodate thick fills as required.

E. Strainer: Seven inch (7") diameter nickel bronze strainer.

F. Contractor shall select outlet type.

G. Outlet size: As noted on drawings.

H. Options: Provide where indicated:
   1. 6 x 6 square nickel bronze strainer.
   2. Heavy Duty (HD) strainer.
   3. 4" nickel bronze funnel.
   4. Sediment bucket.
   5. Trap primer.

2.04 CLEAN OUT

A. Manufacturers:
   1. Watts
   2. Smith
   3. Josam
   4. Wade
   5. Sun Drainage
   6. Engineer approved equal.

B. Interior Finished Sub or On Grade Floors:
   1. Watts #C0-200-R
   2. Lacquered cast iron bodies with integral anchor flange, neoprene "O" ring secondary test seal and adjustable combined access cover and plug with gasket seal. Nickel-bronze scoriated cover in service area and round with depressed cover to accept floor finish in finished floor areas.

C. Interior Finished Membrane Floor Areas:
   1. Watts #CO-200-C-R
   2. Lacquered cast iron, two piece body with double drainage flange, weep holes, reversible clamping collar and adjustable nickel-bronze strainer round with scoriated cover in service areas and round with depressed cover to accept floor finish in finished floor areas.

D. Interior Finished Wall Areas:
   1. Watts #CO-380-RD
   2. Line type with lacquered cast iron body and round epoxy coated gasket cover and round stainless steel access cover secured with machine screw.

E. Interior Unfinished Accessible Areas: Caulked or threaded type. Provide bolted stack clean out on vertical rainwater leaders and on horizontal accessible pipes.

F. Exterior Cleanouts:
   1. Provide with bronze plug and round heavy duty cast iron or nickel bronze cleanout cover equal to JOSAM 58680-CO.
   2. Refer to detail on drawings.

G. Cleanout size shall be equal to pipe size up to 4 inches.

2.05 HOSE BIB (HB-1)

A. Manufacturers:
   1. Woodford #B24
   2. Prier #C155CP.75
   3. Engineer approved equal.

B. Interior: Brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated lockable box and removable key, integral vacuum breaker in conformance with ASSE 1011.

2.06 WALL HYDRANT (WH-1)

A. Manufacturers:
   1. Woodford #B67
   2. Prier #C-634BX
   3. Engineer approved equal.

B. Type: ASSE 1019 non-freeze, self draining type with polished brass lockable recessed box hose thread spout, lockshield and removable key with integral double check backflow preventer.

C. 3/4" inlet and outlet.

D. Architect to select finish.

2.07 ROOF HYDRANT

A. Manufacturers:
   1. Woodford
   2. Prier
   3. Jay R. Smith Mfg. Co.
   4. Engineer approved equal.

B. ASSE 1052 backflow prevention, freeze proof, self draining type, anti-siphon with 3/4" hose nozzle, lockable handle, vacuum breaker, dual backflow preventer, flow control lock, max. pressure 100 psi.

C. Mounting System: Cast iron adjustable bracket support with above and under deck flange, well seals, EPDM boot cover.

2.08 RECESSED VALVE BOX (DRAIN ONLY)

A. Manufacturers:
   1. Guy Gray
   2. Engineer approved equal.

B. Pre-formed rough-in box with socket for two inch (2") center drain and slip in finishing cover.

C. Provide a stainless steel sleeve extension with wall flange, where recessed valve box is installed in a block wall.

2.09 RECESSED VALVE BOX (VB-1)

A. A. Manufacturers:
   1. Guy Gray
   2. Engineer approved equal.

B. White outlet box with 1/2" sweat connection with 3/8" outlet quarter turn valve with integral hammer arrester, and slip in finishing cover.

2.10 BACK WATER VALVES

A. Cast Iron:
   1. Manufacturers:
      a. Watts #BV-290
      b. Smith #7012-4-98
      c. Josam #67400
      d. Zurn #Z-1090
      e. Engineer approved equal.
   2. ANSI A112.21.2; Cast iron body and cover, bronze flapper assembly, six inch (6") extension sleeve, access cover and housing.

2.11 BACKFLOW PREVENTERS (RPZ, 2" AND SMALLER)

A. Manufacturers:
   1. Watts LF919
   2. Zurn/Wilkins
   3. Conbraco/Apollo
   4. Febco
   5. Ames
   6. Engineer approved equal.

B. Description: Reduced Pressure Zone Assembly consisting of two independent check valves with a pressure monitored chamber in between. The chamber contains a differential pressure relief valve that relieves excess pressure preventing back flow or back siphonage.

C. Construction:
   1. Springs: Stainless Steel
   2. Discs: Silicone
   3. Access ports: Device shall have 3 access ports. One for each check valve and one for the relief valve assembly. A single access port is not acceptable.

D. Accessories:
   1. Strainer: Y-type lead free strainer
   2. Air Gap Fitting: Provided by BFP manufacturer
   3. Shut off Valves: Quarter turn ball valves

E. Approvals:
   1. ASSE 1013
   2. Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.
   3. NSF/ANSI 61 (Less than 0.25% Lead by weight)
   4. UL Classified (not valves)

2.12 BACKFLOW PREVENTERS (RPZ, 2-1/2" AND LARGER)

A. Manufacturers:
   1. Watts LF957
   2. Zurn/Wilkins
   3. Conbraco/Apollo
   4. Febco
   5. Ames
   6. Engineer approved equal.

B. Description: Reduced Pressure Zone Assembly consisting of two independent check valves with a pressure monitored chamber in between. The chamber contains a differential pressure relief valve that relieves excess pressure preventing back flow or back siphonage.

C. Construction:
   1. Housing and Sleeve: 304 Stainless Steel

2. Springs: Stainless Steel
3. Discs: Silicone

D. Accessories:
1. Strainer: Stainless Steel Y-type lead free strainer
2. Air Gap Fitting: Provided by BFP manufacturer
3. Shut off Valves: Butterfly Valves

E. Approvals
1. ASSE 1013
2. Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California
3. NSF/ANSI 61 (Less than 0.25% Lead by weight)
4. UL Classified (less valves)

F. Flood Prevention Valve (Watts 113-6FRP or equal)
1. Description: Electrically operated flood prevention valve shall prevent excess water discharge from the RPZ relief valve due to a mechanical failure of the Backflow Preventer check valves.
2. Body: ANSI B16.42 Ductile Iron rated to 250 psig. Epoxy coated.
3. Trim: Stainless Steel Seat and retainer plate
4. Elastomers: FDA approved
5. Accessories:
a. Flow Switch (installed by mechanical contractor in the RPZ relief valve discharge pipe)
b. Control/Junction Box: NEMA 4X

2.13 BEVERAGE DISPENSING BACKFLOW PREVENTERS (CARBONATED BEVERAGE, COFFEE MAKERS, ETC)

A. Manufacturers:
1. Watts SD-3
2. Zurn
3. Apollo
4. Engineer approved equal.

B. Description: 3/8” dual check device with atmospheric vent port designed to protect the domestic water supply from direct connect beverage machines. Manufacturer provided wye strainer. Vent port opens to atmosphere in the event of second check valve failure.

C. Construction:
1. Body: 316 Stainless Steel
2. Internal Components: FDA approved rubber
3. Strainer: NSF approved acetal plastic

D. Accessories
1. Shut-off: Stainless steel ball valve

E. Approvals:
1. ASSE 1032
2. NSF/ANSI Standards 18 and 61

F. Installation
1. Able to be installed horizontally or vertically.
2. Install so that strainer and valve are accessible for service and maintenance. Device shall not be installed within a wall cavity.
3. Connect a vent discharge line to the vent outlet and route to nearby floor drain or floor sink.

2.14 THERMOSTATIC BALANCING VALVE

A. Manufacturers
   1. ThermOmegaTech Circuit Solver
   2. Engineer approved equal

B. Provide a self contained, self-acting thermostatic balancing valve which automatically and continuously maintains the end of each domestic hot water supply line at the specified water temperature 110°F.

C. This thermostatic balancing valve shall regulate the flow of recirculated domestic hot water based on entering water temperature regardless of system operating pressure.
   1. Even when fully closed, the valve shall bypass a small amount of hot water to maintain dynamic control of the recirculating loop.
   2. Provide valve at each location matching pipe size from 1/2" to 2".

D. Valve body and all internal components shall be constructed of stainless steel with major components constructed of type 303 stainless steel and NSF-61 certified for use in all domestic water systems.
   1. Thermal actuator shall be spring loaded and self cleaning, delivering closing thrust sufficient to keep orifice opening free of scale deposits.
   2. Valve shall be rated to 200 psig maximum working pressure and 300°F maximum working temperature.

E. Install valve in each domestic hot water return piping branch beyond last hot water device in that branch.
   1. Provide line size isolation valves on both sides of TBV. Isolation valves may be installed separately or the TBV with an integrated union assembly may be installed with a union and ball valves.
   2. Provide access panel as required in non-accessible ceilings and walls. Coordinate size and locations with Design Team prior to piping rough-in.

2.15 WATER HAMMER ARRESTOR

A. Manufacturers:
   1. Zurn "Shoktro" #Z-1700
   2. Sioux Chief
   3. Engineer approved equal.

B. ANSI A112.26.1; sized in accordance with PDI WH-201 pre-charged suitable for operation in temperature range of -100 deg to 250 deg F and maximum 350 psig working pressure.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate cutting and forming of roof and floor construction to receive drains to require invert elevations.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Extend clean out to finished floor or wall surface. Lubricate threaded clean out plugs with mixture of graphite and linseed oil. Ensure clearance at clean out for rodding of drainage system. Coordinate all cleanout locations with the architect.

C. Furnish and install cleanouts at locations as specified and required by local plumbing code.

D. Pipe relief from backflow preventer to nearest drain.

E. Encase exterior clean out in concrete flush with grade.

F. Install floor clean out at elevation to accommodate finished floor.

G. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior hose bibbs and exterior wall hydrants.

H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures. Fabricate same size as supply pipe or 3/4 inch minimum and minimum 18 inch long.

I. Install air gap fittings at all equipment drains when equipment is connected to domestic water.

J. Provide floor drains installed above slab on-grade with membrane clamp and 3' x 3' vinyl membrane. Membrane is by the mechanical contractor.

K. Coordinate all floor drain locations with associated equipment.

L. Coordinate all wall mounted device locations with architect.

M. Install flood protection shutdown valve upstream of building backflow preventer.

N. Install back water valves where required by local codes. Coordinate with architect.

END OF SECTION

SECTION 22 30 00
PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial high efficiency sealed combustion water heater
B. Electric water heater (Commercial)
C. Water softener
D. In-line circulator pump

1.02 REFERENCES

A. ASHRAE 90A - Energy Conservation in New Building Design
B. ASME Section 8D - Pressure Vessels
C. NFPA 30 - Flammable and Combustible Liquids Code
D. NFPA 54 - National Fuel Gas Code
E. NFPA 58 - Storage and Handling of Liquefied Petroleum Gases
F. NFPA 70 - National Electrical Code
G. UL 1453 - Electric Booster and Commercial Storage Tank Water Heaters
H. UL 174 - Household Electric Storage Tank Water Heaters
I. ASME Section VIIID - Pressure Vessels; Boiler and Pressure Vessel Codes
J. ANSI/NEMA 250 - Enclosure for Electrical Equipment (1000 volts max.)
K. NSF/ANSI 61 - Drinking Water System Components - Health Effects
L. NSF/ANSI 372 - Drinking Water System Components - Lead Content

1.03 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data:
   2. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
   3. Indicate pump type, capacity, power requirements, and affected adjacent construction.
   4. Provide certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
   5. Provide electrical characteristics and connection requirements.
      a. Shop Drawings:
   6. Indicate heat exchanger dimensions, size of tappings, and performance data.
   7. Indicate dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.
C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.

a. Operation and Maintenance Information, including inspection data, replacement part numbers, availability, service depot location, and telephone number.
b. Warranty: Submit manufacturer warranty and ensure forms have been completed in owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Provide pumps with manufacturer's name, model number, and rating/capacity identified.

C. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:
1. American Gas Association (AGA)
2. National Sanitation Foundation (NSF)
3. American Society of Mechanical Engineers (ASME)
4. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI)
5. National Electrical Manufacturers' Association (NEMA)
6. Underwriters Laboratories (UL)

D. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation; operate within 25% of midpoint of published maximum efficiency curve.

1.05 REGULATORY REQUIREMENTS

A. Conform to NSF, NBBPVI, and ANSI/NFPA requirements for water heaters.

B. Conform to ASME Section VIIID for manufacture of pressure vessels for heat exchangers.

C. Conform to ASME Section VIIID for tanks.

D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

E. Wetted surfaces of brass and bronze components shall contain <0.25% weighted average lead content (lead free) as defined by NSF/ANSI Standards 61 and 372.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Deliver, store, protect and handle products to site under provisions of Architectural Specification Sections.

B. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.07 WARRANTY

A. Electric Water Heaters: Provide a three-year tank and one-year parts manufacturer warranty for electric water heaters.

B. Water Softeners: Provide a three-year manufacturer warranty.

C. In-Line Circulator Pumps: Provide a three-year manufacturer warranty.

1.08 MAINTENANCE PRODUCTS

A. Supply two 50 lb. bags of water softener salt.

B. Provide each water softener system full of salt at substantial completion.

1.09 EXTRA MATERIALS

A. Provide two pump seals.

PART 2 PRODUCTS

2.01 COMMERCIAL HIGH EFFICIENCY SEALED COMBUSTION WATER HEATER

A. Manufacturers:
   1. A.O. Smith Cyclone
   2. Lochinvar Shield
   3. Bock Optitherm
   4. Ruud Triton
   5. PVI Conquest
   6. Laars UHE
   7. Engineer approved equal.

B. Provide PVC sealed combustion and power vent pipe complete with intake and flue terminations.

C. Type: Automatic, natural gas-fired, vertical storage with sealed combustion and direct power vent.

D. Performance: See schedule.

E. Tank: Glass lined welded steel, four inch (4") diameter inspection port, thermally insulated with minimum two inch (2") fiberglass and encased in corrosion-resistant steel jacket; baked-on enamel finish; floor shield and legs, tested and stamped in accordance with Section VIIID of ASME Code.

F. Accessories: Brass water connections and dip tube, drain valve, powered non-sacrificial anode or dual magnesium anodes, and ASME temperature and pressure relief valve. Pipe relief valve to above floor drain.

G. Approval: By AGA as automatic storage water heater and automatic circulating tank water heater for operation at 140 deg F.

H. Controls: Automatic water thermostat with temperature range adjustable from 120-180 deg F gas pressure regulator, multi-ribbon or tubular burner, 100% safety shut off and thermocoupler, flue baffles and draft hood. Intermittent pilot operation with automatic flue power vent fan.

I. Provide PVC flue and intake through wall or roof, per manufacturer's installation recommendations. Provide roof flashing, counter flashing and rain cap.

J. Provide one diaphragm expansion tank rated for a maximum allowable working pressure equal to or greater than the pressure of the water heater. Refer to drawings for expansion tank sizing.

2.02 ELECTRIC WATER HEATER (COMMERCIAL)

A. Manufacturer:
   1. Bradford White
   2. A.O. Smith
   3. State
   4. Rheem
   5. Engineer approved equal.

B. Type: Factory-assembled and wired, electric, vertical storage.

C. Performance: See schedule.

D. Tank: Glass lined welded steel; four inch (4") diameter inspection port, thermally insulated with minimum 2-1/2" polyurethane encased in corrosion-resistant steel jacket; baked-on enamel finish.

E. Controls: Automatic water thermostat with externally adjustable temperature range from 120 to 140 deg F, flanged or screw-in nichrome elements, enclosed controls and electrical junction box. Wire double element units so elements do not operate simultaneously, unless noted otherwise.

F. Accessories: Brass water connections and dip tube, drain valve, magnesium anode, and ASME rated temperature and pressure relief valve.

2.03 WATER SOFTENER (MULTI-TANK)

A. Manufacturers:
   1. Water Control Corporation
   2. Culligan
   3. Marlo
   4. Ecowater Systems
   5. Kinetico
   6. Engineer approved equal.

B. Provide as indicated a vertical pressure type water softener system complete with pressure vessel, softening resin, control valve, brine maker and electronic controller. The system will be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material will be supplied in compliance with the specifications as intended for a complete and operational system.

C. The purpose of the automatic water softener will be to remove mineral hardness from a known water supply to a level not to exceed 17.1 mg/l, as determined by an accepted ASTM or EDTA test method.

D. There shall be a quantity of one (1) of the above described systems.

E. Performance and Design Data
   1. See schedule on the drawings.

F. Softener Tank(s)
   1. Each system shall include two (2). The overall tank height (less base) shall be sufficient to allow for a proper freeboard space above the resin bed for adequate expansion of the resin during backwashing.

G. Main Operating Valve
   1. The main operating valve shall be of a top mount design constructed of all brass and sized with 2.0 inch NPTI inlet and outlet connections.
   2. The main operating valve will be of the motor driven, mechanically activated design with five (5) positions to accomplish the regeneration steps of backwash, brine draw/rinse, fast rinse and brine refill, in addition to the service position.
   3. The main operating valve shall incorporate self adjusting flow regulators to control the rate of flow and prevent resin loss during backwash regardless of system pressure fluctuations between 30.0 and 120.0 psi.
   4. The main operating valve will be fitted with a fixed orifice eductor.
   5. The unit shall be supplied so that the valve will not allow automatic bypass of untreated water during regeneration. The bypass shall be integral to the main operating valve body and be capable of being easily modified to allow untreated water bypass.

H. Controls
   1. A fully integrated programmable microprocessor driven electronic controller shall be provided to automatically cycle the main operating valve through the regeneration sequence. The electronic controller shall be designed and manufactured by the same manufacturer as the water treatment equipment.
   2. The controller shall be capable of initiating a regeneration by accepting an internal signal from the controller time keeping device; an external Hall-Effect flow sensor, an external device such as a remote start push-button or any combination of these methods. The controller shall sequence all steps of an automatic regeneration and automatically return the softener to a service or stand-by mode. The initiating time and/or volume setpoints shall automatically reset upon completion of the regeneration sequence.

3. The controller shall include a sealed keypad, capable of programming all controller functions, located inside the controller enclosure. The controller display shall be a multi-line OLED display capable of full text readouts of operating status and codes.
4. An audible alarm beeper capable of emitting a tone of ~70 dBA shall be available but capable of being disabled if so desired.
5. The controller shall allow for a manual initiation of the automatic regeneration sequence by utilizing a regeneration selection from the controller program.
6. The controller shall operate on a low voltage electrical system. The system shall include a UL/CUL listed transformer. The entire electronic control package and its associated inputs/outputs shall require not more than 24 VAC @ 100VA.
7. The controller shall utilize EEPROM to save pertinent programmed data and statistical functions. The controller must retain all functionality for power interruptions of less than 12 hours. A battery backup shall be installed and capable of maintaining the time of day for a minimum of 5 years.

I. System control options
1. An operator selected program of immediate or delayed volume initiated regeneration for parallel/progressive configurations shall be available. The controller shall be capable of being programmed in the field without additional interface devices. The controller shall indicate various data that includes flow rate, capacity remaining, total flow since installation, number of regenerations in the last 14 days, days since the last regeneration, total number of regenerations for the life of the unit, time of day, Progressive Flow Trip Point, and unit in regeneration.
2. Each control shall have a dedicated flow sensor. Mode of operation shall be as follows:
3. Each controller shall be programmed with a Trip Point. The purpose of the Trip Point shall be to bring additional tanks to an on line status from stand by once the treated water flow demand of the facility meets the Trip Point flow rate. Systems having three media tanks will have tanks brought on line as multiples of the Trip Point flow rate are attained. Tanks shall be taken back off line as flow decreases to a level less than the Trip Point multiple for a minimum of 60 seconds.
4. Each controller shall allow for a regeneration delay. The purpose of the delay shall be to inhibit consecutive regenerations thereby allowing a suitable amount of time to pass between regenerations for making saturated brine solution.
5. Multiple Unit Communication input/output shall be type RS485. The communication input/output feature will recognize when another controller within a multiple controller system is in a regeneration sequence, prohibiting the chance of multiple units regenerating simultaneously.
    a. In addition the following functions shall be provided as part of the system controller:
6. Regeneration sequence timers: The controller shall allow control customization of individual regeneration cycle times, each programmable from 1 - 99 minutes. The regeneration cycle and time of cycle remaining shall be displayed when in regeneration.
7. Lockout function: The controller shall include a lockout to prevent unauthorized personnel from altering program data.
8. Regeneration override: The controller shall include a function to direct pre-programmed regeneration after a user determined period of time (hours or 24 hour intervals) without an input signal from another regeneration initiation device.
9. Alarm status indicator: The controller shall monitor operation of internal functions. If a fault is identified, the need for operator intervention will be signaled visually within the controller display.
10. Two Auxiliary Outputs: Two Auxiliary Outputs shall be integral to the controller circuit board. Each Output shall be capable of being programmed to provide power to a "Normally Open" or "Normally Closed" contact (user choice). These 24VAC outputs shall be used only for the purpose of energizing a relay coil.
11. Flow rate indication: The controller shall be capable of indicating the flow rate of the treated water.

12. Totalizer: The controller shall include a totalizer function and a display capacity to 99,999,999 units before resetting to zero. The totalizer value shall be displayed through the controller display during operation.

J. Flow Sensor(s)
   1. A flow sensor package shall be provided consisting of an insertion-type Hall Effect flow transducer with an appropriately sized installation fitting; the package shall include a total of two (2) flow sensors with fittings.
   2. The fitting provided shall be 2.0 inches, compatible with the specified piping. It will be designed to allow ease of removal of the sensor for inspection without modification of the piping system. A 15 foot length of cable shall be provided for direct connection to the system controller.
   3. The flow sensor package provided shall be functional within the flow range of 1.5 to 150.0 gpm and will be provided with a 2.0" flow sensor installation fitting.
   4. The operating temperature/pressure range of flow sensor fittings shall be 34°-100°F at 100.0 psi max.
   5. The wetted surfaces of the flow sensor shall be constructed of non-corroding materials such as polypropylene, black Polyvinylidene (PVDF) and titanium.
   6. The flow sensor shall have an accuracy to 1% over full range and repeatability to +/-0.5% of full range.

K. Exchange Resin
   1. The ion exchange resin shall be virgin high capacity "standard mesh" of sulfonated polystyrene type stable over the entire pH range with good resistance to bead fracture from attrition or osmotic shock. The resin shall be solid, U.S. standard screen and will contain no agglomerates, shells, plates or other shapes that might interfere with the normal function of the water softener. The resin shall be manufactured to comply with the food additive regulation 21 CFR 173.25 as set forth by the USFDA.
   2. The system shall include 5.0 ft^3 of exchange resin per vessel and a total of 15.0 ft^3 of resin for the system.

L. Brine System
   1. Provide a complete brine system consisting of a plastic tank, cover, salt platform, brine well, an automatic brine valve and all necessary fittings for operation with the water softening system. The system shall consist of a combined brine measuring and salt storage tank with salt platform. The system will include a total of one (1) brine tank(s).
   2. The brine tank will be equipped with a float operated non-corrosive field serviceable brine float valve for automatic control of brine withdrawal and fresh water refill.
   3. The brine valve will automatically open to admit brine to the resin tank during eduction and close automatically providing positive shut-off to prevent air from entering the system. The brine valve will also regulate the flow of soft water into the brine tank during refill. The brine valve works with the timed fill feature of the main operating valve controls to admit the correct volume of fresh water to the brine tank in accordance with the refill time setting in the control program. The brine valve will include a float operated safety shut-off valve as a back up to the timed refill from the main operating valve control to prevent brine tank overflow.

M. Accessories
   1. Water test kits for hardness tests will be supplied.
   2. Pressure Gauges for hard water inlet and soft water outlet.
   3. Vacuum Breaker for protecting Fiberglass tanks from vacuum.

N. Field Service
   1. The services of a factory authorized service representative can be made available to supervise, inspect and provide operator training as required for initial start-up and system operation.

2.04 IN-LINE CIRCULATOR PUMP

A. Manufacturer:
   1. B & G
   2. Taco
   3. Grundfos
   4. Engineer approved equal.

B. Performance: See schedule on drawings.

C. Casing: Bronze, rated for 125 psig working pressure.

D. Impeller: Bronze or stainless steel.

E. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.

F. Seal: Carbon rotating against a stationary ceramic seat.

G. Drive: Flexible coupling.

PART 3 EXECUTION

3.01 WATER HEATER INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Coordinate with plumbing piping and related fuel piping, gas venting, and, electrical work to achieve operating system.

C. Install unit with clearance for removal without disturbing other installed equipment or piping.

D. Pipe relief valves and drains to nearest floor drain.

3.02 PUMP INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Ensure shaft length allows sump pumps to be located 25 inch minimum below lowest invert into sump pit and six inch (6") minimum clearance from bottom of sump pit.

C. Provide air cock and drain connection on horizontal pump casings.

D. Provide line sized isolating valve and strainer on suction.

E. Provide line sized soft-seated check valve and balancing valve on discharge.

F. Decrease from line size with long radius reducing elbows or reducers.

G. Support piping adjacent to pump such that no weight is carried on pump casings.

H. Provide supports under elbows on pump suction and discharge line sizes four inch (4") and over.

I. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation and operate within 25% of midpoint of published maximum efficiency curve.

J. Install aquastat on hot water recirculation pipe to control water heater re-circulation pump.

K. Low voltage wiring shall be by the mechanical contractor unless otherwise noted.

3.03 WATER SOFTENER INSTALLATION

A. Install as per manufacturer's instructions.

B. Connect cold hard water, soft cold water, and brine piping to unit.

C. Pipe back flush to floor drain with standpipe.

3.04 CONNECTION TO EQUIPMENT FURNISHED BY OWNER

A. This contractor shall furnish all connections to equipment furnished by the owner.

B. This equipment shall include, but not be limited to the following:
   1. Air compressor.

2. Washer.
3. Hose dryer.
4. Shop vac.
5. Power washer.
6. Stove range hood.

END OF SECTION

SECTION 22 40 00
PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. See plumbing fixture schedules on drawings.

1.02 RELATED SECTIONS

A. Specification Section 22 0529 - Hangers and Supports for Plumbing Piping and Equipment

B. Specification Section 22 1116 - Domestic Plumbing Piping

C. Specification Section 22 1119 - Domestic Plumbing Specialties

D. Specification Section 22 3000 - Plumbing Equipment

1.03 REFERENCES

A. ANSI Z124.1 - Gel-Coated Fiberglass Reinforced Polyester Resin Bathtub Units

B. ANSI Z124.2 - Gel-Coated Fiberglass Reinforced Polyester Resin Shower Receptor and Shower Stall Units

C. ANSI Z358.1 - Emergency Eye Wash and Shower Equipment

D. ARI 1010 - Drinking Fountains and Self-Contained Mechanically Refrigerated Drinking Water Coolers

E. ASME A112.6.1 - Supports for Off-the-Floor Plumbing Fixtures for Public Use

F. ASME A112.18.1 - Finished and Rough Brass Plumbing Fixture Fittings

G. ASME A112.19.1 - Enameled Cast Iron Plumbing Fixtures

H. ASME A112.19.2 - Vitreous China Plumbing Fixtures

I. ASME A112.19.3 - Stainless Steel Plumbing Fixtures (Designed for Residential Use)

J. ASME A112.19.4 - Porcelain Enameled Formed Steel Plumbing Fixtures

K. ASME A112.19.5 - Trim for Water-Closet Bowls, Tanks, and Urinals

L. NFPA 70 - National Electrical Code

M. NSF/ANSI 61 - Drinking Water System Components - Health Effects

N. NSF/ANSI 372 - Drinking Water System Components - Lead Content

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data: Provide catalog illustrations of fixtures, sizes, rough in dimensions, utility sizes, trim, and finish.
      b. Installation Instructions
      c. Note: The mechanical contractor shall coordinate all fixtures with general construction and cabinetry prior to submitting for review.

C. Closeout submittal

1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
    a. Operation and Maintenance Information, including fixture trim exploded view and replacement parts lists.
    b. Warranty: Submit manufacturer warranty and ensure forms have been completed in owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

B. Wetted surfaces of brass and bronze components shall contain <0.25% weighted average lead content (lead free) as defined by NSF/ANSI Standards 61 and 372.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Accept fixtures on site in factory packaging. Inspect for damage.

B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.08 WARRANTY

A. Provide manufacturer's standard warranty for electric water cooler.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

B. Verify that electric power is available and of the correct characteristics.

C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks prior to ordering.

D. Confirm that hole drillings are of appropriate number and spacing for trim.

3.02 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install each fixture with trap, easily removable for servicing and cleaning.

C. Provide chrome plated rigid or flexible supplies to fixtures with 1/4 turn loose key stops, reducers and escutcheons.

D. Install components level and plumb.

E. Install and secure fixtures in place with wall supports or wall carriers and bolts.

F. Seal fixtures to wall and floor surfaces with sealant. Color to match fixture.

G. Solidly attach water closets to floor with lag screws. Flashing is not intended to hold fixture in place.

H. Coordinate electronic faucet under deck mixing valve and control module installation such that they do not extend passed the footprint of the plumbing fixture. The control module shall be installed over the low voltage junction box.

I. Water Coolers: Confirm mounting height of all water coolers with the architect and AHJ prior to rough in.

J. Water Coolers: Power source shall be a GFCI circuit breaker. A GFCI receptacle is not permissible. Coordinate with the electrical contractor.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise or overflow.

3.06 CLEANING

A. Clean plumbing fixtures and equipment.

END OF SECTION

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SECTION 23 00 50
BASIC HVAC REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic HVAC Requirements specifically applicable to Mechanical Division Specification Sections.

B. Division 23 Specification requirements also include, by reference, all Division 00 and 01 specification sections. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

1.02 OWNER OCCUPANCY

A. The owner will not occupy the premises during the construction period.

1.03 REGULATORY REQUIREMENTS

A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.

B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by themselves, by their employees or through any operation under their charge, whether in the contract or extra work.

C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.

D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve the contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.

E. All work shall comply with the applicable recommendations of:
   1. The National Board of Fire Underwriters
   2. American Gas Association
   3. The National Fire Protection Association (NFPA)
   4. The Occupations Safety and Health Act (OSHA)
   5. Current IBC Building Code
   6. Current applicable city building codes.
   7. Current International Energy Conservation Code

F. Mechanical: Conform to current mechanical code.

G. Plumbing: Conform to current plumbing code.

H. Obtain permits and request inspections from authority having jurisdiction.

1.04 PROJECT/SITE CONDITIONS

A. Install work in locations shown on the drawings unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer before proceeding.

C. This contractor, before submitting their bid, shall visit their the site of the project to familiarize themselves with locations and conditions affecting their work.

D. It is the intent of this specification that the contractor furnishes all labor and material required completing the installation as outlined in the drawings and specifications. No additions to the contract price shall be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing piping, ductwork, equipment, services and grades be noted on the job site before bid is submitted and that all elevations and grades be verified before roughing in new work.

F. This contractor shall provide holes as necessary for the installation of their work and in accordance with other specification sections in materials other than the structure.

1.05 SEQUENCING AND SCHEDULING

A. This contractor shall arrange their work in order that it progresses along with the general construction of the building.

B. This contractor shall be kept informed as to the work of other trades engaged in the project and shall execute their work in such a manner so as not to delay or interfere with progress of other contractors.

C. Where space for mechanical and electrical lines and piping is limited, it is imperative that all such trades coordinate their work so as to ensure concealment in space provided. Where conflict exists, the engineer shall decide priority of space. If work is not properly coordinated, the engineer may require removal and relocation of work without additional compensation.

1.06 GUARANTEE

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished and labor installed under this contract for a period of one year after date of final acceptance, unless a longer period is specified.

B. Neither final certificate of payment, nor any provisions in the contract documents, nor partial or complete occupancy of premises by owner, nor substantial completion of the work, shall constitute an acceptance for work not done in accordance with contract documents, or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

C. Should any defects arise as the result of defective workmanship or material within the guarantee period set forth, this contractor shall make the necessary correction at their own expense.

1.07 ENGINEER APPROVED EQUAL PRODUCTS

A. When the engineer, at the request of the interested parties, including the contractor, supplier and manufacturer approved "engineer approved equal" products for this project, such products are approved on the assumption that they will equal or exceed the performance of the products specified.

B. If such products do not do so after being installed on this project, this contractor shall replace or modify the particular product as necessary to equal the performance of the products specified at no expense to the owner, architect or engineer.

C. Request for "engineer approved equal" products shall be received by the architect/engineer prior to the last addendum being issued. Requests for substitutions received after this date will not be considered. Substitution requests shall clearly state which products are being considered for substitution. Substitution requests shall include all pertinent product information needed to evaluate the substitution as an "equal".

D. Similar products shall be all of the same manufacturers and style. There is no exception to this unless prior approval has been granted from engineer.

1.08 OWNER'S RIGHT OF SALVAGE

A. Before beginning construction, this contractor shall check and verify with the owner each item of existing equipment that must be removed.

B. The owner will designate which items of material or equipment not reused that they may wish to keep. The contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.

C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their use shall become the property of the contractor and shall be removed from site.

1.09 PROTECTION AND MAINTENANCE

A. Where necessary to connect to any existing utility service, this contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.

B. Any work to be done in existing structures shall be coordinated with the owner and arrangements made so that traffic flow may be maintained and areas finished where possible before other areas are begun.

C. This contractor shall protect existing equipment in finished areas from dirt, dust and damage as a result of their work.

D. Coordinate protection requirements with department heads before beginning construction.

E. Protect any building openings from unauthorized entry. Coordinate with owner where building entry must be controlled.

1.10 DEMOLITION

A. This contractor shall be responsible for the demolition and removal of all existing mechanical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.
   4. All elements to be removed are subject to the Owner's Right of Salvage.

B. Preserve services to the existing facility. Extend/reroute/reconnect existing systems as required providing for the continued function of these systems.

1.11 TEMPORARY HEATING, VENTILATION, AND AIR CONDITIONING

A. Coordinate provisions for temporary heating, cooling, ventilation, and/or dehumidification with the general contractor as required in Division 01.

B. Coordinate construction heating gas requirements with the utility company prior to the start of construction.

C. If permanent HVAC units are to be operated prior to substantial completion, the mechanical contractor shall take steps as necessary to prevent construction dust and debris from entering the HVAC system and preserve the manufacturer’s warranty.
   1. The general and mechanical contractors shall receive permission from the owner and architect in writing prior to operating the permanent HVAC equipment.
   2. At no point shall the permanent HVAC system be in operation during installation and sanding of drywall, grinding of floors, or any other construction activities that generate dust.
      a. For existing systems that serve other spaces that must remain active, close off all supply, return, and exhaust grilles/diffusers in the space where dust-generating activities are taking place. Only after the dust has settled and the affected space has been cleaned can grilles/diffusers be put back into service.
   3. Install temporary filters with a minimum efficiency of MERV 8 on all return and/or exhaust grilles and louvers. Check filters on a weekly basis and replace as necessary and as directed by the owner or architect.
   4. Install temporary MERV 8 filters in all air handling equipment. Check filters on a weekly basis and replace as necessary and as directed by the owner or architect. Replace all filters after substantial completion with new filters.
   5. This contractor shall be responsible for any maintenance or warranty items prior to substantial completion if equipment is used for temporary space conditioning.

1.12 CUTTING AND PATCHING

A. This contractor shall do all cutting and patching necessary for the installation of their work in all existing and new buildings unless otherwise noted.

B. This contractor shall arrange for openings in the building as required for the installation of equipment furnished under this contract. Where ductwork and piping must be extended or changed, patching with concrete will be done in the building. Patching shall be at both the top and bottom of sleeves where above grade.

C. In areas where the integrity of new or existing fire separation assembly/wall is compromised by the work, contractor shall be responsible to patch and/or seal openings as necessary to maintain/return fire separation to rating as required by applicable codes.

D. This contractor shall do all cutting and patching required for their work beyond the remodeled areas unless otherwise noted. All finish work shall include patching to match existing adjacent surfaces. Painting shall be by others.

1.13 CLEANING AND RUBBISH

A. The Contractor shall coordinate with the owner special cleaning requirements and acceptable routes for transporting building material and rubbish removal.

B. Hazardous waste shall not be disposed of using sanitary or storm drains, or owner’s waste disposal facilities. Hazardous waste shall be removed from the project site and lawfully disposed of at the contractor's expense.

C. Daily Requirements:
   1. The Contractor shall maintain the work area each day to prevent hazardous accumulation of waste from the work site.
   2. At the end of each working day, the contractor shall remove all their debris, rubbish, tools, and surplus materials from the project work area. The work area shall appear broom clean and left in a neat and orderly condition. The contractor for the removal of debris from the project shall not use the owner’s waste disposal facilities.
   3. All equipment shall be cleaned, and the premises left in excellent condition, free of dirt, debris, dust, grease, oil.

D. End of Project Requirements:
   1. The Contractor, upon completion of their work, shall remove all rubbish and debris resulting from their operation and shall remove it from site at their own expense.
   2. At the end of construction, all equipment and surfaces in the project area shall be left in a clean condition. Except for protective coatings and surfaces, equipment shall be cleaned to be free of dirt, dust, debris, oil, and grease. Fingerprints, palmprints, and footprints shall be cleaned from visible surfaces. Equipment rooms shall have surfaces cleaned, floor shall be broom clean and mopped. Spaces that are to be occupied within the work area shall have all surfaces dusted, cleaned, and disinfected. Floors shall be vacuum cleaned and mopped (if applicable).

1.14 SEALING AND PENETRATION

A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.

B. This contractor shall verify rating and location of all such construction with the architectural drawings and seal all penetrations.

C. Manufacturer offering products to comply with the requirements include the following:
   1. Dow Corning "Silicone RTV Foam"
   2. 3-M Corporation "Fire Barrier Caulk and Putty"
   3. Thomas & Betts "Flame Safe Fire Stop System"

D. Installation of these products to be in strict accordance with manufacturer's recommendations and architectural specification sections or equivalent fire stopping architectural specification section.

E. This contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.15 PENETRATION PROTECTION FOR ICC 500 STORM SHELTERS

A. This contractor shall provide two-point deflection protection for all penetrations through ICC 500 Storm Shelter envelopes. Penetrations through safe room envelopes larger than 3.5 square inches (rectangular) or 2.5” diameter (circular) shall have impact protection systems capable of resisting 250+ mph impacts per ICC 500 Section 306. Systems shall be 3rd party tested per ICC 500 Chapter 8.

B. Approved wall/roof shrouds:
   1. Manufacturers:
      a. Roof Penetration Housings (RPH) #CWS
      b. Engineer approved equal
   2. Description: Two-point deflection shroud with removable cover for roof or wall mounting to protect storm shelter envelope penetrations for ductwork, piping, conduit, cabling, etc.
   3. Sizing: Size per outside diameter of duct, piping, conduit, cable, etc (including insulation). Numerous penetrations may occur within a single shroud. Coordinate with other trades for bunched penetrations.
   4. Material: Steel, 3/16”, painted
   5. Testing: Shrouds shall be 3rd Party Tested to meet ICC-500 impact rating to 250+ mph. Testing shall be in accord with ICC 500 Chapter 8.

1.16 ELECTRICAL CONNECTIONS

A. This contractor shall turn over all magnetic starters, thermal protective switches, and speed changing switches furnished under this contract for all motor driven equipment to the electrical contractor who will install such starters and switches and wire them to their respective motors as a part of the electrical contract.

1.17 UTILITY COMPANY

A. Any fees by the utility company are to be billed directly to the owner.

B. The contractor is required to assist the owner in the preparation of all utility company rebate forms that deal with equipment furnished and/or installed as a part of this contractor.

1.18 HAZARDOUS MATERIALS

A. If the contractor stores any hazardous solvents or other materials on the site, they shall obtain copies of the safety data sheets for the materials and post them on the site. The contractor shall inform the owner and all employed of any potential exposure to this material.

B. At no time shall any product containing asbestos be incorporated into the work.
   1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.19 RECORD DRAWINGS

A. This contractor shall provide at the conclusion of the project one clean, non-torn, neat, and legible "as-built" set of drawings to the owner. These drawings shall show the routing of pipes, ductwork and equipment drawn in at scaled locations. All dimensions indicated shall be referenced to a column line. A set of construction blue prints will be furnished for this work.

B. All mechanical systems installed shall be shown on the "as-built" drawings. This includes all addendum items and change orders.

C. Refer to respective architectural specification section for additional information.

D. This contractor shall update these drawings during the project at least every week.

1.20 REVIEW OF MATERIALS

A. This contractor shall submit to the engineer for review one (1) electronic copy giving a complete list of materials and equipment they propose to furnish. The brochure shall contain complete information as to the make of equipment, type, size, capacities, dimensions and illustration. One of these returned copies shall be kept on the job at all times.

B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless the contractor notifies engineer in writing of such deviation at time such drawings are furnished.

C. All submittals shall have the date marked on them when the contractor receives them from the supplier. Submittals shall be submitted through the contractor and shall not come direct from the supplier to the architect or engineer.

D. This contractor shall mark the date and sign each set that they have checked each of them in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted, or checked and will be marked "resubmit" and sent back to the contractor.

1.21 TEST OF SYSTEMS

A. This contractor, before concealed, shall test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.

B. This contractor shall be held responsible for all damage resulting from defects in the system.

C. At the conclusion of construction (before any covering up, painting or finishing) each element of the system shall be thoroughly tested against leakage, with appropriate pressure tests, as outlined herein and in appropriate sections of the specifications. All testing shall be hydrostatic unless permission is granted otherwise.
   1. Water: 100 psi maintained 8 hours
   2. Under Floor Pipes: 200 psi maintained 8 hours

D. Fluid lines other than the above 1.5 times operating with a minimum pressure of 60 psig.

E. After completion of installation, the systems shall be given tests under full operating conditions and pressures and all adjustments shall be made to make the system operative as required. All safety devices shall be tested for correct operation.

1.22 SCOPE OF WORK

A. All work shall be performed by well-qualified and licensed mechanics with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their mechanics are familiar with all the various codes and tests applicable to this work.

B. All equipment shall be new and of the type as specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

C. The intent of the drawings and specifications is for complete installation of the systems outlined in the drawings and specifications so that at the conclusion of construction the system will be turned over to the owner complete and ready for safe and efficient operation.

D. This contractor shall be required to furnish and install all such items normally included on systems of this type, which, while not mentioned directly herein or on the drawings are obviously essential to the installation and operation of the system and which are normally furnished on quality installation of this type. The drawings and specifications cannot deal individually with the many minute items that may be required by the nature of the systems.

E. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer's attention and an addendum is issued for clarification.

F. The HVAC Contractor shall establish system elevations prior to fabrication and installation. The HVAC Contractor shall coordinate elevations with other trades. All elevations shall be coordinated with all trades in the field prior to installation. When a conflict between trades arises, the design team shall be notified immediately prior to further installation however priority shall be as follows:
   1. Lighting Fixtures
   2. Gravity flow piping, including steam and condensate
   3. Electrical bus duct
   4. Sheet metal
   5. Cable trays, including access space
   6. Other piping
   7. Conduits and wireway

1.23 VERIFICATION OF ELEVATION OF EXISTING LINES

A. This contractor shall before starting any new work, verify the elevations of all existing piping to which they must connect under this contract. The contractor shall report any discrepancies between drawing elevations and actual elevations to the engineer before proceeding with the work. Failure of the contractor to do so shall make them liable for the cost of extra work involved.

1.24 WELDING PERMIT

A. Form titled "Permit For Cutting and Welding With Portable, Gas or Arch Equipment" must be completed and returned to the hospitals designated representative prior to work commencing. The owner, upon request, will supply this form.

1.25 CLEANING OF MECHANICAL SYSTEMS

A. This contractor shall thoroughly clean all rust, grease, plaster, cement, etc., from all equipment, ductwork and piping furnished and installed by them as required to leave surfaces suitable for finish painting.

B. This contractor shall keep all pipes, ducts, etc., plugged, drained or otherwise protected during construction. All items of mechanical equipment shall be suitably protected and upon completion of project shall be equal to new condition.

1.26 TRENCHING AND BACKFILLING

A. Each contractor is responsible for their own individual trenching and backfilling unless otherwise noted in the drawings or addendum.

B. Prior to digging, all underground utilities, piping, etc shall be exactly located and marked. This contractor shall be held responsible for all damages caused by failure to do so.

C. Any backfill shall be tamped and compacted to prevent future settling. The backfill shall be installed to a smooth and level grade and installed in accordance with local codes.

D. All excess dirt shall be cleared from the area and disposed of as directed by the owner.

E. Refer to architectural specification sections for additional requirements.

1.27 INFECTION CONTROL PROCEDURES

A. This contractor is instructed to adhere to the owner's procedures for infection control. Refer to owner's policy handbook for specifics.

B. This contractor is responsible for dust partitions outside of the construction areas.

C. This contractor shall schedule all work affecting the owner's use of areas outside of the construction area during evening hours.

1.28 ALTERNATES

A. Refer to General Specification Sections for alternate bid description.

1.29 DIGITAL MEDIA AGREEMENT

A. Computer Aided Drafting (CAD) documents may be available to the contractor for some uses. Contact the engineer prior to bidding to determine what information is available to be transmitted to the contractor in digital form.

B. When documents are determined to be available, and as requested by the contractor, they will be transmitted upon the completion and execution of the MODUS digital media agreement. A service fee for each document transmitted will be assessed to the contractor. Documents will be transmitted upon payment receipt. Current service fee is $100.00 per CAD sheet.

1.30 SECURE NETWORKABLE DEVICES

A. Update network devices to the most current software/firmware.

B. Change default password of all networkable devices.
   1. Passwords shall have at least eight characters.
   2. Include uppercase and lowercase letters, numerals, and special characters

C. Supply MAC address and serial number of all networkable devices.

D. Work with the Owner's IT department to align to existing IT standards.

E. Provide to the owner a printed and/or electronic spreadsheet log of all network information including, IP addresses, MAC addresses, logins and password information during system training.

1.31 SYSTEM CONFIGURATION AND PROGRAMMING FILES

A. Supply system configuration and programming files where export is available.

B. Supply uncompiled programming for systems applicable.

C. All configuration and programming shall be property of the owner at conclusion of the project.

1.32 SMOKE CONTROL AND STAIRWELL PRESSURIZATION SYSTEMS

A. All low voltage wiring associated shall be installed in continuous raceway.

B. All line voltage wiring associated shall be installed within 2-hour fire-rated systems or be 2-hour fire-rated cable.

1.33 COMMISSIONING REQUIREMENTS

A. The owner will contract directly with a commissioning authority for this project.

B. Contractor and their subcontractors and vendors shall assign representatives with expertise and authority to act on their behalf and schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
   1. Construction Phase:
      a. Facilitate the coordination of the commissioning and incorporate commissioning activities (the Commissioning Plan) into the Overall Project Schedule (OPS).
      b. Provide detailed startup procedures.
      c. Ensure that all subcontractors and vendors execute their commissioning responsibilities according to the contract documents and the OPS.
      d. Provide copies of all submittals as required in Section 01300 including all changes thereto. Attend and participate in commissioning team meetings.
      e. No later than 60 days prior to startup of the first piece of major equipment, meet with the CxA, CM, A/E, and PM and owner to finalize the detailed commissioning procedures/ schedule.
      f. Provide the training of owner personnel.
      g. Review and accept construction checklists provided by the commissioning authority.

h. Complete paper construction checklists as work is completed and provide to the commissioning authority.
i. Accomplish commissioning process test procedures.
j. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
k. Cooperate with the CxA for resolution of issues recorded in the “Issues Log”.
l. Prepare O & M manuals, according to the contract documents, including clarifying and updating the original sequences of operation to as-built/as-tested conditions.

2. Occupancy and Operations Phase
   a. Ensure that subcontractors provide assistance for seasonal or deferred performance testing, performed by the CxA, according to the specifications.
   b. Ensure that subcontractors correct deficiencies and make necessary adjustments to O & M manuals and as-built drawings for applicable issues identified in any seasonal testing.
   c. Perform all guarantee work for materials furnished under the contract for the time specified in the contract, including all warranties and curing all latent defects within the time period provided in the contract.

C. Vendors / Subcontractors
1. Provide all requested submittal data, including detailed startup procedures and specific responsibilities of the owner to keep warranties in force.
2. Assist in equipment testing per agreements with subcontractors and/or contractor.
3. Include cost of all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing, operating, and maintaining equipment according to these contract documents in the base bid price to the contractor.
4. Analyze specified products and verify that the A/E has specified the newest, most current equipment reasonable for this project's scope and budget.
5. Provide requested information regarding equipment sequence of operation and testing procedures.
6. Review construction checklists and test procedures for equipment installed by factory representatives.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

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SECTION 23 00 90
MINOR HVAC DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements of the Contract Forms, the Conditions of the Contract, Division 1 - General Requirements and Specification Section 23 00 50 - Basic Mechanical Requirements "General Provisions" apply to this section.

1.02 SCOPE

A. This contractor shall be responsible for the demolition and removal of all existing mechanical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.

B. Preserve services to the existing facility. Extend, reroute, and reconnect existing systems as required providing for the continued function of these systems.

C. This contractor shall be responsible for the cutting and capping of all existing gas, water, sewer, and any other utility service.

D. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

E. This contractor shall remove all abandon equipment, piping, ductwork, supports, equipment curbs, and bases associated with the remodeled areas unless noted otherwise.

F. This contractor is responsible to provide temporary HVAC protection during this project.

1.03 MATERIALS

A. All elements to be removed are subject to the Owner's Right of Salvage.

B. All materials removed shall be the property of the removing contractor and shall be removed from the site by them, unless otherwise specified.

C. The owner may designate and have salvage rights to any material herein demolished by this contractor. The contractor shall coordinate with the owner prior to start of demolition.

1.04 WORK BY OTHERS

A. Unless specifically noted under other contracts, this mechanical contractor shall assume they will perform all required work. In general, the following will be performed by others:
   1. The electrical contractor will disconnect all electrical service and remove conduit back to behind finished surfaces, close and cap ends of conduits.

1.05 EXISTING CONDITIONS

A. If any piping serving existing fixtures or equipment (that are to remain) are disturbed by operations under this contract, this contractor shall provide pipe and insulation required to re-establish continuity of such piping systems.

B. This contractor shall arrange for the general contractor to repair and patch all construction with material necessary to match surrounding due to the removal of equipment, piping, and ductwork.

C. This contractor shall furnish all required labor and material, where required, to extend new work to connect to similar work for extension of existing systems.

D. Demolition drawings are based on casual field observation and existing record documents. Report discrepancies to the owner before disturbing existing installation. Beginning of demolition means installer accepts existing conditions.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 23 05 13
COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Common requirements for electric motors furnished on equipment specified in other sections, including single phase and three phase electric motors.

1.02 REFERENCES

A. AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings

B. AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings

C. IEEE 112 - Test Procedure for Polyphase Induction Motors and Generators

D. NEMA MG 1 - Motors and Generators

E. NFPA 70 - National Electrical Code

F. UL 674 - UL Standard for Safety Electric Motors and Generators for Use in Division 1 Hazardous (Classified) Locations

G. UL 1836 - UL Standard for Safety Electric Motors for Use in Class I, Division 2 and Class II, Division 2 Hazardous (Classified) Locations

1.03 SUBMITTALS

A. Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.

B. Test Reports: Indicate test results verifying nominal efficiency and power factor for three phase motors larger than 1/2 horsepower.

C. Manufacturer's Installation Instructions: Indicate setting, mechanical connections, lubrication and wiring instructions.

1.04 OPERATION AND MAINTENANCE DATA

A. Operation Data: Include instructions for safe operating procedures.

B. Maintenance Data: Include assembly drawings, bearing data including replacement sizes and lubrication instructions.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacture of electric motors for use and their accessories with three years of documented product development, testing and manufacturing experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to UL Component Recognition for appropriate sizes.

B. Conform to NFPA 70 and local energy code.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products to site.

B. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weatherproof covering. Remove motors from equipment and store separately extended outdoor storage.

1.08 WARRANTY

A. Provide a three year manufacturer warranty for motors larger than one horsepower.

PART 2 PRODUCTS

2.01 ELECTRIC MOTORS MANUFACTURERS

A. General Electric

B. Reliance

C. Marathon

D. Baldor

E. Engineer approved equal.

2.02 GENERAL CONSTRUCTION AND REQUIREMENTS

A. Equipment manufacturer's standard need not conform to these specifications if motors are less than 250 watts for intermittent service.

B. Single Phase Motors: PSC where available.

C. Electrical Service: Refer to drawings for required electrical characteristics.

D. Open drip-proof type except where specifically noted otherwise.

E. Design for continuous operation in 40 deg C environment.

F. Design for temperature rise in accordance with NEMA MG1 limits for insulation class, service factor, and motor enclosure type.

G. Explosion-Proof Motors: UL approved and labeled for hazard classification with over temperature protection.

H. Visible Nameplate: Indicating manufacturer's name and model number, motor horsepower, RPM, frame size, voltage, phase, cycles, full load amps, insulation system class, service factor, maximum ambient temperature, temperature rise at rated horsepower, and minimum efficiency.

I. Wiring Terminations:
   1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
   2. Provide threaded conduit connection in end frame fractional horsepower motors where connection is made directly.

2.03 SINGLE PHASE POWER - SPLIT PHASE MOTORS

A. Starting Torque: Less than 150% of full load torque.

B. Starting Current: Up to seven times full load current.

C. Breakdown Torque: Approximately 200% of full load torque.

D. Drip-Proof Enclosure: Class A (50 deg C temperature rise) insulation, NEMA Service Factor, pre-lubricated sleeve or ball bearings.

E. Enclosed Motors: Class A (50 deg C temperature rise) insulation, 1.0 Service Factor, pre-lubricated ball bearings.

2.04 SINGLE PHASE POWER - PERMANENT SPLIT CAPACITOR MOTORS

A. Starting Torque: Exceeding one fourth of full load torque.

B. Starting Current: Up to six times full load current.

C. Multiple Speed: Through taped windings.

D. Open Drip-Proof Class A (50 deg C temperature rise) insulation, minimum 1.0 service factor, pre-lubricated sleeve or ball bearings, automatic reset overload protector.

2.05 SINGLE PHASE POWER - CAPACITOR START MOTORS

A. Starting Torque: Three times full load torque.

B. Starting Current: Less than five times full load current.

C. Pull-Up Torque: Up to 350% of full load torque.

D. Breakdown Torque: Approximately 250% of full load torque.

E. Motors: Capacitor in series with start winding. Provide capacitor start/capacitor run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.

F. Drip-Proof Enclosure: Class A insulation, NEMA service factor, pre-lubricated sleeve bearings.

G. Enclosed Motors: Class A insulation, 1.0 service factor, pre-lubricated ball bearings.

2.06 THREE PHASE POWER - SQUIRREL CAGE MOTORS

A. Starting Torque: Between 1 and 1-1/2 times full load torque.

B. Starting Current: Six times full load current.

C. Power Output, Locked Rotor Torque, Breakdown or Pull Out Torque: NEMA Design B characteristics.

D. Design, Construction, Testing and Performance: Conform to NEMA MG 1 for Design B motors.

E. Insulation System: NEMA Class B or better.

F. Testing Procedure in accordance with IEEE 112. Load test motors to determine free from electrical or mechanical defects in compliance with performance data.

G. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.

H. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid-state control relay for wiring into motor starter.

I. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum AFBMA 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt centerline at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.

J. Sound power levels to NEMA MG 1.

K. Part Winding Start Where Indicated: Use part of winding to reduce locked rotor starting current to approximately 60% of full winding locked rotor current while providing approximately 50% of full winding locked rotor torque.

L. Weatherproof Epoxy Sealed Motors: Epoxy seal windings using vacuum and pressure with rotor and starter surfaces protected with epoxy enamel; bearings double shielded with waterproof non-washing grease.

M. Nominal Efficiency: As scheduled at full load and rated voltage when tested in accordance with IEEE 112.

2.07 AC MAGNETIC MOTOR STARTERS

A. Motor starters for mechanical equipment shall be furnished and installed by the electrical contractor unless otherwise noted.

B. The mechanical contractor shall supply the electrical contractor with a schedule of equipment with voltage and horsepower, requiring motor starters.

PART 3 EXECUTION

3.01 APPLICATION

A. Single phase motors for shaft mounted fans, split phase type.

B. Single phase motors for shaft-mounted fans or blowers, permanent split capacitor type.

C. Single phase motors for fans, capacitor start type.

D. Single phase motors for fans, capacitor start, and capacitor run type.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.

C. Check the line voltage and phase. Ensure agreement with nameplate.

D. All motors over 2 hp and 3-phase shall be supplied with a power factor correction capacitor. These capacitors shall be connected to the motor side of the motor starter. The over loads shall be sized to compensate for the reduced current and still properly protect the motor. The capacitors shall correct to the full load power factory to 0.95 or better.

3.03 SCHEDULE

A. **NEMA OPEN MOTOR SERVICE FACTOR**

3600 RPM	1800 RPM	1200 RPM	900 RPM
1/6 -1/3	1.35	1.35	1.35
1/2	1.25	1.25	1.15
1.25	1.25	1.15	1.15
1.25	1.15	1.15	1.15
1.5-150	1.15	1.15	1.15

1.

3.04 THREE PHASE - ENERGY EFFICIENT, OPEN DRIP-PROOF

HP	RPM (SYN)	FRAME	STANDARD MINIMUM % EFFICIENCY	PREMIUM MINIMUM % FACTOR	MINIMUM % POWER FACTOR
1	1200	145T	80.0	82.5	72
1.5	1200	182T	84.0	86.5	73
2	1200	184T	85.5	87.5	75
3	1200	213T	86.5	88.5	60
5	1200	215T	87.5	89.5	65
7.5	1200	254T	88.5	90.2	73
10	1200	256T	89.5	91.7	74
15	1200	284T	90.2	91.7	77
20	1200	286T	91.0	92.4	78
25	1200	324T	91.7	93.0	74
30	1200	326T	92.4	93.6	78
40	1200	364T	93.0	94.1	77
50	1200	365T	93.0	94.1	79
60	1200	404T	93.6	94.5	82
75	1200	405T	93.6	94.5	80
100	1200	444T	94.1	95.0	80
125	1200	444T	94.1	95.0	84
1	1800	143T	82.5	85.5	84
1.5	1800	145T	84.0	86.5	85
2	1800	145T	84.0	86.5	85
3	1800	182T	86.5	89.5	86
5	1800	184T	87.5	89.5	87
7.5	1800	213T	88.5	91.0	86
10	1800	215T	89.5	91.7	85
15	1800	256T	91.0	93.0	85
20	1800	256T	91.0	93.0	86
25	1800	284T	91.7	93.6	85

30	1800	286T	82.4	94.1	88
40	1800	324T	93.0	94.1	83
50	1800	326T	93.0	94.5	85
60	1800	364T	93.6	95.0	88
75	1800	365T	94.1	95.0	88
100	1800	404T	94.1	95.4	83
125	1800	405T	94.5	95.4	86
150	1800	444T	95.0	95.8	85
200	1800	445T	95.0	95.8	85
1.5	3600	143T	82.5	84.0	85
2	3600	145T	84.0	85.5	87
3	3600	145T	84.0	85.5	85
5	3600	182T	85.5	86.5	86
7.5	3600	184T	87.5	88.5	88
10	3600	213T	88.5	89.5	86
15	3600	215T	89.5	90.2	89
20	3600	254T	90.2	91.0	89
25	3600	256T	91.0	91.7	92
30	3600	284T	91.0	91.7	91
40	3600	286T	91.7	92.4	92
50	3600	324T	92.5	93.0	89
60	3600	326T	93.0	93.6	91
75	3600	364T	93.0	93.6	88
100	3600	365T	93.0	93.6	88

3.05 THREE PHASE - ENERGY EFFICIENT, TOTALLY ENCLOSED, FAN COOLED

HP	RPM (SYN)	FRAME	STANDARD MINIMUM % EFFICIENCY	PREMIUM MINIMUM % FACTOR	MINIMUM % POWER FACTOR
1	1200	145T	80.0	82.5	72
1.5	1200	182T	85.5	87.5	65
2	1200	184T	86.5	88.5	68
3	1200	213T	87.5	89.5	63
5	1200	215T	87.5	89.5	66
7.5	1200	254T	89.5	91.0	68
10	1200	256T	89.5	91.0	75
15	1200	284T	90.2	91.7	72
20	1200	286T	90.2	91.7	76
25	1200	324T	91.7	93.0	71
30	1200	326T	91.7	93.0	79
40	1200	364T	93.0	94.1	78
50	1200	365T	93.0	94.1	81
60	1200	404T	93.6	94.5	83
75	1200	405T	93.6	94.5	80
100	1200	444T	94.1	95.0	83
125	1200	445T	94.1	95.0	85

1	1800	143T	82.5	85.5	84
1.5	1800	145T	84.0	86.5	85
2	1800	145T	84.0	86.5	85
3	1800	182T	87.5	89.5	83
5	1800	184T	87.5	89.5	83
7.5	1800	213T	89.5	91.7	85
10	1800	215T	89.5	91.7	84
15	1800	254T	91.0	92.4	86
20	1800	256T	91.0	93.0	85
25	1800	284T	92.4	93.6	84
30	1800	286T	92.4	93.6	86
40	1800	324T	93.0	94.1	83
50	1800	326T	93.0	94.5	85
60	1800	364T	93.6	95.0	87
75	1800	365T	94.1	95.4	87
100	1800	405T	94.5	95.4	86
125	1800	444T	94.5	95.4	87
150	1800	445T	95.0	95.8	88
200	1800	447T	95.0	96.2	87
1.5	3600	143T	82.5	84.0	86
2	3600	145T	84.0	85.5	87
3	3600	182T	85.5	86.5	87
5	3600	184T	87.5	88.5	88
7.5	3600	213T	88.5	89.5	86
10	3600	215T	89.5	90.2	86
15	3600	254T	90.2	91.0	91
20	3600	256T	90.2	91.0	89
25	3600	284T	91.0	91.7	92
30	3600	286T	91.0	91.7	92
40	3600	324T	91.7	92.4	91
50	3600	326T	92.4	93.0	92
60	3600	364T	93.0	93.6	93
75	3600	365T	93.0	93.6	91
100	3600	405T	93.6	94.1	92

END OF SECTION

SECTION 23 05 29
HANGERS AND SUPPORTS FOR HVAC EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Accessories
B. Flashing
C. Equipment curbs
D. Equipment bases
E. Sleeves

1.02 RELATED SECTIONS

A. Specification Section 23 23 00 - Refrigerant Piping

1.03 REFERENCES

A. ASME B31.1 - Power Piping
B. ASME B31.2 - Fuel Gas Piping
C. ASME B31.5 - Refrigeration Piping
D. ASME B31.9 - Building Services Piping
E. ASTM F708 - Design and Installation of Rigid Pipe Hangers
F. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer
G. MSS SP69 - Pipe Hangers and Supports - Selection and Application
H. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices

1.04 SUBMITTALS

A. All submitted documents shall be:
    1. Digital (scanned documents are not acceptable)
    2. Current, within last 5 years
    3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
    4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
    1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Product Data
        b. Design Data, indicating load capacity of hangers

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for support of piping.

PART 2 PRODUCTS

2.01 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded one end or continuous threaded.

2.02 FLASHING

A. Metal Flashing: 26 gauge galvanized steel.
B. Metal Counter Flashing: 22 gauge galvanized steel.
C. Flexible Flashing: 47 mil thick sheet butyl compatible with roofing.
D. Caps: Steel, 22 gauge minimum; 16 gauge at fire resistant elements.

E. Provide curbs for mechanical roof installations 14 inch minimum high above roofing surface unless noted otherwise. Flash and counterflash with sheet metal and seal watertight. Attach counter flashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.

2.03 EQUIPMENT CURBS

A. Manufacturers:
   1. ThyCurb
   2. Engineer approved equal.

B. Fabrication: Welded 18 gauge galvanized steel shell and base, mitered three inch (3") cant, variable step to match roof insulation, 1-1/2 inch thick, 3 lb/ft3 insulation, factory installed wood nailer.

2.04 EQUIPMENT BASES

A. Provide housekeeping pads of concrete, minimum four inch (4") thick and extending six inch (6") beyond supported equipment.

2.05 SLEEVES

A. Sleeves for pipes through wall below grade shall be Schedule 40, two pipe diameters larger than pipe. Seal with Linkseal.

B. Sleeves for pipes through non-fire rated floors shall be 18 gauge galvanized steel.

C. Sleeves for pipes through non-fire rated beams, walls, footings, and potentially wet floors shall be Schedule 40 steel pipe or 18 gauge galvanized steel.

D. Sleeves for pipes through fire rated and fire resistive floors and walls, and fire proofing to be a fire rated sleeve assembly including seals, UL listed.

E. Stuffing and Firestopping Insulation: Fiberglass type, non-combustible per UL tested assembly type.

F. Sealant Manufacturers:
   1. Dow Corning Silicone RTV Foam.
   2. 3-M Fire Barrier Caulk and Putty.
   3. Thomas & Betts Flame Safe Fire Stop System.
   4. Engineer approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.02 EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum four inch (4") thick and extending six inches (6") beyond all floor supported equipment.

B. Provide templates, anchor bolts and accessories for mounting and anchoring equipment.

C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.03 FLASHING

A. Provide flexible flashing and metal counter flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Provide curbs for mechanical roof installations 14 inches minimum high above roofing surface unless noted otherwise. Flash and counterflash with sheet metal; seal watertight. Attach counter flashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.

3.04 SLEEVES

A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

C. Extend sleeves through floor one inch (1") above finished floor level. Caulk sleeves.

D. Provide sleeves where piping penetrates floor, ceiling or wall fire rated assemblies. Close off space between pipe and adjacent work with fire stopping insulation and caulk.

E. Provide close fitting metal collar or escutcheon covers at both sides of penetration. Install chrome plated steel escutcheons at finished surfaces and within cabinets.

END OF SECTION

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SECTION 23 05 48
VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vibration isolation

1.02 PERFORMANCE REQUIREMENTS

A. Provide vibration isolation on motor driven equipment over 0.5 hp plus connected piping and ductwork.

B. Provide minimum static deflection of isolators for equipment as specified or scheduled on drawings.

C. Upper floor locations shall be considered critical unless otherwise indicated.

D. Use concrete inertia bases for fans having static pressure in excess of 3.5 inch water column (WC) or motors in excess of 40 hp and on base mounted pumps over 10 horsepower.

1.03 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data, including schedule of isolator type with location and load
      b. Shop Drawings
      c. Installation Instructions
      d. Manufacturer's Certificate verifying proper installation

C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Operation and Maintenance Information

D. Project Record Documents
   1. Indicate final installed locations of all hangers on a PDF floor plan

PART 2 PRODUCTS

2.01 VIBRATION ISOLATORS

A. Manufacturers:
   1. Kinetics
   2. Mason Industries
   3. Amber Booth
   4. Engineer approved equal.

B. Open Spring:
   1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
   2. Code: Color code springs for load carrying capacity.
   3. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.

4. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads and zinc chromate plated hardware.
5. Sound Pads: Size for minimum deflection of 0.05 inch meets requirements for neoprene pad isolators, type #6.
6. Isolators: Mason Industries type #SLF.

C. Restrained Spring:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
4. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads and zinc chromate plated hardware.
5. Sound Pads: Size for minimum deflection of 0.05 inch meets requirements for neoprene pad isolators, type #6.
6. Restraint: Provide heavy mounting frame and limit stops.
7. Isolators: Mason Industries type #SLR.

D. Closed Spring:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
4. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
5. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, type #6 and neoprene side stabilizers with minimum 0.25 inch clearance.
6. Isolator: Mason Industries type #CSR.

E. Restrained Closed Spring:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
4. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection between 0.3 and 0.6 of maximum deflection.
5. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, type #6 and neoprene side stabilizers with minimum 0.25 inch clearance and limit stops.
6. Isolator: Mason Industries type #CSR.

F. Spring Hanger:
1. Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
2. Code: Color code springs for load carrying capacity.
3. Springs: Minimum horizontal stiffness equal to 75% vertical stiffness with working deflection being 0.3 and 0.6 of maximum deflection.
4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators rubber hanger with threaded insert.
5. Misalignment: Capable of 20 degree hanger rod misalignment.
6. Isolator: Mason Industries type #30N.

G. Neoprene Pad:

1. Rubber or neoprene waffle pads.
    a. 50 durometer.
    b. Maximum loading 45 psi.
    c. Height of ribs shall not exceed 0.7 times width.
    d. Configuration: Single layer 3/4 inch thick waffle pads.
    e. Assembly: Mason Industries type #SW

H. Rubber Mount or Hanger:
1. Molded rubber designed for 0.5 inch deflection with threaded insert.
2. Isolator: Mason Industries type #HD.

I. Thrust Restraint: Isolator shall be Mason Industries type #WBI or #WBD.

J. Fiberglass Pads: Neoprene jacketed pre-compressed molded fiberglass.

K. Seismic Snubbers:
1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
2. Neoprene Elements: Replaceable, min. of 0.75 inch thick.
3. Capacity: Four times load assigned to mount groupings at 0.4 inch deflection.
4. Attachment Points and Fasteners: Capable of withstanding three times rated load capacity of seismic snubber.
5. Isolators: Mason Industries type #Z-1011.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install isolation for motor driven equipment.

C. Install spring hangers without binding.

D. Closed Spring Isolators: Adjust so side stabilizers are clear under normal operating conditions.

E. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.

F. Provide pairs of horizontal thrust restraints on fans when air thrust exceeds 10% of fan weight. Install on axial and centrifugal fans.

G. Connect wiring to isolated equipment with flexible hanging loop.

H. Housekeeping pads are by the mechanical contractor unless otherwise noted.

I. Pad mounted equipment deflection shall be .25 inches.

J. Spring mounted equipment deflection shall be two inches.

K. Refer to schedule and details on the drawings.

3.02 MANUFACTURER'S FIELD SERVICES

A. Inspect isolated equipment after installation and submit report. Include static deflections.

3.03 EQUIPMENT ISOLATION SCHEDULE

A. Refer to equipment schedules in specifications and/or on the drawings.

3.04 PIPE ISOLATION SCHEDULE

PIPE SIZES (INCHES)	ISOLATED DISTANCE FROM EQUIPMENT
1	120 diameters
2	90 diameters
3	80 diameters

4	75 diameters
6	60 diameters
8	60 diameters
10	54 diameters
12	50 diameters
16	45 diameters
24	38 diameters

END OF SECTION

SECTION 23 05 53
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates

B. Tags

C. Ceiling markers

D. Labels

E. Schedule

1.02 REFERENCES

A. ASME A13.1 - Scheme for the Identification of Piping Systems

1.03 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data, including a list of wording, symbols, letter size, and color-coding for mechanical identification.

C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

D. Project Record Documents
   1. Record actual locations of tagged valves, including valve tag numbers.

PART 2 PRODUCTS

2.01 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.02 TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.

B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

C. Information Tags: Clear plastic with printed "Danger, "Caution" or "Warning" and message; size 3-1/4" x 5-5/8" with grommet and self-locking nylon ties.

D. Tag Chart: Typewritten letter size list in anodized aluminum frame plastic laminated.

2.03 CEILING MARKERS

A. Description: Acrylic, self adhesive marker with a 3/4 inch diameter color-coded head.

B. Color Code as Follows:

1. HVAC Equipment: Yellow.
2. Fire Dampers/Smoke Dampers: Red.
3. Plumbing Valves: Green.
4. Heating/Cooling Valves: Blue.

2.04 LABELS

A. Description: Laminated vinyl, size 0.75" adhesive backed with printed identification.

PART 3 EXECUTION

3.01 PREPARATION

A. De-grease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces for stencil painting.

3.02 INSTALLATION

A. Install identifying devices after completion of coverings and painting.

B. Install plastic nameplates with corrosive-resistant mechanical fasteners or adhesive.

C. Install labels with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer. Apply paint primer before applying labels for unfinished canvas covering.

D. Install tags using corrosion resistant chain. Number tags consecutively by location.

E. Tag automatic controls, instruments, and relays. Key to control schematic.

F. Identify piping, concealed or exposed as indicated in schedule below. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure and at each obstruction. Identify on both sides of any wall.

G. Identify ductwork with air handling unit identification number and area served. Locate identification at air handling unit at each side of penetration of structure or enclosure and at each obstruction.

H. Provide color coded ceiling markers to locate valves, equipment, etc above T-bar type panel ceilings. Locate on the grid in the location closest to equipment.

I. Conform to owner's existing identification scheme. Verify with owner prior to bid.

3.03 IDENTIFICATION SCHEDULE

Component	Identification
AHUs, Heat Transfer Equipment, Tanks and Other Large Equipment	Plastic Nameplates
Pumps (1 HP and Above)	Plastic Nameplates
Pumps (Below 1 HP)	Plastic Nameplates
Air Terminal Units	Plastic Nameplates
All Valves	Tags
Control Panels and Other Major Control Components	Plastic Nameplates
Automatic Controls, Instruments, Relays	Tags
Ductwork	Duct Labels

END OF SECTION

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing, adjustment, and balancing of air systems

B. Measurement of final operating condition of HVAC systems

C. Sound measurement of equipment operating conditions

D. Vibration measurement of equipment operating conditions

1.02 REFERENCES

A. AABC - National Standards for Total System Balance

B. ADC - Test Code for Grilles, Registers, and Diffusers

C. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems

D. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems

E. SMACNA - HVAC Systems Testing, Adjusting, and Balancing

1.03 SUBMITTALS

A. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

B. Submit name of adjusting and balancing agency for approval within 30 days after award of Contract.

C. Construction submittal (prior to commencing work)
   1. Provide (1) submittal including the following.
      a. Report forms or outlines indicating adjusting, balancing, and equipment data required.
      b. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty.

D. Closeout report submittal
   1. Provide report with set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
   2. Provide final copies to Architect/Engineer and for inclusion in operating and maintenance manuals.
   3. Indicate test report data on AABC National Standards for Total System Balance Forms.

E. Project Record Documents
   1. Record actual locations of flow measuring stations, balancing valve, and rough setting.

1.04 QUALITY ASSURANCE

A. Perform total system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance.

B. Maintain one copy of each document on site.

1.05 QUALIFICATIONS

A. Independent agency specializing in the testing, adjusting and balancing of systems specified in this section with minimum three years experience.

B. Perform work under supervision of AABC Certified Test and Balance Engineer or NEBB Certified Testing, Balancing and Adjusting Supervisor.

1.06 PRE-BALANCING CONFERENCE

A. Convene a conference one week prior to commencing work of this section.

1.07 SEQUENCING

A. Sequence work to commence after completion of systems and schedule completion of work before substantial completion of project.

1.08 SCHEDULING

A. Schedule and provide assistance in final adjustment and test of life safety system with the fire authority.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.
   7. Fire, smoke, and volume dampers are in place and open.
   8. Air coil fins are cleaned and combed.
   9. Access doors are closed and duct end caps are in place.
   10. Air outlets are installed and connected.
   11. Duct system leakage is minimized.

B. Submit field reports. Report defects and deficiencies noted during performance of services that prevents system balance.

C. Beginning of work means acceptance of existing conditions.

3.02 PREPARATION

A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to the engineer to facilitate spot checks during testing.

B. Provide additional balancing devices as required.

3.03 INSTALLATION TOLERANCES

A. Air Handling Systems: Adjust to within +/- 5% of design for supply systems and +/- 10% of design for return and exhaust systems.

B. Air Outlets and Inlets: Adjust total to within + 10% and - 5% of design to space. Adjust outlets and inlets in space to within +/- 10% of design.

3.04 ADJUSTING

A. Ensure recorded data represents actual measured or observed conditions.

B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the owner.

F. Check and adjust systems approximately six months after final acceptance and submit report.

3.05 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.

B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Use volume control devices to regulate air quantities only to extent those adjustments do not create objectionable air motion or sound levels. Affect the volume control by duct internal devices (such as dampers and splitters).

F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50% loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum airflow rate, full cooling, and at minimum airflow rate, full heating.

L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inch positive static pressure.

M. Check multi-zone units for motorized damper leakage. Adjust air qualities with mixing dampers set first for cooling, then heating, and then modulating.

N. Set volume controller to airflow setting indicated for variable air volume system powered units. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

3.06 SCHEDULES

A. Equipment Requiring Testing, Adjusting, and Balancing:
   1. Sprinkler Air Compressors
   2. Electric Water Coolers
   3. Plumbing Pumps
   4. Energy Recovery Units
   5. Terminal Heat Transfer Units
   6. Air Handling Units
   7. Fans
   8. Air Terminal Units
   9. Air Inlets and Outlets

B. Report Forms
   1. Title Page:
      a. Name of Testing, Adjusting, and Balancing Agency
      b. Address of Testing, Adjusting, and Balancing Agency

c. Telephone number of Testing, Adjusting, and Balancing Agency
d. Project Name
e. Project Location
f. Project Architect
g. Project Engineer
h. Project Contractor
i. Project Altitude
j. Report Date

2. Summary Comments:
   a. Design versus final performance.
   b. Notable characteristics of system.
   c. Description of systems operation sequence.
   d. Summary of out door and exhaust flows to indicate amount of building pressurization.
   e. Nomenclature used throughout report.
   f. Test conditions.
3. Instrument List:
   a. Instrument
   b. Manufacturer
   c. Model number
   d. Serial number
   e. Range
   f. Calibration date
4. Electric Motors:
   a. Manufacturer
   b. Model/Frame
   c. HP/BHP
   d. Phase, voltage, amperage; nameplate, actual, no load
   e. RPM
   f. Service factor
   g. Starter size, rating, heater elements
   h. Sheave Make/Size/Bore
5. V-Belt Drive:
   a. Identification/location
   b. Required driven RPM
   c. Driven sheave, diameter and RPM
   d. Belt, size and quantity
   e. Motor sheave diameter and RPM
   f. Center to center distance, maximum, minimum, and actual
6. Pump Data:
   a. Identification/number
   b. Manufacturer
   c. Size/Model
   d. Impeller
   e. Service
   f. Design flow rate, pressure drop, BHP
   g. Actual flow rate, pressure drop, BHP
   h. Discharge pressure
   i. Suction pressure
   j. Total operating head pressure
   k. Shut off, discharge and suction pressures
   l. Shut off, total head pressure
7. Electric Heat Duct:

a. Manufacturer
b. Identification/Number
c. Location
d. Model number
e. Design kW
f. Number of stages
g. Phase, voltage, amperage
h. Test voltage (each phase)
i. Test amperage (each phase)
j. Air flow, specified and actual
k. Temperature rise, design and actual

8. Air Moving Equipment:
   a. Location
   b. Manufacturer
   c. Model number
   d. Serial number
   e. Arrangement/Class/Discharge
   f. Air flow, specified and actual
   g. Return air flow, specified and actual
   h. Outside air flow, specified and actual
   i. Total static pressure (total external), specified and actual
   j. Inlet pressure
   k. Discharge pressure
   l. Sheave make/size/bore
   m. Number of belts/make/size
   n. Fan RPM
9. Return Air/Outside Air Data:
   a. Identification/Location
   b. Design air flow
   c. Actual air flow
   d. Design return air flow
   e. Actual return air flow
   f. Design outside air flow
   g. Actual outside air flow
   h. Return air temperature
   i. Outside air temperature
   j. Required mixed air temperature
   k. Actual mixed air temperature
   l. Design outside/return air ratio
   m. Actual outside/return air ratio
10. Exhaust Fan Data:
    a. Location
    b. Manufacturer
    c. Model number
    d. Serial number
    e. Air flow, specified and actual
    f. Total static pressure (total external), specified and actual
    g. Inlet pressure
    h. Discharge pressure
    i. Sheave Make/Size/Bore
    j. Number of Belts/Make/Size
    k. Fan RPM

11. Duct Traverse:
    a. System zone/branch
    b. Duct size
    c. Area
    d. Design velocity
    e. Design air flow
    f. Test velocity
    g. Test air flow
    h. Duct static pressure
    i. Air temperature
    j. Air correction factor
12. Duct Leak
    a. Description of ductwork under test.
    b. Duct design operating and pressure.
    c. Duct design test static pressure.
    d. Duct capacity, air flow.
    e. Maximum allowable leakage duct capacity times leak factor
    f. Test Velocity:
        1) Blower
        2) Orifice, tube size
        3) Orifice size
        4) Calibrated
        5) Test static pressure
        6) Test orifice differential pressure
        7) Leakage
13. Air Monitoring Station Data:
    a. Identification/location
    b. System
    c. Size
    d. Area
    e. Design velocity
    f. Design air flow
    g. Test velocity
    h. Test air flow
14. Flow Measuring Station:
    a. Identification
    b. Location
    c. Size
    d. Manufacturer
    e. Model number
    f. Serial number
    g. Design flow rate
    h. Design pressure drop
    i. Actual/final pressure drop
    j. Actual/final flow rate
    k. Station calibrated setting
15. Terminal Unit Data:
    a. Manufacturer
    b. Type, constant, variable, single, dual duct
    c. Identification/number
    d. Location
    e. Model number

f. Size
g. Minimum static pressure
h. Minimum design air flow
i. Maximum design air flow
j. Maximum actual air flow
k. Inlet static pressure
l. Air temperature rise across reheat coil

16. Air Distribution Test Sheet:
    a. Air terminal number
    b. Room number/location
    c. Terminal type
    d. Terminal size
    e. Area factor
    f. Design velocity
    g. Design air flow
    h. Test (final) velocity
    i. Test (final) air flow
    j. Percent of design air flow
17. Sound Level Report:
    a. Location
    b. Octave bands - equipment off
    c. Octave bands - equipment on
18. Vibration Test:
    a. Location of points:
    b. Fan bearing, drive end
    c. Fan bearing, opposite end
    d. Motor bearing, center (if applicable)
    e. Motor bearing, drive end
    f. Casing (bottom and top)
    g. Casing (side)
    h. Duct after flexible connection (discharge)
    i. Duct after flexible connection (suction)
    j. Test Readings:
        1) Horizontal, velocity and displacement
        2) Vertical, velocity and displacement
        3) Axial, velocity and displacement
        4) Normally acceptable readings, velocity and acceleration
        5) Unusual conditions at time of test
        6) Vibration source (if non-complying)

C. This contractor shall traverse the ductwork entering and leaving the remodeled areas. At the conclusion of all phases, this contractor shall re-measure all airflows in the ducts entering and leaving the remodeled areas. Adjust the AHU fan(s) serving this area as necessary to return airflows to areas external to the remodeled areas back to pre-construction conditions.

END OF SECTION

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SECTION 23 07 13
DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass (rigid board)

B. Fiberglass (flexible duct wrap)

C. Fiberglass (duct liner)

D. Elastomeric foam (duct liner)

1.02 RELATED SECTIONS

A. Specification Section 23 31 00 - HVAC Ducts and Casings

B. Specification Section 23 33 00 - Air Duct Accessories

1.03 REFERENCES

A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

B. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

D. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation

E. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Fiberglass, Duct Lining Material)

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

G. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials

H. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

I. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

J. ASTM C612: Standard Specification for Mineral Fiber Block and Board Thermal Insulation

K. ASTM C1290: Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts

L. ASTM E2336: Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems

M. ASTM C1338: Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings

N. NAIMA National Insulation Standards

O. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials

P. SMACNA - HVAC Duct Construction Standards - Metal and Flexible

Q. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal

1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
    a. Product Data

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Applicator Qualifications: Company specializing in performing the work of this section approved by manufacturer.

1.06 REGULATORY REQUIREMENTS

A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84.

B. Identification: External duct insulation and factory insulated flexible duct shall be legibly printed or identified at intervals not greater than 36 inch with name of manufacturer, the thermal resistance R-value at the specified thickness; and the flame spread and smoke developed indexes of the composite material.

1.07 DELIVERY, STORAGE AND PROTECTION

A. Deliver, store, protect and handle products to site.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 FIBERGLASS (RIGID BOARD)

A. Manufacturers:
    1. Johns Manville Spin-Glas
    2. Owens Corning
    3. Knauff
    4. Certainteed
    5. Engineer approved equal.

B. Insulation: ASTM C612; semi-rigid board semi-rigid fiberglass boards with a thermosetting resin binder.
    1. "K" Value: ASTM C518, 0.23 at 75 deg F.
    2. Maximum Service Temperature: 450 deg F.
    3. Maximum Moisture Absorption: Less than 5% by weight.
    4. Density: 3.0 lb/cu. ft.
    5. Maximum Flame Spread/Smoke Developed Index: ASTM E84; 25/50

C. Adhesive: As recommended by the manufacturer.

D. Fasteners: Galvanized steel spot-welded PIN.

E. Vapor Barrier Jacket:
    1. All Service Jacket (ASJ): White laminated foil reinforced with fiber glass yarn. ASTM E96 permeance; 0.02 perm. Pressure sensitive tape shall match the insulation facing.

F. Exterior Vapor Barrier Jacket (Ducts exposed to outdoor conditions):
    1. Manufacturers:
        a. VentureClad 1579CW

b. Polyguard Alumagaurd
c. Engineer approved equal.
2. Self adhesive, UV resistant, flexible weather and vapor barrier cladding.
3. Material thickness: 15 mil minimum
4. Tensile strength: PSTC 131; 50 lb/in
5. Puncture resistance; ASTM D774/D1000: 80 psi
6. Water Vapor Permeance; ASTM E96; 0.0 perms
7. Tape: Multi-layered pressure sensitive tape provided by the jacket manufacturer to match jacket properties.
8. Warranty: 10 year warranty from leaks caused by defects in material or manufacturing when installed in accordance to manufacturer recommendation.

2.02 FIBERGLASS (FLEXIBLE DUCT WRAP)

A. Manufacturers:
1. Owens Corning
2. Knauff
3. Johns Manville
4. CertainTeed
5. Engineer approved equal.

B. Insulation: ASTM C1290; flexible, noncombustible blanket.
1. "K" Value: ASTM C518, 0.27 at 75 deg F.
2. Installed R-value (compressed to 25%) for 1-1/2": 4.5
3. Maximum Service Temperature: ASTM C411; 250 deg F.
4. Maximum Moisture Absorption: ASTM C1104; 5% by weight
5. Density: 1.0 lb./cu. ft. (0.75 lb/cu ft for attic insulation)
6. Microbial Growth: ASTM C1338; does not support the growth of mold, fungi and bacteria.
7. Maximum Flame Spread/Smoke Developed Index: ASTM E84; 25/50

C. Vapor Barrier Jacket:
1. Kraft paper reinforced with fiberglass yarn and bonded to aluminized film.
2. Maximum Moisture Vapor Transmission: ASTM E96; 0.02 perm.

D. Vapor Barrier Tape Pressure sensitive tape approved by the manufacturer.

2.03 FIBERGLASS (DUCT LINER)

A. Manufacturers:
1. Johns Manville Permacote Linacoustic
2. Owens Corning
3. CertainTeed Ultralite
4. Knauff
5. Engineer approved equal.

B. Insulation:
1. ASTM C1071, flexible noncombustible blanket air surface coated with acrylic coating treated with ASTM G21 and G22 anti-microbial agent to resist growth.
2. "K" Value: ASTM C518, 0.25 at 75 deg F.
3. Maximum Service Temperature: 250 deg F.
4. Maximum Velocity on Coated Air Side: 5,000 FPM
5. Noise Reduction Coefficient: 0.50 or higher in accordance with ASTM C423. (1/2" thickness)
a. Noise reduction coefficient will drive density for each manufacturer may vary by manufacturer to achieve.
6. Maximum Flame Spread/Smoke Developed Index: ASTM E84; 25/50

C. Adhesive: Adhesive: ASTM C916 adhesive as recommended by manufacturer.

D. Liner Fasteners: Galvanized steel welded with integral head.

2.04 ELASTOMERIC FOAM (DUCT LINER)

A. Manufacturers:
   1. Armacell Armaflex
   2. 2. K-Flex
   3. 3. Aeroflex
   4. 4. Engineer approved equal

B. Insulation
   1. ASTM C534/C1534 closed cell, flexible elastomeric foam with ASTM G21/G22 microbial and fungal resistant properties.
   2. "K" Value: ASTM C518; 0.25 at 75 deg F.
   3. Service temperature range: -40 to 220 deg F.
   4. Maximum allow velocity: 4,000 fpm
   5. Noise Reduction Coefficient: ASTM C423; 0.15 NRC at 1/2" thickness, 0.35 at 1" thickness
   6. Flame Spread/Smoke Development; ASTM E84; 25/50 for 2" thickness and under.

C. Adhesive: Coverage per manufacturers requirements

D. Liner Fasteners: Galvanized steel welded with integral head

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that ductwork has been tested before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed and dry.

3.02 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

B. Insulated Ductwork Conveying Air Below Ambient Temperature:
   1. Provide insulation with vapor barrier jackets.
   2. Finish with tape and vapor barrier jacket.
   3. Continue insulation through walls, sleeves, hangers and other duct penetrations.
   4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, expansion joints, reheat coils, and any other item exposed to ductwork air temperature.

C. Insulated Ductwork Conveying Air Above Ambient Temperature:
   1. Provide with standard vapor barrier jacket.
   2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

D. Exterior Ductwork Insulation Application:
   1. Secure insulation with vapor barrier with adhesive. Seal vapor barrier jacket joints with vapor barrier tape to match jacket.
   2. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging.
   3. Lift ductwork off trapeze hangers and insert spacers.
   4. Seal vapor barrier penetrations with vapor barrier adhesive and tape.
   5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

E. Duct Liner Application:
   1. Adhere insulation with adhesive for 100% coverage.
   2. Secure insulation with mechanical liner fasteners. Refer to SMACNA Standards for spacing. Pin length as required to limit compression of liner.
   3. Seal and smooth joints. Seal and coat all exposed edges.
   4. Seal liner surface penetrations with adhesive.

3.03 SCHEDULES

FIBERGLASS RIGID BOARD

DUCTWORK	THICKNESS
Supply Ducts (Mechanical Rooms)	1-1/2"
Exhaust Ducts (Mechanical Rooms)	1-1/2"
Relief Ducts (Mechanical Rooms)	1-1/2"
Outdoor Intake Ducts (Mechanical Rooms)	2"
Outdoor Air Intake Ducts (ERV)	2"
Exhaust Air Ducts (ERV)	1-1/2"
All Exterior Ducts (Located Outdoors)	3"
Louver and Relief/Intake Hood Plenums	2"

FIBERGLASS FLEXIBLE DUCT WRAP

DUCTWORK	THICKNESS
Supply Ducts	1-1/2"
Return Ducts	1-1/2"
Ductwork Exposed to Attic Space	3"
Exhaust Ducts	1-1/2"
Relief Ducts	1-1/2"
Outside Air Intake Ducts	2"
Fire, Smoke, and Fire/Smoke Damper Sleeves	1-1/2"
VAV Box Reheat Coil Section	1-1/2"

FIBERGLASS DUCT LINER

DUCTWORK	THICKNESS
Supply Ducts	1/2"
Return Ducts	1/2"
Exhaust Ducts	1/2"
Relief Ducts	1/2"
Transfer Ducts	1/2"

ELASTOMERIC FOAM DUCT LINER

DUCTWORK	THICKNESS
Supply Ducts	1/2"
Return Ducts	1/2"
Exhaust Ducts	1/2"
Relief Ducts	1/2"
Transfer Ducts	1/2"

A. Do not wrap or insulate any exposed supply, return or exhaust duct located in normally occupied areas.

END OF SECTION

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SECTION 23 07 16
HVAC EQUIPMENT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass (flexible)

1.02 RELATED SECTIONS

A. Specification Section 23 23 00 - Refrigerant Piping

1.03 REFERENCES

A. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

D. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulation Cement

E. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement

F. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

G. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation

H. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

I. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation

J. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

L. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials

M. NAIMA National Insulation Standards

N. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials

O. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Deliver, store, protect, and handle products to site.

B. Deliver materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Store insulation in original wrapping and protect from weather and construction traffic, dirt, water, chemical, and mechanical damage.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 FIBERGLASS (FLEXIBLE)

A. Insulation: ASTM C553; flexible, noncombustible.
   1. "K" Value: ASTM C177 or ASTM C518, 0.24 at 75 deg F.
   2. Maximum Service Temperature: 450 deg F.
   3. Maximum Moisture Absorption: 0.1% by volume.
   4. Density: 1.0 lb/cu. ft.

B. Vapor Barrier Jacket:
   1. Kraft paper reinforced with fiberglass yarn and bonded to aluminized film.
   2. Moisture Vapor Transmission: ASTM E96; 0.02 perm.
   3. Secure with self-sealing longitudinal laps and butt strips.
   4. Secure with outward clinch expanding staples and vapor barrier mastic.

C. Facing: Stainless steel one inch (1") hexagonal wire mesh stitched on one face of insulation.

D. Vapor Barrier Lap Adhesive: Compatible with insulation.

E. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment has been tested before applying insulation materials.

B. Verify that surfaces are clean and dry with foreign material removed.

3.02 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Do not insulate factory-insulated equipment.

C. Exposed Equipment: Locate insulation and cover seams in least visible locations.

D. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires or bands.

E. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.

F. Inserts and Shields:
   1. Application: Equipment two inch (2") diameter or larger.
   2. Shields: Galvanized steel between hangers an inserts.
   3. Insert Location: Between support shield and equipment under the finish jacket.

4. Insert Configuration: Minimum six inch (6") long of same thickness and contour as adjoining insulation. May be factory lubricated.
5. Insert Material: Poly Iso-Cyanurate.

G. Finish insulation at supports, protrusions, and interrupters.

H. Do not insulate over nameplate or ASME stamp. Bevel and seal insulation around such.

I. Install insulation for equipment requiring access for maintenance, repair or cleaning in such a manner that it can be easily removed and replaced without damage.

J. Finish insulation at supports, protrusions, and interruptions.

K. Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with canvas jacket sized for finish painting.

L. Cover fiberglass insulation with metal mesh and finish with heavy coat of insulating cement.

M. Equipment Requiring Access for Maintenance, Repair or Cleaning: Install insulation so it can be easily removed and replaced without damage.

3.03 SCHEDULE

FIBERGLASS FLEXIBLE INSULATION

EQUIPMENT	THICKNESS
Inside Rooftop Unit Curbs (For Sound Isolation)	6"

END OF SECTION

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SECTION 23 09 13
DDC INSTRUMENTS AND CONTROL DEVICES FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Input/output sensors for DDC controls

B. Thermostats and thermostat/sensor accessories

1.02 RELATED SECTIONS

A. Specification Section 23 0923 - DDC System

B. Specification Section 23 0993 - Sequence of Operation for HVAC Controls

1.03 REFERENCES

A. NFPA 70 - National Electrical Code

B. NFPA 90A - Installation of Air Conditioning and Ventilation Systems

1.04 SUBMITTALS

A. Shop Drawings:
   1. Trunk cable schematic showing Tier #1, Tier #2 and Tier #3 conductors. These schematics must show all Tier #1, Tier #2 and Tier #3 equipment and controllers added by or affected by this project, the location of each device and the location of power circuits for each device.
   2. Drawings of connected input and output points. These drawings must show the input or output device, terminal points on the input or output device, the controller that the device connects to, terminal points on the controller and intermediate connections such as terminal blocks.
   3. Drawings of location of control components, including sensors not close to their mechanical system (i.e., room temperature sensors, duct mounted sensors) and control enclosures. The locations may be shown on copies of the project's mechanical system drawings.

B. Descriptive data of operating, user and application software located at Tier #1, Tier #2 and Tier #3. If existing software affects the controls installed for this project, include descriptive data of that software.

C. Control System Components:
   1. Front and side views of enclosures with overall dimensions and conduit entrance locations.
   2. Voltage, amp draw, MOCP and MCA of the controllers and attached devices.
   3. Ambient conditions to include temperature and relative humidity allowed for storage and operation of the controllers and attached devices.
   4. Listed Marks from an OSHA nationally recognized testing laboratory that comply with the listing requirements in Specification Section 23 0923 and Specification Section 23 0993.

D. Sequence of operation that outlines the programming running in the Tier #2 Tier #3 controllers, both programmable and application specific, and shows compliance with the sequence of control published in Specification Section 23 0993 and on the construction drawings. The sequence may be presented in a narrative or flow chart format.

E. Closeout:
   1. Record actual location of control components, including sensors not close to their mechanical system (i.e., room temperature sensors, duct mounted sensors) and control enclosures. Show these locations on marked up project mechanical system drawings and / or the shop drawings.
   2. Revise shop drawings to reflect the as installed system and the final sequences of operation.

3. Routine preventative maintenance schedule that follows NEMA ICS 1.3 - Preventative Maintenance of Industrial Control and Systems Equipment. Include instructions for operating controllers and describe the operating limits that must be maintained to prevent hazardous or unsafe conditions.
4. Provide manufacturers' warranties in writing. All equipment provided or furnished by the FMS contractor must be warranted as required in the project specification. Make out the warranties in owner's name and register with the equipment's manufacturer.

1.05 QUALITY ASSURANCE

A. The installer must be a company specializing in applying the work of this section with a minimum of five years experience. The installer may be a subcontractor with the minimum five years experience with their work overseen and directed by the Facility Management System (FMS) contractor.

B. Any electrician installing electrical circuits must be licensed in Iowa as a Class A or Class B Master Electrician or must be licensed in Iowa as a Class A or B Journeyman Electrician and be employed either by an Iowa recognized electrical contractor or an Iowa licensed Class A or Class B Master Electrician. This licensing requirement does not apply to the installation of class two or class three remote control circuits, signaling circuits, power limited circuits, optical fiber cables, other cabling or communications circuits, including raceways, as defined by NFPA 70 for voice, video, audio and data circuits. Refer to Iowa Code Section 103.

1.06 REGULATORY REQUIREMENTS

A. Electrical installation to conform to requirements of NFPA 70.

B. Products must be listed and classified by Underwriters Laboratories, Inc. (UL) or ETL as suitable for the purpose specified and indicated.

C. All electrical work must be inspected in accordance with Iowa law. The inspection must be conducted by a state licensed inspector or the inspector of a political subdivision that Iowa State law recognizes as allowed to conduct inspections inside that subdivision. This inspection requirement does not apply to the installation of class two or class three remote control circuits, signaling circuits, power limited circuits, optical fiber cables, other cabling or communications circuits, including raceways, as defined by NFPA 70 for voice, video, audio and data circuits. Refer to Iowa Code Section 103.

1.07 WARRANTY

A. Warranty must be one-year parts and labor unless noted otherwise for specific components. Warranty starts when the FMS Tier #1 software is operating; all required graphics are installed, fully active and displaying the input and output points, access to the internet is established, the Tier #2 hardware is operating, the Tier #3 hardware is operating, the Tier #2 and Tier #3 databases are stored on the Tier #1 mass storage device and the owner has taken beneficial occupancy of the building.

B. All warranty service must be conducted by a technician employed by the FMS contractor except that problems specific to installation by a subcontractor may be resolved by that subcontractor.

1.08 MAINTENANCE SERVICE

A. No regular maintenance of the control system is required after the warranty starts.

B. Submit a written report to the owner after any warranty call. The report must state the reason for the warranty call, the FMS contractor's technicians diagnosis and any hardware or software repair or replacement required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Instruments and control devices specified below may be made by the FMS manufacturer or may be third party OEM equipment cataloged by the FMS manufacturer that meets the specification requirements. All third party OEM devices must be warranted the same as

devices manufactured by the approved FMS manufacturers and those warranties; both labor and material, must be executed by the FMS contractor.

1. Johnson Controls, Inc.
2. Siemens Industries
3. Trane Company
4. Schneider Electric
5. Honeywell
6. Distech
7. Automated Logic
8. Minco
9. BAPI
10. Dwyer
11. Veris
12. ACI
13. Belimo Air Control
14. Apollo
15. Bray
16. Fisher
17. Tyco/Keystone
18. Griswold
19. Danfoss
20. Flow Control Industries
21. Ruskin
22. Tamco
23. Honeywell Analytics
24. MSA
25. Setra
26. Rosemont
27. Endress + Hauser
28. Gerand Engineering
29. Onicon
30. Badger
31. Ebtron
32. Air Monitor
33. Engineer approved equal.

B. This is a list of allowed manufacturers of end devices, both input (i.e. sensors) and output (i.e. actuators, valves, dampers). Inclusion of this list does not allow that manufacturer to bid the FMS System as the FMS contractor. The qualifications of the FMS contractor are established in Specification Section 23 0923 - Direct Digital Control Systems for HVAC.

2.02 INPUT/OUTPUT SENSORS FOR DDC CONTROL

A. Temperature Sensors and Transmitters:

1. Temperature sensors used for measuring room temperature and mounted on a wall or ceiling or installed in a return duct must have a +/- 0.5 F accuracy over a range of 55F to 95F. The sensor accuracy requirement applies to sensors that are connected to a Tier 2 or Tier 3 controller or sensors that are part of a thermostat. Room temperature sensors may be thermistor or RTD.
2. Temperature sensors used to measure the discharge air temperature from an air valve, unit heater, fan coil unit, unit ventilator or duct mounted reheat coil must have a +/- 0.75F accuracy over a range of 20F to 120F. These temperature sensors may be thermistor or RTD. A duct mounted temperature sensor assembly must include a gasket to prevent air leakage. The temperature sensor may connect directly to a Tier 2 or Tier 3 controller or

may connect to a temperature transmitter that in turn connects to a Tier 2 or Tier 3 controller.

3. FMS contractor furnished or provided temperature sensors used for duct, air processing machine, immersion or outside air measurement other than to measure an air valve, unit heater, fan coil unit, unit ventilator or duct mounted reheat coil discharge temperature, may use a thermistor or RTD. Single point sensors must have an accuracy of +/- 0.36F or better in the range of 20F to 120F. Averaging sensors must have an accuracy of +/- 0.5F or better in the range of 20F to 120F.
    a. An air processing machine is a packaged air handler, modular air handler, field built air handler, energy recovery ventilator, standalone preheat coil assembly or stand alone fan.
    b. Duct or air processing machine temperature sensors include single point or averaging element sensors listed on the point list in the sequence of operation or on the control system drawings that are used to sense discharge air temperature from an air processing machine, discharge temperature from any coil inside an air processing machine, entering air temperature into any coil inside an air processing machine, mixed air temperature associated with an air processing machine or air temperature entering an air processing machine.
    c. Use single point temperature sensors in ducts or air processing machine locations that are 10 square feet or smaller and not used to measure mixed air temperature.
    d. Use averaging elements for locations required in a point list or that are larger than 10 square feet or used to measure mixed air temperature, regardless of duct area. Use averaging elements that are at least 24 inches long at locations with up to 5 square feet of cross sectional area. Use averaging elements that are at least 48 inches long at locations with between 5 and 10 square feet of cross sectional area. Use averaging elements with a length of at least 96 inches long at locations with between 10 and 15 square feet of cross sectional area. Use averaging elements with a length of at least 96 inches long plus additional 12 inch increments for each square foot increment of cross sectional area above 15 square feet (i.e., a cross sectional area of 16 square feet requires a 108 inch long element. A cross sectional area of 20 square feet requires a 154 inch long element.). Multiple averaging bulb sensors may be used at a particular location to meet the bulb length requirement. Averaging sensors that are up to 48-inches long may be rigid or bendable. Averaging sensors longer than 48-inches long must be bendable.
    e. Single point and averaging temperature sensor assemblies must include a junction box with a gasket to prevent leakage and reduce vibration noise.
    f. Temperature sensors used for outside air temperature measurement be in a NEMA 4 watertight fitting or enclosure and shielded from the direct rays of the sun at all times.

B. Gas Sensors:
    1. CO2 Sensors:
        a. The room and duct mount CO2 sensors must have a detection range of 0 - 2,000 ppm with linear output and be accurate within 100 ppm across the span.
        b. The sensing technology must be infrared and the sensor must have an expected lifetime of at least ten years.
        c. Place duct sensors in an appropriate enclosure as required by the manufacturer.

C. Equipment Operation Sensors:
    1. Sense fan on/off status with adjustable threshold current sensors sized for the fan motors full load current draw on one horse power and larger motors. Use on/off current sensors for smaller motors.
    2. Sense the run status of any other electric motor with adjustable threshold current sensors sized for the motors full load current draw on one horse power and larger motors. Use on / off current sensors for smaller motors.
    3. Use ECM specific current sensors for ECMs.

2.03 THERMOSTATS AND THERMOSTAT/SENSOR ACCESSORIES

A. Room Thermostat and Sensor Accessories:
   1. Any thermostat or sensor located on an exterior wall or an interior wall adjacent to an interior space that is not maintained at a similar temperature during the winter (i.e., a sometimes heated garage) must have an insulating base.
   2. Any temperature sensor indicated to be flush mount must be a stainless steel plate with the sensor attached and thermally bridged to the back of the plate.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify that systems are ready to receive work.

B. Beginning of installation means installer accepts existing conditions.

C. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.

D. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

E. Ensure installation components are complementary to installation of similar components.

F. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

G. Do not install control instruments, including controllers, until building environment can be maintained within the operating conditions required by the manufacturer.

H. Verify that field measurements are as indicated on shop drawings and instructed by manufacturer.

3.02 INSTALLATION

A. Install all devices in accordance with manufacturer's instructions.

B. Check and verify location of thermostats and other exposed control sensors with plans and room details before installation. Align with lighting switches.

C. Mount long bulb duct thermostats and temperature sensors using flanges and element holders.

D. Mount all outside sensor's transmitters indoors and place the outside located elements under a sun shield.

E. Any thermostat or sensor mounted in a gym, fitness center, corridor, locker room, shower room, public restroom or cafeteria must have a metal guard mounted on a separate base. Any guard in a locker or shower room must have a rust resistant finish such as stainless steel construction or an epoxy or powder coat finish.

F. Mount control panels adjacent to associated equipment on vibration free walls or free standing angle iron supports. One cabinet may accommodate more than one system in same equipment room.

G. Provide engraved plastic nameplates, attached with rivets or screws, for instruments and controls inside cabinet and on the cabinet face. Each controller must have a label that matches the designation used on the shop drawings. Each cabinet must have a label that matches the designation on the shop drawings. Each controller must have a label that describes the distribution panel board and circuit breaker that supplies its power. Each group of transformers must have a label that describes the distribution panel board and circuit breaker that supplies the group's power. If all components inside a cabinet are powered from the same circuit breaker, place the power source label on the front of the cabinet.

H. Provide raceway, electrical wiring and wiring devices.

I. Provide a dedicated 120 Vac, 20 amp circuit for the Tier #1 web and server and each Tier #2 controller. Tier #3 controllers that require 120 vac must be powered from the same circuit as the associated Tier #2 controller or a dedicated 20 amp circuit for Tier #3 controllers. The

transformers for Tier #3 controllers that require 24 vac must be powered from the same circuit as the associated Tier #2 controller or a dedicated 20 amp circuit for Tier #3 controllers. The associated sensors and actuators of each Tier #2 and Tier #3 controller must be powered from the same circuit as the controller. If sensors and actuators must be electrically isolated from each other or their controllers, use 1:1 isolation transformers so that the same power circuit requirement is met. The FMS components, including sensors and actuators, must not share power circuits with anything else.

J. Low voltage wiring must be run in raceway in exposed locations and non-accessible ceiling and wall areas. In concealed but accessible locations, control wiring must be in cable tray where available. Where cable tray is not available, low voltage control wiring must be neatly routed parallel and perpendicular to the building lines above accessible ceilings and grouped using D-rings. Use type CL2P (plenum) cable for all wiring and cables not in enclosed raceway. No raceway may be installed in view of occupants except in mechanical and electrical utility rooms.

K. When installing a current sensor on any motor that is controlled by a VFD, place the current sensor on the power entering side of the VFD. Provide a separate junction box up-stream of the VFD to house the CT.

L. Provide conduit and electrical wiring. Refer to electrical specification for conduit requirements. All conduits for control system wiring and cabling must match the color required in the electrical Specification Section 26 0553 Identification for Electrical Systems.

END OF SECTION 23 0913

SECTION 23 09 23
DDC SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tier #1 / #2 local area network
B. Tier #3 local area network
C. FMS access from outside the building locations
D. Tier #2 stand-alone controllers
E. Tier #2 controllers firmware and software
F. Tier #3 programmable and application specific controllers

1.02 RELATED SECTIONS

A. Specification Section 23 0913 - DDC Instruments and Control Devices for HVAC
B. Specification Section 23 0993 - Sequence of Operation for HVAC Controls

1.03 REFERENCES

A. ASHRAE 85 - Automatic Control Terminology for Heating, Ventilating, Air Conditioning
B. ASME MC85.1 - Terminology for Automatic Control
C. NEMA EMC1 - Energy Management Systems Definitions
D. NFPA 70 - National Electrical Code
E. NEMA 250 - Enclosures for Electrical Equipment (1000 volts max)
F. UL 508C - Standard for Safety Power Conversion Equipment
G. UL 864 - Control Units and Accessories for Fire Alarm Systems

1.04 SYSTEM DESCRIPTION

A. The automatic Facility Management System (FMS) in the customers building is arranged in three functional tiers.
    1. Tier #1 level is the information gathering level optimized for operator access. This level is not required for operation of the automation system but does contain the connection to the Internet required for this project.
    2. Tier #2 level has major system or major area controllers. These controllers may control major systems such as energy plants and complex air handlers. These controllers perform advanced functions such as real time clocks, time of day schedules, trend storage, demand limiting, optimum start, chiller plant optimization, etc. These controllers may oversee a multitude of Tier #3 controllers serving a building or a major subdivision of a building. These controllers communicate peer to peer and do not depend on any Tier #1 device for operation and global coordination with other Tier #2 controllers.
    3. Tier #3 level has both major system and individual system controllers. These are either application specific controllers or field programmable controllers. These controllers usually depend on the Tier #2 controllers for advanced functions, time clock and global coordination. These controllers are capable of operation independent of the Tier #2 and Tier #3 controllers but may lose advanced functions and global coordination.

B. The FMS is a Heating, Ventilation and Air Conditioning (HVAC) monitoring and control system using both field programmable microprocessor based units and application specific microprocessor based units. This specification refers to the web server, located at Tier #1, the stand-alone controllers located at Tier #2 and the field programmable and application specific controllers located at Tier #3.

C. The Tier #1, Tier #2 and Tier #3 FMS described in this specification must include all hardware, wiring, installation, software and licenses required to meet this specifications intent, even if not specifically required or mentioned in this specification.

D. The three tier levels are functional. The physical configuration of the FMS may flatten to one or two levels. The Tier 2 controllers may communicate with each other over the same network that Tier 1 uses. The Tier 3 controllers may communicate connect to a Tier 2 device using a RS-485 local area network or use the same network that the Tier 1 and Tier 2 controllers use. Thermostats may use the same network that the Tier 1 and Tier 2 controllers use.

1.05 DEFINITIONS

A. Ensure terminology used in submittals conforms to ASHRAE 85.

1.06 SUBMITTALS

A. See Specification Section 23 0913 DDC Instruments and Control Devices for HVAC.

1.07 PROJECT RECORD DOCUMENTS

A. See Specification Section 23 0913 DDC Instruments and Control Devices for HVAC.

1.08 OPERATION AND MAINTENANCE DATA

A. Include interconnection wiring diagrams complete field installed system with identified and numbered, system components and devices.

B. Include keyboard illustrations and step-by-step procedures indexed for each operator function at an operator interface when using the graphical user interface.

C. Include inspection period, cleaning methods, cleaning materials recommended and calibration tolerances.

1.09 QUALIFICATIONS

A. The FMS contractor must maintain a field technician force of at least five technicians. Each technician must have at least one year experience programming and otherwise servicing the FMS contractor's model line of controls installed under this contract. The technician must be home based within a 150 mile radius of the project site, must be an employee of the FMS contractor, must be currently employed as a technician whom spends a majority of work hours on customer job sites, must have an individual specific vehicle tagged for use to respond to customer sites and an individual specific service tool capable of accessing the Tier #2 and Tier #3 controllers.

B. The installer must be a company specializing in applying the work of this section with a minimum of five years experience. The installer may be a subcontractor with the minimum five years experience with their work overseen and directed by the FMS contractor.

C. Any electrician installing electrical circuits must be licensed in the State of Iowa as a Class A or Class B Master Electrician or must be licensed in Iowa as a Class A or Class B Journeyman Electrician and be employed either by a Iowa recognized electrical contractor or a Iowa licensed Class A or Class B Master Electrician. This licensing requirement does not apply to the installation of Class 2 or Class 3 remote control circuits, signaling circuits, power limited circuits, optical fiber cables, other cabling or communications circuits, including raceways, as defined by NFPA 70 for voice, video, audio and data circuits. Refer to Iowa Code Section 103.

1.10 REGULATORY REQUIREMENTS

A. Electrical installation to conform to requirements of NFPA 70.

B. Products must be listed and classified by Underwriters Laboratories, Inc. (UL) or ETL as suitable for the purpose specified and indicated. If the FMS system is controlling an engineered smoke control system, the Tier #2 and Tier #3 controllers and any Ethernet switches routing smoke control commands and feedback must be listed as UL 864 devices.

C. All electrical work must be inspected in accordance with Iowa law. The inspection must be conducted by a state licensed inspector or the inspector of a political subdivision that Iowa law

recognizes as allowed to conduct inspections inside that subdivision. This inspection requirement does not apply to the installation of Class 2 or Class 3 remote control circuits, signaling circuits, power limited circuits, optical fiber cables, other cabling or communications circuits, including raceways, as defined by NFPA 70 for voice, video, audio and data circuits. Refer to Iowa Code Section 103.

1.11 DELIVERY, STORAGE, AND HANDLING

A. All computers, controllers and other hardware such as sensors and transmitters must be new and arrive at the job site in manufacturer's original packing. Inspect for damage and replace any damaged hardware immediately with new.

B. Store in a clean, dry indoor space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to components, enclosure, and finish.

1.12 COORDINATION

A. Ensure installation of components is complementary to installation of similar components in other systems.

B. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

C. Ensure system is completed and commissioned.

1.13 WARRANTY

A. See Specification Section 23 0913 DDC Instruments and Control Devices for HVAC Part 1.07 for warranty start and duration.

B. All warranty service must be conducted by a technician employed by the FMS contractor except that problems specific to installation by a subcontractor may be resolved by that subcontractor.

1.14 MAINTENANCE SERVICE

A. No regular maintenance of the control system is required after the warranty starts.

B. Submit a written report to the owner after any warranty call. The report must state the reason for the warranty call, the FMS contractor's technicians diagnosis and any hardware or software repair or replacement required.

1.15 SCOPE

A. All control systems must be DDC with electronic actuation.

PART 2 PRODUCTS

2.01 MANUFACTURERS AND PRODUCT LINES

A. Trane at Suite 100, 1400 SE 19th St., Grimes, IA 50111.

2.02 GENERAL PRODUCT DESCRIPTION

A. The FMS must be capable of integrating multiple building functions including equipment supervision and control, alarm management, energy management, historical data collection and archiving.

B. The FMS must consist of the following:
   1. Stand alone programmable DDC controllers at the Tier #3 level. These controllers may depend on a Tier #2 controller to implement advanced control strategies and global coordination.
   2. Stand alone application specific DDC controllers (ASC's) at the Tier #3 level. These controllers may depend on a Tier #2 controller to implement advanced control strategies and global coordination.
   3. Stand alone programmable DDC controllers at the Tier #2 level. These controllers communicate peer to peer with other Tier #2 controllers and must not depend on any Tier

#1 controller to communicate or pass information to and from other Tier #2 controllers. The Tier #2 controllers are capable of implementing advanced control strategies and global coordination without the presence of any Tier #1 controller or device.

4. An interconnection to the Internet using a web server at the Tier #1 level. The web server connects the FMS to the customers Ethernet TCP/IP data network.
5. A single communications network installed by the FMS contractor that connects to all Tier #2 controllers and Tier #1 devices. The Tier #1 / #2 network must be separate from any other network in the building.
6. The Tier #3 communications networks, if separate from the Tier #1/#2, installed by the FMS contractor.
7. The system must be modular in nature and must permit expansion of both capacity and functionality through the addition of sensors, actuators, Tier #2 controllers and Tier #3 controllers.

C. Each Tier #2 controller must operate independently by performing its own specified control program, alarm management, operator I/O and historical data collection. The failure of any single component or network connection at the Tier #2 level must not interrupt the execution of control strategies at other Tier #2 controllers. The Tier #2 controllers must communicate peer to peer and not require the presence of Tier #1 controllers, servers or work stations to enable this communication.

D. Tier #2 controllers must be able to access any data from or send control commands and alarm reports directly to any other Tier #2 controller or combination of controllers on the network without dependence upon a central processing device. Any Tier #2 controller must be able to send alarm reports to multiple operator interfaces without dependence upon a central processing device.

E. Each Tier #3 level controller must operate independently by performing its' own control program. The failure of any single component or network connection at the Tier #3 level must not interrupt the execution of control strategies at other Tier #3 controllers. Any global input points used by Tier #3 controllers must remain at last known value upon loss of communications with the Tier #2 controller.

2.03 TIER #1 / #2 LOCAL AREA NETWORK

A. The design of the FMS must connect the web server and Tier #2 controllers on a stand-alone, FMS specific Tier #2 local area network. Inherent in the system's design must be the ability to expand or modify the network. This network is independent of any other networks in the building.

B. Tier #2 controllers, the network must use BACnet TCP/IP. If there are three or fewer Tier #2 controllers on a new network, the network may use BACnet MS/TP.

C. The network must include provisions for automatically reconfiguring itself to allow all still operational equipment to perform their designated functions as effectively as possible in the event of single or multiple failures of servers, web servers, Tier #2 controllers or the network.

D. The Tier #1 devices and Tier #2 controllers must communicate peer to peer on this local area network.

E. The time clocks in all Tier #2 controllers must synchronize over the network.

F. Alarm and data file transfers must not interfere with the Tier #2 local area network activity.

G. The network must be cabled using CAT 6 with a dark green jacket. The FMS contractor must provide all routers, switches, repeaters and power supplies necessary to operate this FMS dedicated network.

2.04 TIER #3 LOCAL AREA NETWORKS

A. The design of the FMS must connect all of the Tier #3 controllers associated with a Tier #2 controller onto a stand-alone, FMS specific Tier #3 local area network. Inherent in the system's design must be the ability to expand or modify the network.

B. The network may consist of multiple segments originating at the Tier #2 controller. Each segment must install as a daisy chain, stringing the Tier #3 controllers together linearly. No star or tee taps are allowed.

C. The Tier #3 networks' cables must have a dark green jacket, similar in shade to the Tier #1/#2 cable jacket color.

D. Any or all of the Tier #3 controllers may connect to the Tier #1 / #2 network

2.05 FMS ACCESS FROM OUTSIDE THE BUILDING LOCATIONS

A. Any computer or cell phone running a web browser connected to the building's internal information technology Ethernet or to the Internet and the building's internal Ethernet is connected to the Internet and presenting the correct password, must have the ability to access all graphics, trends, reports, alarms, point status, command points, acknowledge alarms and modify programs in any Tier #2 controller. The number of computers simultaneously accessing the FMS system may be limited by the number of user licenses owned by the building owner. The FMS contractor must provide at least one license for this project. The licenses must reside on the web server so that the connected device does not need to have any hardware or software installed to allow it access.

B. Communications must be provided to allow the Tier #2 controllers to send alarms to remote operator devices via the Internet.
   1. The Tier #2 controllers must automatically send email messages to off-site computers and web enabled cell phones to report critical alarms.
   2. The Tier #2 controllers must analyze and prioritize all alarms to minimize the initiation of calls to the remote operator stations.

C. The fact that communications is taking place over the Internet must be completely transparent to the remote operator. A remote operator must be able to access this building by selection of its logical name.

D. The web server must store the interactive graphics created for the requirements in Specification section 23 0993. The graphics must be available to any user with appropriate password accessing the web server. The graphics must dynamically update their information at least every 2 seconds. The user with appropriate password must be able to command the digital, multi-stage and analog points that are on the graphic. Create a home graphic showing the outline of the building with links to all of the subgraphics.

E. The web server must allow the user to view the simultaneous trend at least two dynamic values and at least four stored values.

2.06 TIER #2 STAND-ALONE CONTROLLERS

A. Tier #2 controllers must be microprocessor based, multi-tasking, multi-user, real-time digital control processors. Each Tier #2 controller must consist of modular hardware with enclosed processors, communication controllers, power supplies and input/output modules (as needed). A sufficient number of controllers must be supplied to fully meet the requirements of this specification.

B. Each Tier #2 controller must allow operator access through the controller's serial interface. The operator must be presented with information through English language prompting and English language point identification.

C. Point identification, engineering units, status indication, and applicable naming conventions must be the same at all Tier #2 controllers and remotely connected computers.

D. Multiple-level password access protection must be provided to allow the user / manager to limit display and data base manipulation capabilities as that manager deems appropriate for each user, based upon an assigned password.

E. Passwords must be exactly the same for all operator devices, including panel-mounted network terminals. Any additions or changes made to pass work definition must automatically cause passwords at all Tier #2 and Tier #3 controllers on a network to be updated and downloaded to

minimize the task of maintaining system security. Users must not be required to update passwords for controllers individually.

F. A minimum of 5 levels of access must be supported:
   1. Level 1 = Data Access and Display
   2. Level 2 = Level 1 + Operator Over Rides
   3. Level 3 = Level 2 + Point Add/Delete/Modify
   4. Level 4 - Level 3 + Program Add/Delete/Modify
   5. Level 5 = Level 4 + Password Add/Delete/Modify
   6. A minimum of 10 passwords must be supported at each Tier #2 controller.
   7. Operators will be able to perform only those commands available for their respective passwords. Menu selections displayed at any operator device, including portable or panel mounted devices, and must be limited to only those items defined for the access level of the password used to log-on.
   8. User-definable, automatic log-off timers of from 1 to 60 minutes must be provided to prevent operators from inadvertently leaving devices on-line.

G. Operator Commands: The operator interface must allow the operator to perform commands including, but not limited to the following:
   1. Start up or shut down selected equipment.
   2. Adjust setpoints.
   3. Add/Modify/Delete time programming.
   4. Enable/Disable process execution.
   5. Lock/Unlock alarm reporting for each point.
   6. Enable/Disable total for each point.
   7. Enable/Disable trending for each point.
   8. Change PID loop set point.
   9. Enter temporary over ride schedules.
   10. Define holiday schedules.
   11. Change time/date.

H. Each Tier #2 controller must have sufficient memory to support its own operating system and data bases including:
   1. Control processes.
   2. Energy management applications.
   3. Alarm management.
   4. Historical/trend data for all points.
   5. Maintenance support applications.
   6. Custom processes.
   7. Operator I/O.
   8. Dial-up communications.
   9. Manual over ride monitoring.

I. An operator must be able to use fill-in-the-blank templates and graphical programming or unstructured line programming similar to the BASIC programming language to create programs to control equipment.
   1. In graphical programming, control sequences are created by using an input device to draw interconnecting lines between symbols depicting inputs, operators (comparisons and mathematical calculations) and outputs of a control sequence.
   2. In line programming, control sequences are created by using lines of control code similar to the BASIC programming language. Control code that is not similar to BASIC language must not be used without engineer approval.

J. The Tier #2 controllers are not required to directly support I/O points.

K. If the Tier #2 controller directly supports I/O points, it must support the following:
   1. Digital inputs for status/alarm contacts.

2. Digital outputs for on/off equipment control. All digital outputs must have a hand /off /auto override located at the controller. The hand /off /auto override status must be accessible by an operator at a remote device such as an operator terminal or web server connectedcell phone or a Tier #2 controller.
3. Analog inputs. The available analog inputs must include 0 to 10 Vdc.
4. Analog Outputs. The available analog outputs must include 0 to 10 Vdc. All analog outputs must have an off/on/auto or gradual position/auto override switch located at the controller. The override status must be accessible by an operator at a remote device such as an operator terminal or web server connectedcell phone or a Tier #2 controller.
5. Pulse accumulator digital input for pulsed dry contact monitoring.
6. The controller may add I/O points with expansion modules.

L. Each Tier #2 controller must have at least one RS232 and one USB or two USB serial data communication port(s) for serial printers, laptop workstations, controller mounted operator terminals and portable operator terminals. The controller must allow temporary use of portable devices without interrupting the operation of permanently connected modems, printers and terminals.

M. The Tier #2 architecture must be modular in nature and allow easy expansion by adding additional Tier #2 controllers to the Tier #2 local area network. The FMS must be able to support at least 20 Tier #2 controllers and expand by only needing to install the new controller and extend the Tier #2 local area network to it. If the Tier #2 controller directly supports I/O points, it must be able to support 100% more of each of the supported point types than installed in this contract by nothing more than installing the appropriate point type modules and connecting to the Tier #2 controller.

N. If normal power is interrupted, initiate an orderly shutdown of the affected Tier #2 controller(s) to prevent the loss of the operating system, point database, program, and other data such as trends. The real time clock and volatile memory must have a backup power source that will maintain the clock and memory for an accumulated 72 hours of power outages.

O. Upon restoration of normal power the Tier #2 controller must automatically resume full operation without manual intervention.

P. Should a Tier #2 controller memory be lost for any reason, the user must have the capability of reloading the Tier #2 controller via the local port or via Internet.

2.07 TIER #2 CONTROLLERS FIRMWARE AND SOFTWARE

A. General:
1. All necessary software to form a complete operating system as described in this specification must be provided.
2. The software programs specified in this section must be provided as an integral part of the Tier #2 controller and must not be dependent upon any higher level computer for execution.

B. Control Software Description:
1. The controllers must have the ability to perform the following pre-tested control algorithms:
   a. Two position control.
   b. Proportional control.
   c. Proportional plus integral control.
   d. Proportional, integral plus derivative control.
2. Upon the resumption of normal power, the controller must analyze the status of all controlled equipment, compare it with normal occupancy scheduling and turn equipment on or off as necessary to resume normal operation.

C. Tier #2 controllers must have the ability to perform any or all of the following energy management routines.
1. Time of day scheduling.
2. Calendar based scheduling.

3. Holiday scheduling.
4. Temporary schedule over rides.
5. Optimal start.
6. Optimal stop.
7. Night setback control.
8. Fan speed /CFM control.
9. Heating / cooling interlock.
10. Hot water reset.
11. Chilled water reset.
12. Condenser water reset.
13. Chiller sequencing.

D. All programs must be executed automatically without the need for operator intervention, and must be flexible enough to allow user customization. Programs must be applied to building equipment as described in the sequence of control.

E. Tier #2 controllers must be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.

F. It must be possible to use any of the following process inputs and variables in a custom process:
1. Any system-measured point data or status.
2. Any calculated data.
3. Any results from other processes.
4. User defined constants.
5. Arithmetic functions (=, -, *, /, square root, Expo, etc.)
6. Boolean logic operators (and, or, exclusive or, etc.)
7. On-delay/off-delay/interval timers.

G. Custom processes may be triggered based on any combination of the following:
1. Time interval.
2. Time of day.
3. Date.
4. Other processes.
5. Time programming.
6. Events (e.g. point alarms).

H. A single process must be able to incorporate measured or calculated data from any and all other Tier #2 and Tier #3 controllers.

I. In addition a single process must be able to issue commands to points in any and all other Tier #2 and Tier #3 controllers.

J. Processes must be able to generate operation messages and advisories to operator I/O devices. A process must be able to directly send a message to a specified device, buffer the information in a follow-up file or cause the execution of a dial-up or Internet connection to a remote device such as a computer or cell phone.

K. The custom control programming feature must be able to be documented and that documentation stored in the Tier #2 controller. The documentation may via graphical flow charts or English language comment statements.

L. Alarm management must be provided to monitor, buffer and direct alarm reports to operator devices and memory files. Each Tier #2 controller must perform distributed independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost. At no time must the Tier #2 controller's ability to report alarms be affected by either operator activity at a remote computer or local I/O device or communications with other Tier #2 controllers.

M. All alarm or point change reports must include the point's English language description and the time and date of occurrence.

N. The user must be able to define the specific system reaction for each point. Alarms must be prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of three priority levels must be provided.

O. Users must have the ability to manually inhibit alarm reporting for each point. The user must also be able to define under which conditions point changes need to be acknowledged by an operator, and/or sent to follow-up files for retrieval and analysis at a later date.

P. Alarm reports, messages, and files must be directed to a user-defined list of operator devices or used for archiving alarm information. Alarms must also be automatically directed to a default device in the event a primary device is found to be off-line.

Q. Only alarms defined by the user as critical alarms may initiate a call to a remote operator device. In all other cases, call activity must be minimized by time-stamping and saving reports until an operator scheduled time, a manual request or until the buffer space is full.

R. Data collection utilities must be provided to automatically sample, store and display system data. The operator manually selects points for trending. Each Tier #2 controller must have a dedicated buffer for trend data and must be capable of storing a minimum of 2500 total data samples and 200 samples for each defined point.
   1. Tier #2 controllers must store histories for all points defined for trending.
   2. The point trend must automatically sample the value of selected points by time interval or by change of value as selected by the operator.

S. Tier #2 controllers must automatically accumulate and store run time hours for digital outputs and digital inputs defined by the operator. The operator manually selects points for run time accumulation.

T. The run time totalizer must accumulate run time in minutes or hours as selected by the operator.

U. Tier #2 controllers must automatically sample, calculate and store consumption totals on a daily, weekly, or monthly basis for user-selected analog and digital pulse input type points.

V. Total must provide calculation and storage of accumulations of up to 99,999.9 units (e.g. KWH, gallons, KBTU, tons. etc.)

2.08 TIER #3 PROGRAMMABLE AND APPLICATION SPECIFIC CONTROLLERS

A. Each Tier #2 controller must be able to extend its performance and capacity with Tier #3 controllers.

B. Tier #3 controllers must be microprocessor based, multi-tasking digital control processors. Each Tier #3 controller must consist of modular hardware with enclosed processors, communication controllers, power supplies and input/output points. Each controller may use canned programs resident on EEPROM (Application Specific Controllers), needing only setup parameters to be modified in the field, or custom programs resident on RAM (Programmable Controllers) which are loaded in the field. A sufficient number of controllers must be supplied to fully meet the requirements of this specification.

C. Each Tier #3 controller must have sufficient memory to support its own operating system and data bases including:
   1. Control processes.
   2. Operator I/O.

D. An operator must be able to use fill-in-the-blank templates and graphical programming or unstructured line programming similar to the BASIC programming language to create programs to control equipment in programmable controllers.
   1. In graphical programming, control sequences are created by using a mouse input device to draw interconnecting lines between symbols depicting inputs, operators (comparisons and mathematical calculations) and outputs of a control sequence.

2. In line programming, control sequences are created by using lines of control code similar to the BASIC programming language. Control code that is not similar to BASIC language must not be used without engineer approval.

E. The operator interface to a Tier #3 controller to view its data points or to a Tier #3 programmable controller to view its program must be through a remote device accessing through the Tier #1 web server or through a portable terminal using an industry standard application connected to any Tier #2 controller or directly to the particular Tier #3 controller.

F. In the event of the loss of normal power, there must be an orderly shutdown to prevent the loss of database or operating system software. Battery backup must be provided to support all volatile memory for a minimum of 72 hours. If the point database, programs and any programmable parameters are stored in non-volatile memory and are instantly available without needing to download from a higher tier mass storage device when power is restored, no battery backup is required.

G. Each Tier #3 controller must contain the point database and program necessary to execute the sequence of control for the equipment that it controls. The controller must not rely on any other controller, except for global points, to execute the sequence of control. Examples of global points are outside air temperature, time schedules in higher tier controllers that index the Tier #3 controller between occupied and unoccupied mode and water temperature supplied from the central energy plant. If the Tier #3 controller loses reception of some or all global points, it must continue to execute the sequence of control with last known values.

H. The Tier #3 controller must support the following:
1. Digital inputs for status/alarm contacts.
2. Digital outputs for on/off equipment control. All digital outputs must have a hand/off/auto override switch located at the controller. The hand/off/auto status must be viewable by an operator at a remote device such as an operator terminal or web server connected cell phone or a Tier #2 controller.
3. Analog inputs. The analog inputs must include 0 to 10 Vdc.
4. Analog outputs. The analog outputs must include 0 to 10 Vdc. The analog outputs must have an off/on/auto or gradual position/auto override switch located at the controller. The override status must be viewable by an operator at a remote device such as an operator terminal or web server connected cell phone or a Tier #2 controller.
5. Pulse accumulator digital input for pulsed dry contact monitoring.
6. The controller may add I/O points with expansion modules.

I. A small Tier #3 controller used to control only one terminal device to include VAV air valves, active chilled beams, fan coil units, blower coil units, cabinet unit heaters, unit heaters, heat pumps, furnaces, convectors, and fin tube radiation may support only the following:
1. Digital inputs for status/alarm contacts.
2. Digital outputs for on/off equipment control.
3. Analog inputs. The controller must have at least one analog input, even if the sequence of control or point list does not require one.
4. Analog outputs. The analog outputs may be 0-10 Vdc or a pair of digital outputs working as a coordinated open/close pair to pulse width modulate a floating actuator. If the analog output is a coordinated pair of digital outputs, the controller must utilize algorithms designed to smoothly and gradually open and close the actuator.

PART 3 EXECUTION

3.01 PREPARATION

A. See Specification Section 23 0913 DDC Instruments and Control Devices for HVAC Part 3.01 for preparation requirements.

3.02 INSTALLATION

A. See Specification Section 23 0913 DDC Instruments and Control Devices for HVAC Part 3.02 for installation requirements.

3.03 FMS MANUFACTURER'S FIELD SERVICES

A. Provide a field technician meeting the requirements, except residency and vehicle, stated in Part 1 - Qualifications for Field Technicians to instruct up to four owner's representatives in the operation of the Tier #1 web server, Tier #2 controllers and Tier #3 controllers. This instruction must be at least 8 hours in length, conducted in no more than four hour long segments.

B. Provide a field technician meeting the requirements, except residency and vehicle, stated in Part 1 - Qualifications for Field Technicians to instruct up to four owner's representatives in operating the web server's human interface features. This training must include navigation through graphics, creating user accounts, viewing and acknowledging alarms, viewing input and output points, commanding output points, creating and modifying time of day schedules, creating and modifying alarms including transmitting alarms to cell phones and Internet accessible off site computers and backing up and restoring data bases. The training needs to heavily emphasize creating and modifying time of day schedules, creating user accounts, viewing and acknowledging alarms and navigation through graphics. The other required topics may be covered more lightly and should only be covered after the users master the emphasized topics. This instruction must be at least 16 hours in length, conducted in no more than four hour long segments.

END OF SECTION

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SECTION 23 09 93
SEQUENCE OF OPERATION

PART 1 GENERAL

1.01 SCOPE

A. VAV air valve with reheat

B. RTU-1,2,3

C. AC-1

D. MS-1

E. ERV-1 (Alternate)

F. EF-5 (Locker rooms)

G. Exhaust fans and temperature control and monitoring

1.02 SPECIFICATION SECTION

A. 23 0913 - DDC Instruments and Control Devices for HVAC

B. 23 0923 - Direct Digital Control System

1.03 GENERAL PROVISIONS

A. The Facility Management System (FMS) contractor, general contractor, mechanical contractor, electrical contractor, low voltage systems contractor and all equipment suppliers must examine this sequence of operation and provide hardware, software, design services, technician services, programming services, computers, controllers, sensors, transmitters, switches, actuated devices, relays, contactors, automation dampers, electrical power, cabling, wiring, enclosures, raceways, installations and anything else required to implement the intent of the individual sequences of control embodied in this sequence of operation and result in fully functioning FMS systems. The FMS system includes all required interfaces and connections to equipment not furnished by the FMS contractor. Anything required to meet the intent of this sequence of operation, even if not specifically listed, must be furnished, installed, or provided as required.

B. FMS Tiers
   1. The facility management system (FMS) is established in three tiers.
   2. These tiers are functional. The physical layout may place all devices on one, two or three levels of communication. For example, an Ethernet network to which thermostats, sensors, actuators, controllers, and web servers connected would be physically a single tier but function as the three tiers described here.
   3. Tier 1 refers to the enterprise level tier. This is the level where servers, integration bridges to other systems and bridges to the Internet are located. This level is populated by B-BC Building Controllers.
   4. Tier 2 refers to the programmable controller level tier. This is where controllers with real time clocks communicate with each other peer to peer. The Tier 2 controllers run complex, custom programmed functions such as energy plants and complex air handlers. The Tier 2 controllers may also provide integration bridges to other systems. This level is populated by B-AAC Advanced Application Controllers.
   5. Tier 3 refers to the application specific controller level tier. This is where preprogrammed or custom programmed controllers focus on single purpose functions such as controlling a single air valve. The Tier 3 controllers usually require coordination and clock functions from a Tier 2 controller. This is the level populated by B-AAC Advanced Application Controllers, B-ASC Application Specific Controllers, B-SA Smart Actuators and B-SS Smart Sensors.

C. The requirements stated in this sequence of operation take precedence over any control features or requirements stated in the specification document or in the drawing notes for any equipment that is touched by this sequence of operation.

D. The equipment suppliers must examine all this sequence of operation. They are commended to pay attention to the following parts of the sequence of operation because of the need to integrate the FMS with the factory provided controls on the equipment.
   1. RTU-1,2,3 must be integrated

E. All points in the point lists must be provided. Additionally, any additional physical or virtual points that are required to execute the sequence of operation must also be provided as part of the base bid contract.

F. All set points, alarm thresholds, timers, dead bands, time constants, sampling intervals, etc. stated in the sequence of operation are preliminary and must be modified by the FMS contractor during start up, formal commissioning and as required during the warranty period to insure a stable and comfortable building environment commensurate with proper operation of the equipment that preserves their manufacturers' warranties.

G. All P, PI and PID control loops must be tuned during startup to provide a combination of timely response and stability. The loops must not be tuned only for stability. The loops must be as fast responding as possible, consistent with stability. Continuous loop tuning may be implemented.

H. All VFD speeds must be represented in terms of 0 – 100% on the graphics. The 0% must represent the minimum speed of the connected motor (i.e., a pump motor with a minimum allowed speed of 12 Hz has 12 Hz represented by 0%). The 100% must represent the maximum speed of the connected motor (i.e., a fan motor with a design CFM delivery speed of 75 Hz has 75 Hz represented by 100%).

I. VFDs must be programmed at their controller to not run slower than 12 Hz, regardless of the speed signal from the FMS.

J. All ECM speeds must be represented in terms of 0 – 100% on the graphic. The 0% must represent the stop speed control signal to the connected motor. Note on the graphic the minimum start speed of the ECM (i.e., a motor that runs with a speed signal of 10% or higher has a minimum start speed of 10%.). An example is an ECM that responds to a 0 – 10 Vdc speed control signal. Use 0% to represent 0 Vdc. If the motor stops with a signal less than 1 Vdc, the minimum start speed is 10% as that a signal at or above 1 Vdc starts the motor. The startup technician must command the motor to its minimum start speed percentage and verify the motor did start. Adjust the minimum start speed percentage upwards as needed so the motor always starts if commanded to that percentage. This could result in a particular motor have a 15% minimum start speed while all other motors have a 10% minimum start speed.

K. ECM speed signals from the FMS must be programmed in the FMS to not be lower than the minimum start speed if the motor is commanded to run. (i.e., if an ECM runs if it has a signal at or above 10%, do not allow the speed signal to be below 10% if the motor is supposed to be running.). Use a MAX statement that compares the motor speed control signal from the motor speed control algorithm with the minimum start speed and always output the higher of the two values. If the ECM is supposed to stop, output the 0% (stop) speed control signal.

L. When the control system is fully operational, label each control input sensor or transmitter, thermostat, safety control, actuator, valve controller, control enclosure, VFD enclosure, motor starter, switch, and switch position. Label with a secure, permanent tag that is marked with the device designation used in the as-built control shop drawings. The tag must be outdoor rated and waterproof self-adhesive printed vinyl, engraved phenolic, engraved, or stamped aluminum or engraved or stamped brass. The tag must be secured by backing adhesive (vinyl), epoxy glue, rivets, screws, or a substantial wire.

M. When the control system is fully operational, the FMS contractor must provide the control system database, graphics, individual controller programs, as built shop drawings and as built catalog cut files to the owner. These must all be placed on two CDs or flash drives. The as-built shop drawings and as built catalog cut files must be formatted as Adobe .PDF (latest revision). The owner must be able to use the CD or flash drive files to restore the complete

control system's as-built operation after all Tier 1, Tier 2 and Tier 3 controllers have lost their memories.

N. All physical and integrated control points must have a minimum of 168 hours of trend data. All digital input and output points must record each change of status. All analog input and output points must record their value every 5 minutes. These control point trend logs must overwrite themselves after 168 hours.

O. The FMS contractor must include the following:
   1. Provide and connect all building automation equipment for HVAC equipment control. The building automation equipment includes but is not limited to:
      a. Sensors and transmitters
      b. Thermostats
      c. Controllers
      d. Relays and bases
      e. Switches
      f. Transformers and power supplies
      g. Actuators
      h. Panels and other enclosures for other building automation equipment.
      i. Panel's and other enclosure's interior components and materials such as back planes, mounting rails, terminal blocks, wire duct, wire and cables.
   2. Provide the Tiers 1, 2 and 3 communications infrastructure to include:
      a. Tier 1 communications infrastructure.
      b. Tier 2 communications infrastructure.
      c. Tier 3 communications infrastructure.
      d. The three tiers are functional. The physical communications infrastructure may be one, two or three layers.
   3. Provide all connections to any packaged equipment's control system required to affect the sequences described in this specification section. These connections include but are not limited to RS-232, RS-485, USB, fiber optics and individually wired hard wire connections.
   4. Provide all 120 VAC branch circuits and low voltage AC and DC power required for all components provided by the FMS contractor.
   5. Provide the wires, cables, and raceway for the 120 VAC and low voltage FMS infrastructure.

P. Document Presentation Aids
   1. These presentation aids do not appear in the project specification book. The FMS vendor must request a Word document from Mark Hersch at Modus mhersch@modus-eng.com to see these aids. When requesting the Word document, make it clear that this is for Waterloo City Hall.
   2. Bold indicates a point passed between the FMS and the AHU through the BACnet integration.
   3. CAPITALIZED UNDERLINED indicates a set point value in the FMS control program.
   4. CAPITALIZED AND NOT UNDERLINED indicates a virtual point value in the FMS control program.

Q. Point Notes.
   1. The point notes apply to the equipment sequences in PART 3.
   2. Determine means to make a calculation at a time interval. For example, determine the set point every 15 minutes means to calculate a set point and maintain the value of the calculation for 15 minutes then calculate the set point again. This allows the control system to adjust to a set point before needing to adjust to a new set point.
   3. Evaluate means to look at a point status or point value and store the value. For example, evaluate the outdoor air temperature every 30 minutes means to look at the outdoor temperature and store the value for 30 minutes then look again and update the stored

outdoor air temperature. This stabilizes the program response to rapid changes in the evaluated point.

4. If a point is labeled (GRAPHIC), that point must be placed on the equipment's master graphic so authorized users may adjust (AO) or toggle (DO) or index (MSV). The analog values stated in this sequence are good starting points. The FMS contractor must adjust these values during startup to optimize control operation. If the point resides in the equipment's factory provided controls (i.e., set back temperature set point), the FMS must reach to the resident point through the integration.
5. If a point is labeled (adj.), the point must be a virtual point that is changed by commanding the point to a new value by a command line prompt or clicking on the point on a point data base display. The point is not displayed on the graphic. The initial value given in this sequence is a good starting point. These points must be adjusted as needed during system startup to provide stable and comfortable system operation.
6. If a point is labeled (locally adj.), that control must be readily adjustable by hand or with a screwdriver. The initial value given in this sequence is a good starting point. These points must be adjusted as needed during system startup to provide stable and comfortable system operation.
7. Point notes for integrated equipment.
    a. If a point related to integrated equipment is labeled (GRAPHIC), that point must be placed on the equipment's master graphic so authorized users may adjust (AO) or toggle (DO). The analog values stated in this sequence are good starting points. The FMS contractor must adjust these values during startup to optimize control operation. If the point resides in the integrated equipment's factory provided controls (i.e., set back temperature set point), the FMS must reach to the equipment's resident point through the integration.
    b. If a point is labeled (FMS), that point resides in the FMS.
    c. If a point is labeled (EQUIP), that point resides in the integrated equipment's factory provided controls.
    d. If a point is labeled (FMS adj.), that point must be adjustable from a user logged into the FMS system or by the program running in the FMS. The values stated in this sequence are good starting points. The FMS contractor must adjust these values during startup to optimize control operation.
    e. If a point is labeled (EQUIP adj.), that point may be adjustable from a user using a service tool or man to machine interface that is connected to the integrated equipment's factory provided controls. The values stated in this sequence are good starting points. The FMS contractor must adjust these values during startup to optimize control operation. This kind of point may also be accessible through the FMS at the FMS contractor's discretion.

R. Graphics must follow City of Waterloo standard.

S. Scheduling must follow City of Waterloo standard.

T. Alarms must follow City of Waterloo standard.
    1. The alarms for each system are either general or critical alarms. All critical alarms are specifically defined as such in the sequence of operation. All other alarms are general.
    2. A critical alarm must cause the FMS to email and / or otherwise contact the users and annunciate the alarm.
    3. A general alarm must buffer at the web server or other alarm reporting location until acknowledged by a user.

PART 2 NOT USED

PART 3 EXECUTION

3.01 VAV AIR VALVE WITH REHEAT

A. The unit functions as a variable air volume air valve (VAV).
    1. The VAV has:

a. Pressure independent air valve with CFM measuring
b. Modulating electric reheat coil

2. The VAV must have a field installed control system that executes this section of the sequence of control.

B. The FMS contractor must include the following:
1. Provide a dedicated Tier 3 controller (T3C) for each air valve.
2. The FMS contractor may use an application specific controller with an EEPROM resident canned application or a field loaded control vendor standard program.
3. The intention is to use an ASHRAE Guideline 36 VAV air valve sequence of control.
4. Provide a supply air temperature sensor (TE-1) that is placed downstream of the heating coil.
5. Provide a wall mounted thermostat (TH-1) that includes the following:
a. Local set point adjustment.
b. Unoccupied override button.
c. Software limit the set point adjustment range to 70F to 75F (adj.).
d. Override button initiates occupied operation for a time duration adjustable up to at least four hours.
e. CO2 sensor
f. Relative humidity (RH) sensor

C. Set Points
1. The room temperature set point is set using the thermostat's (TH-1) local set point adjustment.
2. There is a 4F (adj.) deadband between the cooling and heating set points.
a. The cooling temperature set point is 2F (adj.) above the room temperature set point.
b. The heating temperature set point is 2F (adj.) below the room temperature set point.
3. The SETBACK TEMPERATURE SET POINT is 62F (GRAPHIC). Limit adjustment range to between 60F (adj.) and 67F (adj.).
4. The SETUP TEMPERATURE SET POINT is 84F (GRAPHIC). Limit adjustment range to between 78F (adj.) and 85F (adj.).
5. The heating discharge air minimum temperature set point is 72F (adj.).
6. The HEATING DISCHARGE AIR MAXIMUM TEMPERATURE SET POINT is 90F (GRAPHIC). Limit adjustment range to between 85F (ad.) and 100F (adj.).
7. The cooling maximum CFM set point (adj.) is on the schedule.
8. The minimum CFM set point (adj.) is on the schedule.
9. The heating maximum CFM set point (adj.) is on the schedule.
10. The override time set point is 2 hours (adj.).

D. Protection Functions
1. Safeties.
a. If no supply fan on the associated RTU indicates on, shut off the electric reheat.
2. Alarms. Alarms must appear and buffer at the alarm reporting locations until acknowledged.
a. If the room temperature (TH-1) is higher than 4F above the SETUP TEMPERATURE SET POINT for 30 minutes (adj.) or lower than 4F below the SETBACK TEMPERATURE SET POINT for 30 minutes (adj.), annunciate an alarm.
b. If the room temperature (TH-1) is below 45F (adj.), annunciate a critical alarm.
c. If the room relative humidity (RH) is above 60% (adj.) for longer than 30 minutes (adj.), annunciate an alarm.
d. If the room CO2 level is higher than 1,200 PPM (adj.) for longer than 30 minutes (adj.), annunciate an alarm.

E. The FMS indexes the associated AHU between occupied and unoccupied based on its time-of-day schedule.

F. The FMS indexes the room thermostat between occupied and unoccupied.

1. The associated RTU's time-of-day schedule indexes the room thermostat.
2. Using the override button indexes the room thermostat to occupied. If the override time set point expires and the time of day of schedule is unoccupied, the room thermostat indexes to unoccupied.
3. If the thermostat is indexed to occupied, the heating and cooling set points correspond with the setting on the local thermostat.
4. If the thermostat is indexed to unoccupied, the heating set point is the SETBACK TEMPERATURE SET POINT and the cooling set point is the SETUP TEMPERATURE SET POINT.

G. If the thermostat is indexed to unoccupied.
   1. If the room temperature is at or below the SETBACK TEMPERATURE SET POINT:
      a. Vote to start and run the associated RTU.
      b. Modulate the air valve to maintain its CFM at the heating maximum CFM set point.
      c. Modulate the reheat to maintain the discharge air temperature at the HEATING DISCHARGE AIR MAXIMUM TEMPERATURE SET POINT.
   2. If the room temperature is between the SETBACK TEMPERATURE SET POINT and the SETUP TEMPERATURE SET POINT.
      a. Do not vote to start and run the associated RTU.
      b. Modulate the air valve to maintain its CFM at the minimum CFM set point.
      c. Stop the reheat.
   3. If the room temperature is above the SETUP TEMPERATURE SET POINT:
      a. Vote to start and run the associated RTU.
      b. Modulate the air valve to maintain its CFM at the cooling maximum CFM set point.
      c. Stop the reheat.
   4. If all air valves' SETBACK TEMPERATURE SET POINTs and SETUP TEMPERATURE SET POINTs are satisfied, stop the associated RTU.

H. If the thermostat is indexed to occupied.
   1. If the room temperature is below the heating temperature set point:
      a. Reheat Control
         1) Increase the heating discharge air temperature set point from the heating discharge air minimum temperature set point to the HEATING DISCHARGE AIR MAXIMUM TEMPERATURE SET POINT with increasing heating demand.
         2) Modulate the reheat to maintain the supply air temperature (TE-1) at the heating discharge air temperature set point.
      b. Air Valve Control
         1) Keep the CFM at the minimum CFM set point until the heating discharge air temperature set point is at the HEATING DISCHARGE AIR MAXIMUM TEMPERATURE SET POINT.
         2) Once the heating discharge air temperature set point is at its maximum, increase the CFM set point from the minimum CFM set point to the heating maximum CFM set point with increasing heating demand.
         3) Modulate the air valve to maintain the supply air CFM at the CFM set point.
   2. If the room temperature is between the heating temperature set point and the cooling temperature set point:
      a. Stop the reheat.
      b. Modulate the air valve to maintain the minimum CFM set point.
   3. If the room temperature is at or above the cooling temperature set point:
      a. Stop the reheat.
      b. Increase the CFM set point from the minimum CFM set point to the cooling maximum CFM set point with increasing cooling demand.
      c. Modulate the air valve to maintain the supply air CFM at the CFM set point.

I. Points List

1. All points shown here must appear on each air valve's graphic.
2. All points labeled as (GRAPHIC) must appear on each air valve's graphic.
3. Analog Input (AI) (to T3C)
    a. Room temperature (TH-1)
    b. Supply air temperature (TE-1)
    c. Room temperature set point (TH-1)
    d. Room relative humidity (TH-1)
    e. Room CO2 level (TH-1)
    f. Supply air CFM
4. Analog Output (AO) (from T3C)
    a. Air valve position
    b. Reheat output
5. Digital Input (DI) (to T3C)
    a. Unoccupied override (TH-1)
6. Linkage
    a. Direct link from the graphic to the sequence of operation section VAV AIR VALVE WITH REHEAT.
    b. Direct link from the graphic to the time-of-day schedule.

3.02 RTU-1,2,3

A. The VAV rooftop air handler (RTU) functions as a multiple zone VAV unit.
    1. The RTU has:
        a. Variable speed supply fan
        b. DX cooling with four asymmetrical compressors
        c. Modulating gas heating section
        d. Air side economizer with outdoor dry bulb control by the FMS
        e. Outside air CFM measuring and control
        f. Constant speed exhaust fans with modulating relief damper
    2. The RTU must have a factory installed control system that executes this section of the sequence of control.

B. The RTU's factory provided controls must perform the important control functions that include the following.
    1. The basis of design is a Trane Voyager 3.
    2. Supply air discharge temperature control using the heating section, economizer, and cooling section.
    3. Supply duct static pressure control using the variable speed supply fan.
    4. Outside air ventilation using the outside air CFM measuring and control
    5. Building pressure control using the relief fans and modulating relief damper.
    6. The facility management system (FMS) is an interface between the user and the RTU and does not perform any control function. It is used to command the RTU on / off, input set points to the RTU controls and monitor selected physical and virtual points that are in the RTU controls. The RTU must be capable of performing the important control functions as if the FMS were not present.

C. The RTU manufacturer must include the following:
    1. Provide a factory control system that executes this section of the sequence of control.
    2. The factory provided control system's points must be accessible for view and adjustment by a service tool or man to machine interface connected to the control system. The tool or interface does not need to be furnished as part of this contract.
    3. Provide all hardware, software and permanent licenses required to implement an interface to the FMS using BACnet MS/TP or BACnet TCP/IP.
        a. The FMS contractor must not be required to do more than connect a cable to the RTU's factory controls and be able to communicate in the required protocol to implement the interface.

b. The FMS contractor may be required to map points across the integration.

4. Provide an integration points list with registry information that is specific to the equipment furnished for this job.
   a. A general integration points list that is not edited for the specific serial number(s) shipped for this job is not acceptable.
   b. This list must be part of the RTU submittal.
5. Provide or furnish a static pressure sensor for supply duct static pressure control. The sensor must span at least 0 - 2.5 in WC. The sensor may be provided in the RTU with a field installed pneumatic tube extended to the sensing point or may be furnished as a loose sensor with the requirement to field install it at the sensing location.
6. Provide or furnish a differential pressure sensor for building inside to outside differential pressure control. The sensor must span at least -0.25 - 0 – 0.25 in WC. The sensor may be provided in the RTU with field installed pneumatic tubes extended to the indoor and outdoor sensing points or may be furnished as a loose sensor with the requirement to field install it at the sensing location.

D. The FMS contractor must include the following:
1. Integrate to the RTU control system using the communication protocol required by the RTU's manufacturer. The integration protocol must be BACnet MS/TP or BACnet TCP/IP.
2. Install the supply duct static pressure sensor. If the sensor is installed in the RTU, extend the air tube to the sensing location. If the sensor is shipped loose, the FMS contractor must provide the wiring from the instrument to the RTU.
   a. Place the RTU-1 duct static pressure sensor near inlet to VAV-1300 serving Corridor 1300.
   b. Place the RTU-2 duct static pressure sensor near inlet to VAV-1328 serving Records.
   c. Place the RTU-3 duct static pressure sensor near inlet to VAV-1322 serving Detectives Bay 1302.
3. Install the building differential pressure sensor. If the sensor is installed in the RTU, extend the air tubes to the sensing locations. If the sensor is shipped loose, the FMS contractor must provide the wiring from the instrument to the RTU.
   a. Install the inside pressure sensing point.
      1) Place the RTU-1 inside pressure sensing point in Corridor 1306.
      2) Place the RTU-2 inside pressure sensing point in Lobby 1001.
      3) Place the RTU-3 inside pressure sensing point in Briefing Room 1313.
   b. Use a Dwyer A-420A wind gust pressure attenuator for the outside air pressure pickup.
   c. Place the wind gust pressure attenuator at the top of a 10-foot-long ¾" EMT that is attached to the side of the RTU. Bend the top of the EMT so the attenuator's baffle plate is parallel to the ground.
4. Provide a current activated status switch (CS-1) for the supply fan.

E. Integrated Points
1. The integration is BACnet MS/TP and BACnet TCP/IP.
2. The points in this list express the function of write and read integrated points. The manufacturer may use different names to describe the points. The manufacturer may use several points working together to obtain the function.
3. Occupancy Input BAS (BV) (Occupied, Unoccupied) (write) [If Occupancy Input BAS is Occupied, the RTU runs. If Occupancy Input BAS is Unoccupied, the RTU stops.]
4. Discharge Air Cooling Setpoint BAS (deg F) (write) = SUPPLY AIR COOLING TEMPERATURE SET POINT [The FMS calculates the required supply air cooling temperature set point from outside air temperature and commands the RTU to maintain that set point.]
5. Discharge Air Heating Setpoint BAS (deg F) (write) = SUPPLY AIR HEATING TEMPERATURE SET POINT [The FMS calculates the required supply air heating

temperature set point from the supply air cooling temperature set point and commands the RTU to maintain that set point.]

6. Economizer Outdoor Air Enable Setpoint BAS (deg F) (write) [The outside air temperature at which the economizer enables. The RTU senses outside air temperature and the RTU controls index the economizer on and off.] = ECONOMIZER ON TEMPERATURE SET POINT
7. Economizer Minimum Position Setpoint BAS (AV) (%) (write) [The outside air damper's minimum position.] = OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT
8. Duct Static Pressure Setpoint BAS (in W.C.) (write) = SUPPLY DUCT STATIC PRESSURE SET POINT [The supply fan modulates to maintain this pressure at the duct static pressure sensing point.]
9. Space Static Pressure Setpoint BAS (in W.C.) (write) = INSIDE TO OUTSIDE DIFFERENTIAL PRESSURE SET POINT [The exhaust fans stage and the relief damper modulates to maintain this set point.]
10. Discharge Air Temperature Local (deg F) (read)
11. Mixed Air Temperature Local (deg F) (read)
12. Return Air Temperature Input (deg F) (read)
13. Duct Static Pressure Local (in W.C.) (read)
14. Space Static Pressure Input (in W.C.) (read) [This is the inside to outside differential pressure. A positive value indicates the inside pressure is higher than the outside pressure.]
15. Supply Fan Speed Command Status (%) (read) [This shows the commanded speed of the supply fan.]
16. Exhaust Fan Speed Status (%) (read) [This shows the commanded speed of the exhaust fan.]
17. Supply Fan Status (on or off) (read) (Label on graphic as "RTU")
18. Exhaust Fan Output Status (on or off) (read) [Indicates if the exhaust fans are on or off. The fans are controlled by the building differential pressure controller.]
19. Cooling Capacity Status (%) (read) [Indicates the operating cooling capacity.]
20. Compressor 1 Command Status (on or off) (read)
21. Compressor 2 Command Status (on or off) (read)
22. Compressor 3 Command Status (on or off) (read)
23. Compressor 4 Command Status (on or off) (read)
24. Heating Capacity Primary Status (%) (read) [Indicates the operating heating capacity.]

F. RTU Protection Functions
   1. Hard Wired Safeties
      a. Safeties must be hard wired and not depend on the operation of the FMS to work.
      b. If the building fire alarm activates, shut down the fans.
   2. Alarms
      a. Alarms must appear and buffer at the alarm reporting locations until acknowledged.
      b. If the supply fan indicates (CS-1) on and if the Discharge Air Temperature Local is below 40F (adj.) for longer than 5 minutes (adj.), annunciate an alarm.
      c. If the supply fan indicates (CS-1) on and if the Discharge Air Temperature Local is below 30F (adj.) for longer than 5 minutes (adj.), annunciate a critical alarm.
      d. If the Occupancy Input BAS is Occupied [indicating that the RTU is commanded to run] and if the supply fan indicates (CS-1) off, annunciate an alarm.
      e. If the Occupancy Input BAS is Unoccupied [indicating that the RTU is commanded to stop] and if the supply fan indicates (CS-1) on, annunciate an alarm.

G. Set Points
   1. SUPPLY AIR COOLING TEMPERATURE SET POINT:
      a. Evaluate (This means to look at a point status or point value and store the value. For example, evaluate the outdoor air temperature every 15 minutes means to look at the outdoor temperature and store the value for 15 minutes then look again and update

the stored outdoor air temperature.) the outside air temperature every 15 minutes (adj.).
   b. If the stored outside air temperature's value is below 55F, the SUPPLY AIR COOLING TEMPERATURE SET POINT is 60F.
   c. If the stored outside air temperature's value is above 60F, the SUPPLY AIR COOLING TEMPERATURE SET POINT is 55F.
   d. Change the SUPPLY AIR COOLING TEMPERATURE SET POINT between 60F and 55F as the stored outside air temperature value varies between 55F and 60F.
2. The SUPPLY AIR HEATING TEMPERATURE SET POINT is 4F (adj.) below the SUPPLY AIR COOLING TEMPERATURE SET POINT.
3. The ECONOMIZER ON TEMPERATURE SET POINT is 67F (adj.).
4. The SUPPLY DUCT STATIC PRESSURE SET POINT is 0.75 in W.C. (GRAPHIC). Limit adjustment range to between 0.5 in W.C. (adj.) and 1.5 in W.C. (adj.).
5. The INSIDE TO OUTSIDE DIFFERENTIAL PRESSURE SET POINT is 0.05 in. W.C. (GRAPHIC). Limit adjustment range to between 0.01 in W.C. and 0.1 in W.C.
6. OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT
   a. Evaluate (This means to look at the points' values and store the values. For example, evaluate the room CO2 level every 15 minutes means to look at the associated rooms' CO2 levels and store the values for 15 minutes then look again and update the stored room CO2 levels.) the associated rooms' CO2 levels (see section VAV AIR VALVE WITH REHEAT) every 15 minutes.
   b. If two or more stored rooms' CO2 levels are at or above 950 PPM, command OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT to 30%.
   c. If one or none stored rooms' CO2 levels are at or above 950 PPM, command OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT to 10%.

H. RTU On / Off
1. Use a FMS time clock based optimized start routine to transition the RTU from night operation to day operation.
   a. The optimizer goal is to have the room temperature no lower than 69F during cool or cold weather and no higher than 76F during warm or hot weather.
   b. Room temperature for optimizer goal.
      1) Use HR Office 3207 for RTU-1.
      2) Use Lobby 1001 for RTU-2.
      3) Use Mayor's Office 3301 for RTU-3.
2. At no less than 15 minutes and no more than two hours before scheduled day operation.
   a. Index Occupancy Input BAS to Occupied.
   b. Command OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT to 0%.
   c. Index the VAV air valve controllers to occupied.
3. At the start of scheduled day operation.
   a. Command OUTSIDE AIR MINIMUM CFM SET POINT to position determined by the rooms' CO2 levels.
4. If the time-of-day schedule indicates night operation and if a user presses any VAV air valve's thermostat's unoccupied override button:
   a. Index Occupancy Input BAS to Occupied.
   b. Command OUTSIDE AIR MINIMUM CFM SET POINT to position determined by the rooms' CO2 levels.
   c. Index the VAV air valve controllers to unoccupied. The locally overridden air valve controller will switch to its occupied room temperature set point.
5. If the time-of-day schedule indicates night operation and if the override time is expired at all VAV air valve's thermostats and (if any room temperature is at or above its VAV air valve controller's night setup temperature or if at or below its VAV air valve controller's night setback temperature):
   a. Index Occupancy Input BAS to Occupied.

b. Command OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT to 0%.
c. Index the VAV air valve controllers to unoccupied.

6. If the time-of-day schedule indicates night operation and if the override time is expired at all VAV air valve's thermostats and if all room temperatures are between the VAV air valve controllers' night setback and night setup temperature set points:
   a. Index Occupancy Input BAS to Occupied.
   b. Command OUTSIDE AIR DAMPER MINIMUM POSITION SET POINT to 0%.
   c. Index the VAV air valve controllers to unoccupied.
7. If the FMS indexes Occupancy Input BAS to Occupied.
   a. The supply fan runs.
   b. The supply fan may modulate.
   c. The relief fans run.
   d. The relief fans may modulate.
   e. The DX compressors may stage.
   f. The heating section may cycle and modulate.
   g. The outside and return air dampers may modulate.
8. If the FMS indexes Occupancy Input BAS to Unoccupied.
   a. The supply fan stops.
   b. The relief fans stop.
   c. The DX compressors stop.
   d. The heating section stops.
   e. The outside air damper closes.
   f. The return air damper opens.

I. Supply Air Temperature Control
   1. The RTU controls operate the economizer and compressors to maintain the SUPPLY AIR COOLING TEMPERATURE SET POINT.
   2. The RTU controls operate the heating section to maintain the SUPPLY AIR HEATING TEMPERATURE SET POINT.

J. Supply Duct Static Pressure Control
   1. The RTU controls modulate the supply fan to maintain the SUPPLY DUCT STATIC PRESSURE SET POINT.

K. Building Pressure Control
   1. The RTU controls operate the relief fans.
   2. The relief fans modulate to maintain the inside to outside differential pressure at the INSIDE TO OUTSIDE DIFFERENTIAL PRESSURE SET POINT.

L. Points List
   1. All points listed below must appear on the RTU graphic.
   2. All points in the sequence labeled as (GRAPHIC) must appear on the RTU graphic.
   3. All integrated points must appear on the RTU graphic.
   4. Analog Input (AI)
      a. Outside air temperature (global)
   5. Digital Input (DI)
      a. Supply fan status (CS-1) (current switch) (Label on graphic as "FMS")
   6. Linkage
      a. Direct link from the graphic to the sequence of operation section RTU-1,2,3.
      b. Direct link from the graphic to the time-of-day schedule.

3.03 AC-1

A. The IDF room units (CRAC) function as single zone computer room conditioning units.
   1. CRAC has:
      a. Supply fan
      b. DX cooling with a remote air-cooled condenser

2. The CRAC must have a complete factory installed control system that executes this section of the sequence of control.

B. The CRAC's factory provided controls must perform the important control functions that include the following.
   1. Room temperature control using the cooling section.
   2. The facility management system (FMS) monitors the CRAC and the room and does not perform any control function.

C. The CRAC manufacturer must include the following:
   1. Provide a factory control system that executes this section of the sequence of control.
   2. The factory provided control system's points must be accessible for view and adjustment by a service tool or man to machine interface connected to the control system. The tool or interface does not need to be furnished as part of this contract.
   3. Furnish a thermostat for each CRAC.

D. The FMS contractor must include the following:
   1. Install the room thermostat and wire it to the CRAC indoor unit.
   2. Provide control wiring and cabling between the CRAC indoor unit and the CRAC condensing unit.
   3. Provide a room temperature sensor (TE-1).
   4. Provide a discharge temperature sensor (TE-2).
   5. Provide a supply fan status sensor (CS-1).

E. CRAC Protection Functions
   1. Alarms
      a. Alarms must appear and buffer at the alarm reporting locations until acknowledged.
      b. If the room temperature (TE-1) is above 80F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.

F. CRAC On / Off
   1. The CRAC runs always.

G. Room Air Temperature Control
   1. The CRAC controls cycles the compressor to maintain the room temperature set point (local).

H. Points List.
   1. All points listed below must appear on the CRAC graphic.
   2. Analog Input (AI)
      a. Room air temperature (TE-1)
      b. Supply air temperature (TE-2) (2)
      c. Outside air temperature (global)
   3. Digital Input (DI)
      a. Supply fan status (current sensor) (CS-1) (2)
   4. Linkage
      a. Direct link from the graphic to the sequence of operation section AC-1.

3.04 MS-1

A. Each mini-split system is a heat or cool indoor unit with an outside unit or a cool only indoor unit with an outside unit.

B. The mini-split manufacturer must furnish a thermostat.

C. The FMS contractor must include the following:
   1. Install the thermostat.
   2. Install control wiring between the thermostat and the indoor unit and the outdoor unit.

D. The FMS contractor must include the following:
   1. Provide a room temperature sensor (TE-1).

E. Alarms. Alarms must appear and buffer at the alarm reporting locations until acknowledged.
   1. If the room temperature (TE-1) is below 50F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.
   2. If the room temperature (TE-1) is above 80F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.

F. Points List
   1. Analog Input (AI)
      a. Room temperature (TE-1)

3.05 ERV-1 (ALTERNATE)

A. The energy recovery ventilator (ERV) functions as a 100% outside air, 100% exhaust air energy exchange unit.
   1. The ERV has:
      a. Constant speed supply fan with factory VFD or ECM for balancing.
      b. Constant speed exhaust fan with factory VFD or ECM for balancing.
      c. Total energy resin bed outside air to exhaust air energy exchange.
   2. The ERV must have a complete field installed control system that executes this sequence of control.

B. The ERV manufacturer must include the following:
   1. An outdoor air isolation damper and open / close actuator. The damper opens when the fans run and closes when the fans stop.
   2. An exhaust air isolation damper and open / close actuator. The damper opens when the fans run and closes when the fans stop.
   3. A VFD or ECM to set supply fan speed.
   4. A VFD or ECM to set exhaust fan speed.

C. The FMS contractor must include the following:
   1. Provide a fresh air temperature sensor (TE-1). Place is the supply air duct leaving the ERV.
   2. Provide a return air temperature sensor (TE-2). Place in the return duct to the ERV.
   3. Provide an exhaust air temperature sensor (TE-3). Place in the exhaust air duct leaving the ERV.
   4. Provide status sensor (CS-1) for the supply fan.
   5. Provide status sensor (CS-2) for the exhaust fan.
   6. Provide a DPDT switch (SW-1) to control ERV-1 On / Auto.
      a. Wire one contact to the ERV-1 start / stop terminal points. Wire the FMS DO in parallel so either contact's closure will run ERV-1.
      b. Wire one contact to the FMS.
      c. Place the switch on the shelter room side of the ERV-1 mechanical room's wall.
      d. Label the switch "Ventilation Unit".
      e. Label one position as ON and the other position as OFF.

D. Alarms
   1. If the On / Auto switch (SW-1) is On, annunciate an alarm.
   2. If On / Auto switch (SW-1) is On and (if the supply fan indicates (CS-1) off or if the exhaust fan indicates (CS-2) off), annunciate an alarm.
   3. If the FMS commands ERV-1 On and (if the supply fan indicates (CS-1) off or if the exhaust fan indicates (CS-2) off), annunciate an alarm.
   4. If On / Auto switch (SW-1) is Auto and if the FMS commands ERV-1 Auto and (if the supply fan indicates (CS-1) on or if the exhaust fan indicates (CS-2) on), annunciate an alarm.

E. ERV On / Off
   1. An operator may index ERV-1 between On and Auto.
   2. A local user may use SW-1 to index ERV-1 between On and Auto.

3. If the FMS commands On or if SW-1 commands on:
    a. The ERV-1 outside air and exhaust air isolation dampers open.
    b. The ERV-1 outside air and exhaust air fans run.
4. If the FMS commands Auto and if SW-1 commands auto:
    a. The ERV-1 outside air and exhaust air fans stop.
    b. The ERV-1 outside air and exhaust air isolation dampers close.

F. Points List
1. All points listed below must appear on the ERV-1 graphic.
2. Analog Input (AI)
    a. Fresh air temperature (TE-1)
    b. Return air temperature (TE-2)
    c. Exhaust air temperature (TE-3)
    d. Outside air temperature (global)
3. Digital Input (DI)
    a. Supply fan status (current sensor) (CS-1)
    b. Exhaust fan status (current sensor) (CS-2)
    c. ERV-1 On / Auto switch (SW-1)
4. Digital Output (DO)
    a. ERV-1 On / Auto
5. Linkage
    a. Direct link from the graphic to the sequence of operation section ERV-1.

3.06 EF-5 (LOCKER ROOMS)

A. The fan runs to limit CO2 and relative humidity levels in the locker room.

B. The FMS contractor must include the following:
1. Provide status sensor (CS-1) for the exhaust fan.

C. Alarms
1. If EF-5 is commanded on and indicates (CS-1) off or if commanded off and indicates on, annunciate an alarm.

D. EF-5 On / Off
1. Use the VAV-1304A thermostat to monitor room conditions (see section VAV AIR VALVE WITH REHEAT).
2. If the room relative humidity is above 60% RH (adj.), run EF-5.
3. If the room CO2 level is above 800 PPM (adj.), run EF-5.
4. If the room relative humidity is below 55% and the room CO2 level is below 750 PPM, stop EF-5.

E. Points List
1. All points listed below must appear on the EF-5 graphic.
2. Analog Input (AI)
    a. Room air temperature (TH-1)
    b. Room relative humidity (TH-1)
    c. Room CO2 (TH-1)
3. Digital Input (DI)
    a. EF-5 fan status (current sensor) (CS-1)
4. Digital Output (DO)
    a. EF-5 On / Off
5. Linkage
    a. Direct link from the graphic to the sequence of operation section EF-5.

3.07 EXHAUST FANS AND TEMPERATURE CONTROL AND MONITORING

A. Sensors
1. Provide the Vestibule 1000 room temperature sensor.

2. Provide the E-bikes 1005 room temperature sensor.
3. Provide the Stair 1007 room temperature sensor.
4. Provide the Vestibule 1305 room temperature sensor.
5. Provide the Police IT 1312 room temperature sensor.
6. Provide the Elevator Mechanical Room 2219 room temperature sensor.
7. Provide the exhaust fans' status current sensors.

B. Alarms
1. If Vestibule 1000 room temperature is below 50F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.
2. If E-bikes 1005 room temperature is below 50F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.
3. If Stair 1007 room temperature is below 60F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.
4. If Vestibule 1305 room temperature is below 50F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.
5. If the Police IT 1312 room temperature is above 80F (adj.) for longer than 10 minutes (adj.), annunciate a critical alarm.
6. If the Elevator Mechanical Room 2219 room temperature is above 90F (adj.) for longer than 10 minutes (adj.), annunciate an alarm.
7. If EF-1 indicates (current switch) off if turned on or indicates on if turned off, annunciate an alarm.
8. If EF-3 indicates (current switch) off if turned on or indicates on if turned off, annunciate an alarm.
9. If EF-4 indicates (current switch) off if turned on or indicates on if turned off, annunciate an alarm.

C. Set Points
1. The ELEVATOR MECHANICAL ROOM 2219 ROOM TEMPERATURE SET POINT is 85F (GRAPHIC). Limit adjustment to between 75F (adj.) and 85F (adj.).

D. EF-1
1. If RTU-1 Occupancy Input BAS (see section RTU-1,2,3) is Occupied or if RTU-2 Occupancy Input BAS is Occupied or if RTU-3 Occupancy Input BAS is Occupied, turn on EF-1.
2. If RTU-1 Occupancy Input BAS is Unoccupied and if RTU-2 Occupancy Input BAS is Unoccupied and if RTU-3 Occupancy Input BAS is Unoccupied, turn off EF-1.

E. EF-3
1. If the Elevator Mechanical Room 2219 room temperature is above the ELEVATOR MECHANICAL ROOM 2219 ROOM TEMPERATURE SET POINT, turn on EF-3.
    a. If the Elevator Mechanical Room 2219 room temperature is lower than 2F below the ELEVATOR MECHANICAL ROOM 2219 ROOM TEMPERATURE SET POINT, turn off EF-3.

F. EF-4
1. If RTU-1 Occupancy Input BAS (see section RTU-1,2,3) is Occupied or if RTU-2 Occupancy Input BAS is Occupied or if RTU-3 Occupancy Input BAS is Occupied, turn on EF-4.
2. If RTU-1 Occupancy Input BAS is Unoccupied and if RTU-2 Occupancy Input BAS is Unoccupied and if RTU-3 Occupancy Input BAS is Unoccupied, turn off EF-4.

G. Points List.
1. All points shown here must appear on a floor plan graphic.
2. All point labeled GRAPHIC must appear on the floor plan graphic.
3. Analog Input (AI)
    a. Vestibule 1000 room temperature
    b. E-bikes 1005 room temperature

c. Stair 1007 room temperature
d. Vestibule 1305 room temperature
e. Police IT 1312 room temperature
f. Elevator Mechanical Room 2219 room temperature

4. Digital Input (DI)
   a. EF-1 status (current switch)
   b. EF-3 status (current switch)
   c. EF-4 status (current switch)
5. Digital Output (DO)
   a. EF-1 On / Off
   b. EF-3 On / Off
   c. EF-4 On / Off
6. Linkage
   a. Direct link from the graphic to the sequence of operation EXHAUST FANS AND TEMPERATURE CONTROL AND MONITORING.

END OF SECTION

SECTION 23 23 00
REFRIGERANT PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping

B. Refrigerant

C. Flexible connections

1.02 RELATED SECTIONS

A. Specification Section 23 6213 - Packaged Air Cooled Refrigerant Compressor and Condensing Units

B. Specification Section 23 8126 - Ductless Split System Units

1.03 REFERENCES

A. ASHRAE 15 - Safety Code for Mechanical Refrigeration

B. ASHRAE 34 - Number Designation of Refrigerants

C. ASME - Boiler and Pressure Vessel Codes, Section IX - Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators

D. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

E. ASME B16.26 - Cast Copper Alloy Fittings For Flared Copper Tubes

F. ASME B31.5 - Refrigeration Piping

G. ASME B31.9 - Building Services Piping

H. ASTM B1003 - Standard Specification for Seamless Copper Tube for Linesets

I. ASTM B88 - Seamless Copper Water Tube

J. ASTM B280 - Seamless Copper Tube for Air Conditioning and Refrigeration Field Service

K. ASTM F708 - Design and Installation of Rigid Pipe Hangers

L. AWS A5.8 - Brazing Filler Metal

M. AWS D1.1 - Structural Welding Code, Steel

N. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer

O. MSS SP69 - Pipe Hangers and Supports - Selection and Application

P. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices

1.04 SYSTEM DESCRIPTION

A. Flexible Connectors: Utilize at or near compressors where indicated on plans.

1.05 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Shop Drawings: Indicate schematic layout of system, including equipment, critical dimensions, and sizes.

b. Product Data: Provide general assembly of specialties, including manufacturers catalog information. Provide manufacturers catalog data including load capacity.
c. Design Data: Submit design data indicating pipe sizing. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
d. Installation Instructions

C. Closeout submittal
1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
a. Operation and Maintenance Information

D. Project Record Documents
1. Indicate final installed locations of all equipment and refrigeration accessories on a PDF floor plan

1.06 QUALIFICATIONS

A. Installer: Company specializing in performing the work of this section with minimum three years experience.

B. Design piping system under direct supervision of a professional engineer experienced in design of this work and licensed in Iowa.

C. All welders shall be certified under ASME Section IX.

1.07 REGULATORY REQUIREMENTS

A. Conform to ASME B31.9 for installation of piping system.

B. Welding Materials and Procedures: Conform to ASME Section IX and applicable state labor regulations.

C. Welder's Certification: In accordance with ASME Section IX.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Architectural Specification.

B. Deliver and store piping in shipping containers with labeling in place.

C. Protect piping from entry of contaminating material by leaving end caps and plugs in place until installation.

D. Dehydrate and charge piping. Seal prior to shipment, and until connected into system.

1.09 MAINTENANCE MATERIALS

A. Provide two refrigeration oil test kits each containing everything required to conduct one test.

PART 2 PRODUCTS

2.01 PIPING

A. Copper Tubing (all sizes) ASTM B280, type #ACR hard drawn
1. Fittings: ASME B16.50 wrought copper alloy
2. Joints: Brazed, ANSI/AWS A5.8 filler metal

B. Copper Tubing (7/8" and smaller): ASTM B280, type #ACR annealed
1. Fittings: ASME B16.26 cast copper alloy
2. Joints: Flared

C. Flexible Line Sets:
1. Tubing: ASTM B280 or B1003 copper tubing
2. Joints: Flared
3. Insulation:
a. Type: Closed Cell Elastomeric (Polyethylene Foam is not acceptable), Insulation must be factory applied. Field installation is not acceptable.

b. Thickness: 1/2" on Suction and Liquid Lines (R 3.0). Provide 1" insulation on tubing 1" and larger.
c. Standards: ASTM C534 (moisture resistance) and UL-94 or ASTM E84 compliant (smoke/flame spread)
d. Jacket: Abrasion and UV resistant coating (5 year warranty). ASTM E96 for permeability

2.02 REFRIGERANT

A. See individual equipment specification or schedule on drawings.

2.03 FLEXIBLE CONNECTORS

A. Manufacturers:
1. Parker
2. Alco
3. Engineer approved equal

B. Corrugated stainless steel hose with single layer of stainless steel exterior braiding, minimum nine inches (9") long with copper tube ends; for maximum working pressure 500 psig.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Route piping in orderly manner with plumbing parallel to building structure and maintain gradient.

B. Install piping to conserve building space and not interfere with use of space.

C. Group piping whenever practical at common elevations and locations.

D. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.

E. Arrange piping to return oil to compressor. Provide traps and loops in piping and provide double risers as required. Slope piping per manufacturer's recommendations. Pipe size to be provided by unit manufacturer.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Provide access to concealed fittings. Coordinate size and location of access doors.

H. Flood piping system with nitrogen when brazing.

I. Where pipe support members are welded to structural building frame, brush clean, and apply one coat of zinc rich primer to welding.

J. Prepare unfinished pipe, fittings, supports, and accessories ready for finish painting.

K. Insulate piping and equipment.

L. Follow ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.

M. Tighten flared fittings to manufacturer-required torque levels.

N. Fully charge completed system with refrigerant after testing.

O. Where more than one piping system material is specified, ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

P. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.

3.03 FIELD QUALITY CONTROL

A. Field inspection and testing shall be performed under provisions of Architectural Specification Sections.

B. Test refrigeration system in accordance with ASME B31.5.

C. Pressure test system with dry nitrogen to the operating pressure of the system. Hold pressure and ensure no leaks for 1 hour. Ensure test conforms to current code and manufacturer requirements.

D. Vacuum test system at 500 microns vacuum. System shall maintain a vacuum of no more than 1,500 microns after 10 minutes.

END OF SECTION

SECTION 23 31 00
HVAC DUCTS AND CASING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials
B. Ductwork fabrication
C. Manufactured ductwork and fittings
D. Casing
E. Exposed spiral ductwork
F. Pre-insulated weatherproof exterior ductwork

1.02 RELATED SECTIONS

A. Specification Section 23 0593 - Testing, Adjusting, and Balancing for HVAC
B. Specification Section 23 0713 - Duct Insulation.
C. Specification Section 23 3300 - Air Duct Accessories.
D. Specification Section 23 3600 - Air Terminal Units.
E. Specification Section 23 3700 - Air Outlets and Inlets.

1.03 REFERENCES

A. ASTM A 36 - Structural Steel
B. ASTM A 90 - Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles
C. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
D. ASTM A 366 - Steel, Sheet, Carbon, Cold Rolled, Commercial Quality
E. ASTM A 480 - General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
F. ASTM A 525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
G. ASTM A 527 - Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality
H. ASTM A 568 - Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled
I. ASTM A 569 - Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality
J. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate
K. ASTM C14 - Concrete Sewer, Storm Drain, and Culvert Pipe
L. ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, using Rubber Gaskets
M. AWS D9.1 - Welding of Sheet Metal
N. NBS PS 15 - Voluntary Product Standard for Custom Contact-Molded Reinforced-Polyester Chemical Resistant Process Equipment
O. NFPA 90A - Installation of Air Conditioning and Ventilating Systems
P. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems
Q. NFPA 91 - Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying
R. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment

S. SMACNA - HVAC Air Duct Leakage Test Manual

T. SMACNA - HVAC Duct Construction Standards - Metal and Flexible

U. UL 181 - Factory-Made Air Ducts and Connectors

1.04 PERFORMANCE REQUIREMENTS

A. No variation of duct configuration or sizes permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.05 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data
      b. Shop Drawings: Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration for four inch (4") pressure class and higher and kitchen hood exhaust systems.

C. Project Record Documents
   1. Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

B. Maintain one copy of document on site.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three-years experience.

B. Installer: Company specializing in performing the work of this section with minimum three-years experience.

1.08 REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A Standards.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures during and after installation of duct sealants.

1.10 WARRANTY

A. Pre-insulated weatherproof exterior ductwork shall have a 10 year warranty.

PART 2 PRODUCTS

2.01 MATERIALS

A. Galvanized Steel Ducts: ASTM A924 and ASTM A653 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.

B. Steel Ducts: ASTM A366, A569, and A568.

C. Stainless Steel: ASTM A480 and ASTM A276 304 and 326 Stainless Steel with a 2B finish. Hot-rolled angles and channels shall conform to ASTM A276

D. Insulated Flexible Duct
   1. Manufacturers:
      a. Thermaflex M-KC
      b. Flexmaster
      c. Atco
      d. Quietflex
      e. Engineer approved equal.
   2. Description: Thermally insulated flexible duct with interlocking spiral wire
   3. Listings: UL 181, NFPA 90A/90B
   4. Outer Shell/Vapor Barrier: Metalized Polyester or Polyethylene film
   5. Inner Shell/Core: Polyester or Chlorinated Polyethylene (CPE)
   6. Insulation: Fiberglass, R-4.2 @ 1.25" thickness
   7. Pressure Rating: 6" positive, 1" negative
   8. Maximum Velocity: 5000 fpm
   9. Temp Range: -20 to 180 deg F
   10. Vapor Transmission: 0.1 perms or less (ASTM E96)
   11. Flex Elbows. UL-2043 plenum rated. Provide 90 degree elbow splines for all connections to diffusers

E. Aluminum Ducts: To be constructed per SMACNA duct construction standards. ASTM B209 3003 alloy. Dimension tolerances of ANSI Standard H 35.2. Angle reinforcements of 6061 alloy T6 per SMACNA standards.

F. Fasteners: Rivets, bolts or sheet metal screws.

G. Duct Sealant
   1. Manufacturers:
      a. Design Polymerics (DP1010)
      b. Ductmate
      c. Durodyne
      d. Hardcast
      e. Engineer approved equal.
   2. Description: Water based, non hardening, high velocity/high pressure duct sealant intended for indoor and outdoor HVAC ducts.
   3. Pressure Rating: 10" water column minimum.
   4. Service Temperature: -20 to 200F
   5. Listings
      a. ASTM E-84/UL723 Flame/Smoke Spread: 25/50 or less.
      b. UL-181B listed for use on Flex Duct connections.
      c. Conforms to NFPA 90A & 90B requirements.
      d. Approved for use on interior of ducts.
   6. VOC Content
      a. 250 g/l or less (SCAQMD Rule 1168 limitations)
      b. CDPH Standard Method v1.1 (14 days): Less than 5.0 mg/m3.

H. Hanger Rod: ASTM A36; steel, galvanized; threaded both ends, threaded one end.

2.02 DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gauges, reinforcing and sealing for operating pressures indicated.

B. Increase duct sizes gradually, not exceeding 15 degree divergence wherever possible; maximum 30 degree divergence upstream of equipment and 45 degree convergence downstream.

C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with fiberglass insulation.

D. Fabricate continuously welded round and oval duct fittings two gauges heavier than duct gauges indicated in SMACNA Standard. Joints shall be minimum four inch (4") cemented slip joint, brazed or electric welded. Prime coat welded joints.

E. Provide standard 45 degree lateral wye takeoffs or 90 degree conical tee takeoffs.

F. Fabricate all exposed ductwork using paint grip galvanized sheet metal.

G. All outside air intake or relief ductwork above finished areas shall be caulked to be watertight. An auxiliary continuous drain pan shall be provided beneath these ducts to prevent damage in case of a waterproofing failure. Line this drain pan with 1/2 inch duct liner and turn up all edges.

H. All joints in rectangular, round or oval ductwork that exceed 100 inches in perimeter length shall be made with Ductmate, TDC, or TDF connections.

2.03 MANUFACTURED DUCTWORK AND FITTINGS

A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

B. Round Ducts: Machine made from round spiral lock seam duct with light reinforcing corrugations, fittings manufactured at least two gauges heavier metal than duct.

C. Double Wall Insulated Round Ducts: Machine made from round spiral lock seam duct with light reinforcing corrugations, galvanized steel outer wall, one inch thick anti-microbial fiberglass insulation, perforated galvanized steel inner wall; fittings manufactured with solid inner wall.

D. PVC Coated Steel Ducts: UL 181, Class 1, galvanized steel duct coated with polyvinyl chloride plastic, 4 mil thick on outside and 2 mil thick on inside.

E. Slab Duct Ventilation System: Machine made from round spiral lock seam duct with light reinforcing corrugations, galvanized steel outer wall, one inch (1") thick fiberglass insulation, perforated galvanized steel inner wall; fittings manufactured with solid inner wall.

2.04 CASINGS

A. Fabricate casings in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and construct for operating pressures indicated.

B. Mount floor mounted casings on four inch (4") high concrete curbs. At floor, rivet panels on eight inch (8") centers to angles. Provide liner of 18 gauge galvanized expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields where floors are acoustically insulated.

C. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles. Install hinged access doors where required for access to equipment for cleaning and inspection. Provide clear wire glass observation ports, minimum 6" x 6" size.

D. Fabricate acoustic casings with reinforcing turned inward. Provide 16 gauge back facing and 22 gauge perforated front facing with 3/32 inch diameter holes on 5/32 inch centers. Construct panels three inch (3") thick packed with 4.5 lb./cu. ft. minimum fiberglass media on inverted channels of 16 gauge.

2.05 EXPOSED SPIRAL DUCTWORK

A. Galvanized spiral duct construction and gauge shall be in accordance with SMACNA HVAC Duct Construction Standards.

B. Fittings: All fittings shall be self-sealing, double lipped, gasket type fittings with EPDM rubber gasket. No external sealant or tape is allowed. Fittings shall be galvanized steel constructed in accordance with ASTM A653 and A924.

C. Elbows: Elbows shall be gored elbows. 45° elbows shall be 3-piece elbows and 90° elbows shall be 5-piece elbows.

D. Hangers: Exposed spiral duct hangers shall be steel aircraft quality zinc coated wire hangers or 1/8" thick, 1" wide galvanized steel strap with threaded rod.

E. Taps: System shall utilize high efficiency shoe type saddle taps.

F. Reducers: All spiral reducers in exposed areas shall be concentric to keep centerline of duct at consistent elevation.

2.06 PRE-INSULATED WEATHERPROOF EXTERIOR DUCTWORK

A. Manufacturers:
   1. Thermaduct OD
   2. Pro-R
   3. Engineer approved equal.

B. Fiber-free closed cell foam insulation, factory bonded to a high impact strength UV stable 1000 micron exterior vinyl shell. Ductwork shall have closed cell, zero fiber insulation and passes the UL 181 mold growth test. Duct shall have a minimum R value of R-8.1 with 1-3/16” thick panel. Color white, 10 year warranty, shell tensile strength of 6,350 psi.

C. Product data:
   1. "K" Value: 0.146 BTU/in/ft/hr./ deg F.
   2. Minimum R-value: R-8.1 both of package and installed.
   3. Maximum Exterior Service Temperature: 185 deg. F.
   4. Maximum Interior Service Temperature: 165 deg. F.
   5. Closed Cell Content: >90%
   6. Vapor Barrier: Bonded aluminum foil with zero permeability, 1000 micron UV stable vinyl
   7. Maximum Flame Spread/Smoke Developed Index: ASTM E84; 25/50
   8. Maximum Air Velocity: 5000 fpm
   9. Maximum Pressure: +/- 6 in. w.g.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

C. All ductwork shall be sealed to provide a SMACNA Seal Class A installation for all longitudinal seams, all transverse seams and all duct penetrations. Flame spread rating shall not exceed 25 and smoke developed shall not exceed 50 when tested in compliance with ASTM-E-84-87.

D. Sealant shall be non-hardening and water resistant. Sealant shall be capable of being applied with a brush and shall be applied in accordance with manufacturer's instructions. Each seam or penetration shall be dressed after application of sealant for neat appearance.

E. Ductwork shall be installed following lines indicated on the drawings. Install offsets, and angles. Transitions may be required to avoid interference with other work and existing conditions. Maintain full capacity of ductwork.

F. Flex Duct Installation:
   1. Maximum length of flex duct: 5ft

2. Provide 90 deg elbow splines to prevent flex duct kinking, especially when connecting to ceiling diffusers
3. Connections to rigid ducts and fittings: Peel back insulation and place flexible inner core over fitting and seal with two layers of duct tape (minimum 2" overlap on fitting and flex duct core). Install clamps over the top of the duct tape. Stretch insulation back over fitting and wrap with two layers of duct tape. Duct Sealant/Mastic may be substituted for the tape that seals the inner core to the fitting. Refer to manufacturer's instructions. Duct tape, mastic/sealant and clamps shall be UL181 listed.

G. Duct sizes:
1. Duct sizes listed on plans are sheet metal outside dimensions.
2. Maintain listed outside dimensions for lined ducts.
3. Any exterior insulation dimension will be in addition to listed sheet metal dimensions.
4. See drawings for specifics on double wall duct dimensions.

H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

I. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

J. Use crimp joints with or without bead for joining round duct sizes eight inch (8") and smaller with crimp in direction of airflow.

K. Use double nuts and lock washers on threaded rod supports.

L. Connect terminal units to supply ducts directly with rigid duct. Do not use flexible duct.

M. Connect diffusers to low pressure ducts directly or with five foot (5') maximum length of flexible duct held in place with strap or clamp.

N. Connect flexible ducts to metal ducts with draw bands.

O. Set plenum doors between 6 and 12 inches above floor. Arrange door swing so that fan static pressure holds door in closed position.

P. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

Q. For units with filtered return air grilles (fan coils, blower coils, heat pumps, etc.), remove the unit filter and connect the return air ductwork tight to the unit. The return duct shall match the size of the unit return air opening.

R. Install pre-insulated weatherproof exterior ductwork in accordance with manufacturer's instructions.

3.02 SCHEDULES

DUCTWORK MATERIAL

AIR SYSTEM	MATERIAL
Supply	Galvanized Steel
Return and Relief	Galvanized Steel
General Exhaust	Galvanized Steel
Outside Air Intake	Galvanized Steel
Ductwork in Shower Rooms, Including above Ceilings	Aluminum, Stainless Steel
Exterior Ductwork	Pre-insulated Weatherproof Exterior Ductwork

DUCTWORK PRESSURE CLASS

AIR SYSTEM	PRESSURE CLASS
Supply (Upstream of VAV units)	3"
Supply (Downstream of VAV units)	1"
Return and Relief	1"
General Exhaust	1"
Intake and Exhaust	1"
Outside Air Intake	1/2"

DUCT PRESSURE CLASS (IN.)	SYSTEM FAN EXTERNAL STATIC PRESSURE
1/2" w.g.	Up to1/2” w.g.
1” w.g.	Over 1/2” up to 1 w.g.
2” w.g.	Over 1” up to 2” w.g.
3” w.g.	Over 2” up to 3” w.g.
4” w.g.	Over 3” up to 4” w.g.
6” w.g.	Over 4” up to 6” w.g.
10” w.g.	Over 6” up to 10” w.g.

END OF SECTION

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SECTION 23 33 00
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Backdraft dampers
B. Combination fire/smoke dampers
C. Smoke dampers
D. Duct access doors
E. Duct test holes
F. Fire dampers
G. Flexible duct connections
H. Rectangular Manual Balance Dampers
I. Round Manual Balance Dampers
J. Manual Balance Damper (Remote Battery Operated)
K. Iris Manual Balance Dampers with flow measurement

1.02 RELATED SECTIONS

A. Specification Section 23 0548 – Vibration and Seismic Controls for HVAC Piping and Equipment
B. Specification Section 23 3100 - HVAC Ducts and Casings.
C. Specification Section 23 3600 - Air Terminal Units.

1.03 REFERENCES

A. AMCA 500-D – Laboratory Methods of Testing Dampers
B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
C. NFPA 90A - Installation of Air Conditioning and Ventilating Systems
D. NFPA 92A - Smoke Control Systems
E. NFPA 70 - National Electrical Code
F. SMACNA - HVAC Duct Construction Standards - Metal and Flexible
G. UL 33 - Heat Responsive Links for Fire-Protection Service
H. UL 555 - Fire Dampers and Ceiling Dampers
I. UL 555S - Leakage Rated Dampers for use in Smoke Control Systems

1.04 SUBMITTALS

A. All submitted documents shall be:
    1. Digital (scanned documents are not acceptable)
    2. Current, within last 5 years
    3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
    4. Have options clearly indicated as applicable to each submittal
B. Construction submittal
    1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
        a. Product Data, including electrical characteristics if applicable
        b. Shop Drawings
        c. Installation Instructions

C. Project Record Documents
   1. Indicate final installed locations of all components on a PDF floor plan, including remote test switches for life safety dampers

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories Inc., as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Architectural Specification Sections.

B. Protect dampers from damage to operating linkages and blades.

1.08 EXTRA MATERIALS

A. Provide two of each size and type of fusible link for each style or type of fire damper or combination fire/smoke damper furnished for this project.

PART 2 PRODUCTS

2.01 BACKDRAFT DAMPERS

A. Backdraft Dampers (Standard)
   1. Manufacturers:
      a. Ruskin BD6
      b. Greenheck
      c. United Enertech
      d. Air Balance
      e. Pottorff
      f. Arrow United
      g. Engineer approved equal.
   2. Construction:
      a. Frame: Extruded aluminum, 0.07” thick, 2" deep assembly
      b. Blades: Extruded aluminum, 0.05" thickness with neoprene or vinyl seals, mechanically attached (no adhesive).
      c. Bearings: Nylon
      d. Axles: 1/2" extruded aluminum
      e. Linkage: Located in airstream
   3. Orientation: Horizontal or "airflow up"
   4. Performance:
      a. Max velocity: 2500 fpm at 24”
      b. Leakage: 8.7 cfm/ft2 @ 1” w.g. (24”x24”)
   5. Mounting: See plans

B. Backdraft Dampers (Premium/Heavy Duty)
   1. Manufacturers:
      a. Tamco 7600 Series
      b. No approved equal.
   2. Construction:
      a. Frame: Extruded aluminum, 0.08” thick, 4" deep assembly
      b. Blades: Extruded aluminum, 0.09" thickness, rounded heads. Seals shall be extruded silicone secured via a slot (no adhesive)
      c. Bearings: Celcon
      d. Axles: 7/16" extruded aluminum

e. Linkage: Located outside of frame.
3. Orientation: Horizontal or "airflow up"
4. Performance:
a. Begin to Open: 20 fpm or 0.05” w.g.
b. Fully Open: 2260 fpm or 0.40” w.g.
c. Max velocity: 3500 fpm at 24” blade width.
5. Mounting: See plans

C. Adjustable Backdraft Dampers
1. Manufacturers
a. Tamco Series 7600CWA
b. No approved equal
2. Construction:
a. Frame: Extruded aluminum, 4" deep
b. Blades: Extruded aluminum, 0.9" thickness, rounded heads. Seals shall be extruded silicone secured via a slot (no adhesive). Each blade is fitted with an internal counterweight.
c. Bearings: Celcon
d. Axles: 7/16" extruded aluminum
e. Hardware: Aluminum or Stainless Steel
3. Orientation: Horizontal, "airflow up" and "airflow down"
4. Adjustable Weight
a. Location: Outside the air stream.
b. Performance:
1) Begin to open: 20 fpm or 0.015"
2) Fully open: 1625 fpm or 0.17"
3) Adjustments to counterweights shall be achieved outside the airstream. Weights requiring access to the inside of the duct are not acceptable.
5. Performance Testing: AMCA 500-D
6. Mounting: See plans

2.02 COMBINATION FIRE/SMOKE DAMPERS

A. Manufacturers:
1. Ruskin
2. Greenheck
3. United Enertech
4. Nailor
5. Air Balance
6. NCA
7. Pottorff
8. Arrow United
9. Engineer approved equal.

B. Fabricate in accordance with NFPA 90A, UL 555S (latest edition) and as indicated.

C. Provide factory sleeve and collar for each damper.

D. Ratings (refer to code review plans for wall classifications):
1. Fire: 1-1/2 hours or 3 hours in accordance with UL555.
2. Smoke: Leakage class II and in accordance with UL 555S.
3. Temperature: 350F
4. Air velocity: 2000 fpm
5. Differential Pressure: 4” WC

E. Multiple Blade Dampers (Vertical & Horizontal):

1. Minimum 16 gauge galvanized steel frame and 6 inch (6”) maximum width double skinned air foil roll formed galvanized steel blades.
2. Oil-impregnated bronze or stainless steel sleeve bearings and plated steel axels.
3. Silicone rubber blade seals permanently bonded to the blade.
4. Stainless steel jamb seals.
5. 1/8" x 1/2" plated steel concealed linkage.
6. Factory installed sleeve. Provide extended length sleeves where required.
7. Stainless steel closure spring, blade stops and lock.
8. 1/2 inch actuator shaft.
9. Fire closure device: Electric thermostat type with externally mounted electric actuator, closure temperature at 212 deg F.

F. Operators:
1. UL listed and labeled spring return electric type suitable for 120 volts, single phase, 60 Hz.
2. Locate damper operator on exterior of duct and link to damper operating shaft.
3. Operator shall have open/close labeling to indicate damper position. Provide factory identification to determine damper position.

G. All damper motors shall be quiet operating. Stall type motors shall not be allowed.

H. Accessories:
1. Field installed duct smoke detector and wiring by fire alarm contractor. Detector shall be installed within the nearby ductwork in accessible location with field installed wiring between the actuator and detector.
2. Provide manufacturer's toggle-style test switch.

2.03 SMOKE DAMPERS

A. Manufacturers:
1. Ruskin
2. Greenheck
3. United Enertech
4. Nailor
5. Air Balance
6. NCA
7. Pottorff
8. Arrow United
9. Engineer approved equal.

B. Fabricate in accordance with NFPA 90A, UL 555S (latest edition) and as indicated.

C. Provide factory sleeve and collar for each damper.

D. Ratings (refer to code review plans for wall classifications):
1. Smoke: Leakage class II and in accordance with UL 555S.
2. Temperature: 350F
3. Air velocity: 4000 fpm
4. Differential Pressure: 4” WC

E. Multiple Blade Dampers (Vertical & Horizontal):
1. Minimum 16 gauge galvanized steel frame and 6 inch (6”) maximum width double skinned air foil roll formed galvanized steel blades.
2. Oil-impregnated bronze or stainless steel sleeve bearings and plated steel axels.
3. Stainless steel jamb seals.
4. 1/8" x 1/2" plated steel concealed linkage.
5. Factory installed sleeve. Provide extended length sleeves where required
6. Stainless steel closure spring, blade stops and lock.
7. 1/2 inch actuator shaft.

F. Operators:

1. UL listed and labeled spring return electric type suitable for 120 volts, single phase, 60 Hz.
2. Locate damper operator on exterior of duct and link to damper operating shaft.
3. Operator shall have open/close labeling to indicate damper position. Provide factory identification to determine damper position.

G. All damper motors shall be quiet operating. Stall type motors shall not be allowed.

H. Accessories:
1. Factory installed duct smoke detector in the damper sleeve with factory installed wiring from the actuator to the smoke detector. Option provides a single point power connection.
2. Provide manufacturer's toggle-style test switch.

2.04 DUCT ACCESS DOORS

A. Manufacturers:
1. Ruskin
2. Nailor
3. Ductmate
4. Acudor
5. Engineer approved equal.

B. Frame: 22 gauge galvanized steel

C. Door: 22 gauge double skin galvanized

D. Seal: Neoprene

E. Insulation: 1” Fiberglass (on insulated duct only)

F. Configuration:
1. Less Than 12 Inch Square: Secure with two (2) Cam locks.
2. Up to 24 inch Square: Continuous plated steel hinge and two Cam locks.
3. Walk Through Access Doors (Plenum Door): Continuous plated steel hinge with two
a. dual acting handles.
4. Spiral Duct Doors: Dual plate covers with large hand tightening knobs.

G. Access doors with sheet metal screw fasteners are not acceptable.

H. Windows: Provide where noted on plans

2.05 DUCT TEST HOLES

A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches or neoprene plugs.

B. Permanent Test Holes: Factory fabricated, airtight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.06 FIRE DAMPERS

A. Manufacturers:
1. Ruskin
2. Greenheck
3. United Enertech
4. Nailor
5. Air Balance
6. NCA
7. Pottorff
8. Arrow United
9. Engineer approved equal.

B. Fabricate in accordance with NFPA 90A and UL 555 (latest edition) and as indicated.

C. Ratings (refer to code review plans for wall classifications):
1. 1-1/2 hours in accordance with UL-555

2. 3 hours in accordance with UL-555
3. Air Velocity: 3000 fpm
4. Differential Pressure: 4” WC

D. Multiple Blade Dampers (Vertical & Horizontal):
1. Minimum 16 gauge galvanized steel frame and 6 inch (6”) maximum width double skinned airfoil roll formed galvanized steel blades.
2. Oil-impregnated bronze or stainless steel sleeve bearings and plated steel axels.
3. 1/8" x 1/2" plated steel concealed linkage.
4. Stainless steel closure spring, blade stops and lock.
5. Locate damper operator on exterior of duct and link to damper operating shaft. Operator shall have open/close labeling to indicate damper position. Provide factory identification to determine damper position.
6. Factory installed sleeve. Provide extended length sleeves where required
7. Provide with round duct transitions where required.
8. Fusible Link: UL 33, separate at 212 deg F with adjustable link straps for combination fire/balancing dampers.

2.07 FLEXIBLE DUCT CONNECTIONS

A. Manufacturers
1. Ductmate ProFlex
2. DuroDyne
3. DynAir/Carlisle
4. Engineer Approved Equal

B. Description: Flexible duct connections to isolate vibration from HVAC equipment

C. Materials:
1. Duct Connections: 24 gauge galvanized sheet metal
2. Fabric Type: Fiberglass core with Neoprene coating. Provide a Hypalon coating (UV resistant) on exterior duct connections.

D. Size:
1. Metal: 3” (both ends)
2. Fabric: 3”. Provide 6” fabric on connections with circumferences greater than 100”

E. Service Temp: -35F to 200F

F. Surface Burning characteristics: Meets ASTM-E84 and NFPA 701

2.08 RECTANGULAR MANUAL BALANCE DAMPERS

A. Size and Application:
1. 18” wide x 12” tall and smaller: Field/Shop Fabricated or Factory Provided.
2. Larger than 18” wide x 12” tall: Factory Provided.

B. Field/Shop Fabricated Rectangular Balance Dampers
1. Fabricate in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible, current addition and per the below:
a. Blade: 24 Gage minimum, but not thinner than two gages thinner than duct gage. Blade must have hemmed edges and be 1/8” smaller than the duct on all sides.
b. Rod: 3/8” minimum. Rod shall be continuous on 2” pressure class and above.
c. Bearings: Provide closed end bearings for rod penetrations
d. Locking Device: Provide quadrant locking device to keep damper in fixed position.
2. Stand-off plate: On insulated ducts, provide a 2” stand-off plate to allow for damper operation after insulation installation.
3. Sealing: Damper component penetration of ducts must be sealed to maintain a Class A Seal rating.

C. Factory Fabricated Manual Balance Dampers

1. Manufacturers
    a. Greenheck MBD
    b. Ruskin
    c. Pottorff
    d. United Enertech
    e. Engineer approved equal
2. Description: Rectangular damper intended for balancing purposes (not for positive shut-off or control)
3. Construction:
    a. Frame: Galvanized, 16 gauge
    b. Blades: Galvanized, 16 gauge, Opposed blade orientation, 20 gauge blade stops
    c. Control Shaft: Steel, 3/8” diameter (minimum)
    d. Bearings: Synthetic Nylon
    e. Linkage: Concealed in frame
    f. Stand-off Plate: 2” stand-off plate to allow for damper operation after insulation installation.
    g. Operator: Locking Hand Quadrant
4. Remote Cable Operator (when indicated on the plans):
    a. Cable Operator: Worm gear operator in lieu of lock hand quadrant.
    b. Cable: Steel, with coupling and clips to secure to operator.
    c. Ceiling Cup/Wall Plate: Galvanized steel and fire rated bracket. See plans for type and location.
5. Performance:
    a. Max Velocity: 1500 fpm
    b. Max Pressure: 2.5” W.C.
    c. Temperature range: -40 to 180 degrees f

2.09 ROUND MANUAL BALANCE DAMPER

A. Field/Shop Fabricated Round Balance Dampers
1. Fabricate in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible, current addition and per the below:
    a. Blade: 24 Gage minimum, but not thinner than two gages more thin than duct gage
    b. Rod: 3/8” minimum. Rod shall be continuous on 2” pressure class and above. Rod shall also be continuous on all ducts 12” and larger.
    c. Bearings: Provide closed end cast alloy bearings for rod penetrations
    d. Locking Device: Provide quadrant locking device to keep damper in fixed position.
    e. Stand-off plate: Provide a 2” stand-off plate to allow for damper operation after insulation installation.
2. Sealing: Damper component penetration of ducts must be closed and sealed to maintain a Class A system rating.

B. Factory Fabricated Manual Balance Dampers
1. Manufacturers
    a. Greenheck MBDR
    b. Ruskin
    c. Pottorff
    d. United Enertech
    e. Engineer approved equal
2. Description: Circular damper intended for balancing purposes (not for positive shut-off or control)
3. Construction:
    a. Frame: Galvanized, 20 gauge
    b. Blade: Galvanized, 20 gauge
    c. Shaft: Steel, 3/8” diameter (minimum)

d. Bearings: Synthetic Nylon
e. Stand-off Plate: 2” stand-off plate to allow for damper operation after insulation installation.
f. Operator: Locking Hand Quadrant

4. Remote Cable Operator (when indicated on the plans):
   a. Cable Operator: Worm gear operator in lieu of lock hand quadrant
   b. Cable: Steel, with coupling and clips to secure to operator.
   c. Ceiling Cup/Wall Plate: Galvanized steel and fire rated bracket. See plans for type and location.
5. Performance:
   a. Max Velocity: 1500 fpm
   b. Max Pressure: 1” W.C.
   c. Temperature range: -25 to 180 degrees

2.10 MANUAL BALANCE DAMPER (REMOTE BATTERY OPERATED)

A. Manufacturers:
   1. Ruskin
   2. Engineer approved equal.

B. Provide motorized balancing damper where indicated. Damper shall be galvanized steel with motorized actuator. Motor shall be gear drive, fail-in-place with nine-volt DC Power through remote damper controller.

C. Provide a single ZRC 020 nine-volt battery remote damper controller to be used during balancing. Turn over controller to owner after balancing.

D. Provide RJ11 connector for cable termination at diffuser or wall box. Box shall be ceiling or wall mounted. Box shall have a label noting the damper being served. See drawings for required cable length.

E. Damper, cabling, and controller shall be provided by mechanical contractor.

2.11 IRIS MANUAL BALANCE DAMPERS WITH FLOW MEASUREMENT

A. Manufacturers
   1. Fantech “IR”
   2. Continental Fan
   3. United Enertech
   4. Young Regulator
   5. Engineer Approved equal

B. Description: Circular damper with pressure taps upstream and downstream of the adjustable orifice blades for airflow balancing/measurement.

C. Construction
   1. Blades and Casing: Galvanized Steel
   2. Connector Gasket: EPDM

D. Operation: Factory supplied spanner wrench.

E. Accuracy: +/- 5% when installed in a straight duct per the installation manual.

F. Sizing: Damper size shall be determined by the required airflow, not the line size noted on the plans. Provide necessary transitions to allow for the appropriately sized damper. Adhere the manufacturer’s requirements for straight duct distances upstream and downstream of the damper.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install duct pressure relief doors in ductwork serving the scheduled equipment.

B. Install duct pressure relief doors in easily observable location.

C. Adjust duct pressure relief doors to the specified pressure relief setting.

D. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible.

E. Provide backdraft dampers on exhaust ducts nearest to outside and where indicated.

F. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers at fire dampers, combination fire and smoke dampers and elsewhere as indicated. Review locations prior to fabrication.

G. Provide duct test holes where indicated and required for testing and balancing purposes.

H. Provide fire dampers, combination fire and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, and breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

I. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.

J. Demonstrate re-setting of fire dampers to owner's representative.

K. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment and supported by vibration isolators.

L. Provide volume balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum two duct widths from duct take-off. Drawings may not indicate all volume damper locations.

M. Provide volume balancing dampers on duct take-off to diffusers, grilles and registers, regardless of whether dampers are specified as part of the diffuser, grille or register assembly. Locate as close as possible yet accessible to the main trunk duct. Drawings may not indicate all volume damper locations.

N. The electrical contractor shall wire smoke damper operators.

O. Provide turning vanes in all supply, return and exhaust ductwork unless noted otherwise. Turning vanes shall not be installed in kitchen hood exhaust, dishwasher hood exhaust and kiln hood exhaust.

P. Provide original installation inspection during construction and 11-month re-inspection after substantial completion of all existing and new fire/smoke/fire smoke dampers in all HVAC systems serving project's construction area. Mechanical Contractor shall adjust, fix or replace any damper found not to meet installation requirements. Provide an electronic log of all dampers with size, location, pre-inspection condition and post-inspection condition to Owner and Design Team after original inspection and after re-inspection of fire/smoke/fire smoke dampers.

END OF SECTION 23 3300

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SECTION 23 34 16
INLINE HVAC FANS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Square inline centrifugal fans (Belt driven)

B. Square inline centrifugal fans (Direct drive)

1.02 RELATED SECTIONS

A. Specification Section 23 07 13 - Duct Insulation

B. Specification Section 23 31 00 - HVAC Ducts and Casings

C. Specification Section 23 33 00 - Air Duct Accessories

D. Specification Section 23 2923 - Variable Frequency Drives

1.03 REFERENCES

A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings

B. ABMA STD 11 - Load Ratings and Fatigue Life for Roller Bearings

C. AMCA 99 - Standards Handbook

D. ANSI/AMCA Standard 204-05 - Balance Quality and Vibration Levels for Fans

E. AMCA 210 - Laboratory Methods of Testing Fans for Rating

F. AMCA 300 - Reverberant Room Method for Sound Testing of Fans

G. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data

H. NEMA MG1 - Motors and Generators

I. NFPA 70 - National Electrical Code

J. SMACNA - HVAC Duct Construction Standards - Metal and Flexible

K. UL Standard 705 - Power Ventilators

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.
      b. Shop Drawings

C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Warranty documentation, fully filled out and including start-up and start date information.
      b. Operation and Maintenance Information

1.05 WARRANTY

A. Assembly: Free from defects in material and workmanship for a period of 12 months from the purchase date.

B. Motor: Motor Warranty is warranted by the motor manufacturer for a period of one year.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Transport, handle, store, and protect products under provisions of Architectural Specification.

B. Protect motors, shafts, and bearings from weather and construction dust.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Do not operate fans for any purpose until ductwork is clean, filters in place, bearings lubricated and fan has been test run under observation.

1.08 EXTRA MATERIALS

A. Supply an extra belt for each fan.

1.09 QUALITY ASSURANCE

A. Performance Ratings: Fans shall conform to AMCA 210 and AMCA 211.

B. Vibration and Balancing: Fans shall be be given an electronic vibration analysis per AMCA 204.

C. Fans shall be tested to AMCA 300 for sound ratings.

D. Fan assemblies shall be listed to UL 705.

E. Spark resistant fans shall meet AMCA 99 fabrication standards.

PART 2 PRODUCTS

2.01 SQUARE INLINE CENTRIGUFAL FANS (BELT DRIVEN)

A. Manufacturers:
   1. Greenheck BSQ
   2. Twin City Fan
   3. Cook
   4. Acme
   5. Pennbarry
   6. Carnes
   7. Engineer approved equal.

B. Cabinet: Aluminum enclosure with duct mounting collars on inlet and outlet. A minimum of two sides shall be removable for fan and motor access. Provide inlet guards on units not connected to ductwork.

C. Fan Wheel: Aluminum Backward inclined wheel that is statically and dynamically balanced AMCA 204-205.

D. Motor:
   1. Motor Enclosure: Open Drip Proof, ODP
   2. Type: Premium efficiency (VFD compatible).
   3. Motors shall be permanently lubricated with heavy duty ball bearings.
   4. Motor Cover: Galvanized Steel cover shall protect motor and shaft.

E. Shaft and Bearings:
   1. Shaft: Polished Steel with anti-corrosive coating
   2. Permanently sealed bearings. Bearing life shall have a minimum L10 life of 100,000 hours (L50 average life of 500,000 hours). On larger units with pillow block bearings provide a grease zerk terminating at the exterior housing.
   3. Shaft speed shall be rated at 25% beyond maximum motor operating speed.

F. Drive Assembly:
   1. Belts, pulleys and keys shall be oversized to 150% of HP rating.

2. Belt: Static free and oil resistant. Provide Belt Guard.
3. Pulley: Cast type keyed to wheel and motor shaft. Pulley shall be adjustable for system balancing.

G. Isolation Supports:
1. 2 Horsepower and smaller: Hanging Neoprene/Rubber mount. Steel top plate. Base plate embedded in oil resistant neoprene. Mount sized by manufacturer based on unit weight.
2. 2-1/2 HP and larger: Hanging spring isolators sized by manufacturer based on unit weight.

H. Electrical Disconnect: Factory provided NEMA 1 disconnect.

2.02 SQUARE INLINE CENTRIFUGAL FANS (DIRECT DRIVE)

A. Manufacturers:
1. Greenheck SQ
2. Twin City Fan
3. Cook
4. Acme
5. PennBarry
6. Engineer approved equal.

B. Cabinet: Galvanized enclosure with duct mounting collars on inlet and outlet. A minimum of two sides shall be removable for fan and motor access. Provide inlet guards on units not connected to ductwork. Cabinet shall be lined with 1” fiberglass duct liner

C. Fan Wheel: Aluminum Backward inclined wheel that is statically and dynamically balanced to AMCA 204-205.

D. Motor:
1. Motor Enclosure: Open Drip Proof
2. Type: Electronic Commutation Motor (ECM) designed for fan applications. AC motors such as Permanent Split Capacitor type (PSC) are not acceptable.
3. Motors shall be permanently lubricated with heavy duty ball bearings.
4. Motor circuitry shall convert AC power supplied by the electrician to DC power acceptable by the ECM motor.
5. Turndown: Capable of running at 20% of full speed.
6. Control:
a. Potentiometer Dial mounted on the motor for constant volume balancing.

E. Dampers: Provide a factory installed gravity backdraft damper.

F. Isolation Supports: Neoprene/Rubber mount. Steel top plate. Base plate embedded in oil resistant neoprene. Mount sized by manufacturer based on unit weight.

G. Electrical Disconnect: Factory provided NEMA 1 disconnect compatible with ECM motor controls.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install fans with resilient mountings and flexible electrical leads.

B. Install flexible connections between fan inlet and discharge ductwork. Ensure metal bands of connectors are parallel with minimum one inch (1") flex between ductwork and fan while running.

C. Install fan restraining snubbers. Adjust snubbers to prevent tension in flexible connectors when fan is operating.

D. Provide sheaves required for final air balance.

E. Provide safety screen where inlet or outlet is exposed.

F. Pipe scroll drains to nearest floor drain.

G. Provide backdraft dampers on discharge of exhaust fans and as indicated.

H. Do not operate fans in normal operation until ductwork is clean, filters are in place, bearings are lubricated, and fan has been test run under observation.

3.02 SCHEDULES

A. See drawings.

END OF SECTION

SECTION 23 34 21
ENERGY RECOVERY VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Energy recovery ventilator (Small core, D/X cooling duct coil, electric duct heat)

1.02 RELATED SECTIONS

A. Specification Section 23 31 00 - HVAC Ducts and Casings.

B. Specification Section 23 33 00 - Air Duct Accessories.

C. Specification Section 23 2923 - Variable Frequency Drives

1.03 SYSTEM DESCRIPTION

A. Unit is capable of transferring sensible and latent energy as listed in the equipment schedule.

B. Unit is designed to be used as a stand-alone energy recovery ventilator or an energy recovery component in a dedicated HVAC system or as a complete ventilation/HVAC unit with the addition of optional heat/cool accessory modules.

C. Energy recovery wheel to be factory installed in unit.

1.04 QUALITY ASSURANCE

A. Unit shall be constructed in accordance with CSA C22.2 and UL 1995 and shall carry the ETLus and ETLc label of approval.

B. Insulation shall comply with NFPA 90A requirements for flame spread and smoke generation.

C. Airflow data shall comply with AMCA 210 method of testing.

D. All units shall be run tested prior to shipment.

1.05 DELIVERY, STORAGE HANDLING

A. Unit shall be stored and handled per unit manufacturer's recommendations.

1.06 REFERENCES

A. AMCA 99 - Standards Handbook

B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes

C. AMCA 261 - Directory of Products Licensed to Bear the AMCA Certified Ratings Seal

D. AMCA 300 - Test Code for Sound Rating Air Moving Devices

E. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices

F. NEMA MG1 - Motors and Generators

G. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease Vapors from Commercial Cooking Equipment

H. UL 705 - Power Ventilators

1.07 SUBMITTALS

A. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.

B. Manufacturer's Instructions: Indicate installation instructions.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.09 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 ENERGY RECOVERY VENTILATOR (SMALL CORE, D/X COOLING DUCT COIL, ELECTRIC DUCT HEAT)

A. Manufacturers:
   1. Renewaire
   2. Engineer approved equal.

B. Performance:
   1. Energy transfer shall be capable of transferring both sensible and latent energy between air streams. Latent energy transfer shall be accomplished by direct water vapor transfer from one air stream to the other without exposing transfer media in succeeding cycles directly to the exhaust air and then to the fresh air.
   2. Passive frost control energy-transfer element shall perform without condensing or frosting under normal operating conditions (defined as outside temperatures above –10 deg F and inside relative humidity below 40%). Occasional extreme conditions shall not affect the usual function or performance of the element. No condensate drains shall be required.
   3. Continuous ventilation unit shall have the capacity to operate continuously without the need for bypass, re-circulation, pre-heaters or defrost cycles under normal operating conditions.
   4. Positive air stream separation water vapor transfer shall be through molecular transport by hydroscopic resin and shall not be accomplished by “porous plate” mechanisms. Exhaust and fresh air streams shall at all times travel in separate passages, and air streams shall not mix.
   5. Laminar flow airflow through the energy exchange element shall be laminar, avoiding deposition of particulars on the interior of the energy exchange plate materials.
   6. Furnish and install electric duct heater, duct cooling coil, and air-cooled condensing unit. Interlock all to be enabled only when the ERV fan runs. Control fan by 7-day time clock with battery backup. Cycle ACCU by outdoor thermostat. Operate above 80 deg F outdoor air (adj). Cycle electric heat by outdoor thermostat. Operate below 35 deg F outdoor air (adj).

C. Substitutions: Energy recovery wheels may be considered as an equal. Manufacturers shall provide required electric defrost and controls. Manufacturer shall include all costs for required electrical changes in the bid.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure roof or wall exhausters with cadmium plated steel lag screws to roof curb or structure.

C. Extend ducts to roof or wall exhausters into roof curb or structure. Counterflash duct to roof or wall opening.

D. Provide sheaves required for final air balance.

E. Install backdraft dampers on inlet to roof and wall exhausters.

F. Do not operate fans until ductwork is clean, filters are in place, and bearings are lubricated.

G. If equipment is to be operated prior to building turn over to the owner, the mechanical contractor must install filter media on all return and exhaust grilles.

H. Install motorized control dampers on the intake and exhaust ducts serving the energy recovery ventilator.

3.02 SCHEDULES

A. See drawings.

END OF SECTION

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SECTION 23 34 23
HVAC POWER VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof exhausters

B. Cabinet and ceiling exhaust fans

1.02 RELATED SECTIONS

A. Specification Section 23 31 00 - HVAC Ducts and Casings

B. Specification Section 23 33 00 - Air Duct Accessories

C. Specification Section 23 34 16 - Centrifugal HVAC Fans

D. Specification Section 23 2923 - Variable Frequency Drives

E. Specification Section 23 0993 - Sequence of Operation for HVAC Controls

1.03 REFERENCES

A. AMCA 99 - Standards Handbook

B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes

C. AMCA 261 - Directory of Products Licensed to Bear the AMCA Certified Ratings Seal

D. AMCA 300 - Test Code for Sound Rating Air Moving Devices

E. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices

F. NEMA MG1 - Motors and Generators

G. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease Vapors from Commercial Cooking Equipment

H. UL 705 - Power Ventilators

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data indicating fan power, fan RPM, sound power levels, electrical characteristics, connection requirements, mounting recommendations and controller information.
      b. Shop Drawings indicating product dimensions, weight, and attachment methods.

C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Warranty documentation, fully filled out and including start-up and start date information.
      b. Operation and Maintenance Information

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Kitchen Range Hood Exhaust Fans: Comply with requirements of NFPA 96.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 ROOF EXHAUSTERS

A. Manufacturers:
   1. Greenheck
   2. Carnes
   3. PennBarry
   4. Loren Cook
   5. Twin City Fan
   6. Acme
   7. Soler and Palau
   8. JencoFan
   9. Engineer approved equal.

B. Product Requirements:
   1. Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal.
   2. Sound Ratings: AMCA 301, tested to AMCA 300 and bear AMCA Certified Sound Rating Seal.
   3. Fabrication: Conform to AMCA 99.
   4. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.

C. Performance: See drawings.

D. Fan Unit: V-belt or direct driven as indicated with spun aluminum housing; resilient mounted motor; 1/2 inch mesh, 16 gauge aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.

E. Roof Curb: Self-flashing (14 inch high) aluminum or galvanized steel in here noted with continuously welded seams, built-in cant strips, one inch (1") insulation and curb bottom, curb bottom and factory installed nailer strip. The roof curb is to be approved by the building supplier when used on a metal roof.

F. Disconnect switch:
   1. For thermal overload protected single phase motors or thermal overload protected 3-phase motors under 1 HP: Factory wired NEMA-1 non-fusible disconnect located within fan housing.
   2. For 3-phase motors above 1 HP or any motor without thermal overload protection: Factory provided NEMA-3 non-fusible disconnect to be factory wired and mounted to the fan casing.

G. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked. Where indicated on the drawings and schedules provide a powered back draft damper with line voltage motor drive, power open, and spring return. Verify voltage.

H. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

I. Provide kitchen hood up blast exhaust fans with grease trap and vented curb. Exhaust fan housing shall be hinged and the motor and belt drive shall be located out of the air stream.

J. Provide wall mounted solid state speed controller where indicated.

2.02 CABINET AND CEILING EXHAUST FANS

A. Manufacturers:
   1. Greenheck
   2. Soler and Palau
   3. Cook
   4. Carnes
   5. PennBarry
   6. Twin City Fan
   7. Acme
   8. Loren Cook
   9. Engineer approved equal.

B. Performance: See drawings.

C. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with 1/2 inch acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.

D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes and materials indicated.

E. Disconnect Switch: Cord and plug in housing for thermal overload protected motor.

F. Grille: Molded white plastic or aluminum with baked white enamel finish.

G. Sheaves: Steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

H. Provide wall mounted solid state speed controller where indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure roof or wall exhausters with cadmium plated steel lag screws to roof curb or structure.

C. Extend ducts to roof or wall exhausters into roof curb or structure. Counterflash duct to roof or wall or opening.

D. Hung Cabinet Fans:
   1. Install fans with resilient mountings and flexible electrical leads.
   2. Install flexible connections between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.

E. Provide sheaves required for final air balance.

F. Install backdraft dampers on inlet to roof and wall exhausters.

G. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans.

H. Do not operate fans until ductwork is clean, filters are in place, and bearings are lubricated.

I. Support ceiling fans from structure.

J. If equipment is to be operated prior to building turn over to the owner, the mechanical contractor must install filter media on all return and exhaust grilles. The contractor shall provide documentation that filters have been check on a daily basis.

3.02 EXAMINATION

A. Examine areas to receive fans. Notify the Design Team Engineer of conditions that would adversely affect installation or subsequent utilization and maintenance of fans.

3.03 SCHEDULES

A. See drawings.

END OF SECTION

SECTION 23 36 00
AIR TERMINAL UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single duct variable volume air terminal units

1.02 RELATED SECTIONS

A. Specification Section 23 09 23 - Direct Digital Control Systems for HVAC

B. Specification Section 23 0993 - Sequence of Operation

C. Specification Section 23 21 13 - Hydronic Piping.

D. Specification Section 23 31 00 - HVAC Ducts and Casings.

E. Specification Section 23 33 00 - Air Duct Accessories.

F. Specification Section 23 37 00 - Air Outlets and Inlets

1.03 REFERENCES

A. AHRI 880 - Performance Rating of Air Terminals

B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials

C. NFPA 70 - National Electrical Code

D. NFPA 90A - Installation of Air Conditioning and Ventilation Systems

E. UL 181 - Factory-Made Air Ducts and Connectors

F. AHRI 885 - Procedure for Estimating Sound Levels

1.04 PERFORMANCE TOLERANCES

A. Base performance on tests conducted in accordance with AHRI 880.

1.05 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, static pressure, and NC designation. Include electrical characteristics and connection requirements.
      b. Shop Drawings
      c. Installation Instructions indicating support and hanging details, and service clearances required.

C. Closeout submittal
   1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Warranty documentation, fully filled out and including start-up and start date information.
      b. Operation and Maintenance Information, including repair data and parts lists

D. Project Record Documents
   1. Indicate final installed locations of all components on a PDF floor plan

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.07 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by UL or ETL as suitable for the purpose specified and indicated.

1.08 WARRANTY

A. Provide parts and labor warranty for one year after system acceptance or 18 months after shipment from factory, whichever is sooner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Trane

B. Titus

C. Price Industries

D. Carnes

E. Nailor Industries

F. Krueger

G. Tuttle & Bailey

H. Enviro-Tec

I. Engineer approved equal.

2.02 MANUFACTURED UNITS

A. Constant and variable air volume air terminal units for connection to single or dual duct, central air systems.

B. Identify each terminal unit with clearly marked identification label and airflow indicator. Include unit nominal airflow, maximum factory set airflow, minimum factory set airflow, and coils type.

2.03 SINGLE DUCT VARIABLE VOLUME AIR TERMINAL UNITS

A. Basic Assembly:
   1. Casings: Minimum 22 gauge galvanized steel.
   2. Lining: Minimum one inch (1") thick elastomeric or vinyl coated fibrous glass insulation, 1.5 lb./cu ft or heavier density, meeting NFPA 90A requirements and UL 181 erosion requirements and bacteriological standard ASTM C665 and ASTM E 84 25/50. Fibers must be isolated from air stream using a fiber free lining or a vinyl or metal facing over the lining.
   3. Plenum Air Inlets: Round stub connections for duct attachment.
   4. Plenum Air Outlets: "S" slip and drive connections.

B. Basic Unit:
   1. Configuration: Air volume damper assembly inside unit casing.
   2. Volume Damper: Construct of galvanized steel with peripheral gasket and self-lubricating bearings; maximum damper leakage: 2% of design air flow at three inch inlet static pressure.

C. Electric Heating Coil:
   1. Construction: UL or ETL listed, slip-in type, open coil design, integral control box factory wired and installed with:
      a. Primary and secondary over-temperature protection.
      b. Minimum airflow switch.
      c. SCR with full range modulation responding to a 0 - 10 Vdc analog signal.

d. Non-fused door interlocking disconnect switch.

2. Electrical Characteristics: See schedule on drawings.

D. Sound:
1. The air terminal unit NC must not be higher than 35 at the scheduled maximum CFM at 1.0 in W.C. inlet pressure.
2. Select an air terminal unit larger than scheduled as needed to meet the maximum NC requirement.

E. Air Flow Sensing:
1. Provide a multiple point averaging velocity pressure measuring sensor in the air valve inlet. The sensor must be a velocity pressure amplifying design.
2. Provide taps on the total and static pressure lines for TAB to use to measure the pressures.

F. Controls: See Specification Section 23 0993 Sequence of Operation.

G. Factory Installed Controls:
1. The air terminal manufacturer must install the air terminal unit controller, the velocity pressure sensor (if separate from the controller), the air terminal unit controller enclosure and the air terminal unit damper actuator.
2. The air terminal manufacturer must wire the air terminal damper actuator and the velocity pressure sensor to the air terminal unit controller using CL2P cable that meets the FMS contractor's electrical requirements. The wiring connections must follow the FMS contractor's wiring diagram.
3. The air terminal manufacturer must wire the air terminal electric heat to the air terminal unit controller using CL2P cable that meets the FMS contractor's requirements. The wiring connections must follow the FMS contractor's wiring diagram.
4. The air terminal manufacturer must connect the air terminal air flow sensor to the velocity pressure sensor using plenum rated tubing.
5. The air terminal manufacturer must install the control devices, wiring and tubing at their own cost.
6. The FMS contractor must ship the air terminal unit controller, velocity pressure sensor (if a separate component), controller enclosure and damper actuator to the air terminal manufacturer's factory at the cost of the FMS contractor.
7. The FMS contractor must provide all wiring and tubing diagrams.

H. Provided and Installed by the Building Automation Contractor. See the Sequence of Operation (23 0993), Control Devices (23 0913) and the Control Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide ceiling access doors or locate units above easily removable ceiling components.

C. Support units individually from structure. Do not support from adjacent ductwork.

D. Connect to ductwork.

E. Provide minimum of five feet (5') of one inch (1") thick lined ductwork downstream of units. A discharge attenuator meets these requirements.

F. Install heating coils if required.

G. Verify that electric power is available and of the correct characteristics for air valves requiring electrical power.

3.02 SCHEDULES

A. See drawings.

END OF SECTION

SECTION 23 37 00
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Diffusers/registers/grilles

B. Stationary Louvers

C. Wind Driven Rain Louvers

D. Goosenecks

1.02 REFERENCES

A. AMCA 500L - Test Method for Louvers, Dampers and Shutters

B. AMCA 511 - Certified Ratings Program for Louvers

C. AHRI 880 - Air Outlets and Inlets

D. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets

E. SMACNA - HVAC Duct Construction Standard - Metal and Flexible

F. NFPA 70 - National Electrical Code

G. NFPA 90A - Installation of Air Conditioning and Ventilating Systems

1.03 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents
   4. Have options clearly indicated as applicable to each submittal

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data: Contractor shall review outlets and inlets as to size, finish, and type of mounting prior to submission. Review ceiling type and style before submitting.
      b. Schedule of outlets and inlets showing type, size, location, application, and noise level.

C. Project Record Documents
   1. Indicate final installed locations of all components on a PDF floor plan

1.04 QUALITY ASSURANCE

A. Test and rate air outlet and inlet performance in accordance with ASHRAE 70.

B. Test and rate louver performance in accordance with AMCA 500L and 511.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years experience.

PART 2 PRODUCTS

2.01 DIFFUSERS/REGISTERS/GRILLES

A. Manufacturers:
   1. Titus
   2. Carnes
   3. Tuttle & Bailey
   4. Price Ind.

5. Krueger
6. Nailor
7. Anemostat
8. Engineer approved equal.

B. Refer to schedule on drawings for style, size, and finish.

2.02 STATIONARY LOUVER

A. Manufacturers:
1. Ruskin #ELF Series
2. American Warming
3. Louvers and Dampers, Inc
4. Pottorff
5. Greenheck
6. United Enertech
7. Engineer approved equal

B. Description: Drainable stationary louver intended for intake and exhaust openings in exterior walls.

C. Construction
1. Material: Extruded Aluminum
2. Frame Thickness: 0.081”
3. Blade Thickness: 0.081”
4. Blade Style: Horizontal, drainable
5. Depth: See schedule
6. Size: See schedule

D. Accessories:
1. Bird Screen, aluminum
2. Extended Sill with end dams (match louver finish)
3. Mounting Clips

E. Performance: Per AMCA 500L and 511, see schedule for individual louver performance

F. Finish
1. AAMA 2605 Fluoropolymer at 2 mil thickness. 10 year warranty.
2. Color Selection: See schedule

2.03 WIND DRIVEN RAIN RESISTANT LOUVER

A. Manufacturers
1. Ruskin #EME Series
2. American Warming
3. Louvers and Dampers, Inc
4. Pottorff
5. Greenheck
6. United Enertech
7. Engineer approved equal

B. Description: Drainable wind driven rain resistant louver intended for intake and exhaust openings in exterior walls

C. Construction
1. Material: Extruded Aluminum
2. Frame Thickness: 0.081”
3. Blade Thickness: 0.081”
4. Blade Style: Horizontal or Vertical, drainable
5. Depth: See schedule
6. Size: See schedule

D. Accessories:
   1. Bird Screen, aluminum
   2. Extended Sill with end dams (match louver finish)
   3. Mounting Clips

E. Performance: Per AMCA 500L and 511 for Air, Water and Wind Driven Rain, see schedule for individual louver performance

F. Finish
   1. AAMA 2605 Fluoropolymer at 2 mil thickness. 10 year warranty
   2. Color Selection: See schedule

2.04 GOOSENECKS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, of minimum 18 gauge galvanized steel.

B. Mount on minimum 12 inch high curb base where size exceeds 9 inch x 9 inch.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position and type to conform to architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with airtight connection.

D. Provide balancing dampers on duct take-off to diffusers, grilles and registers, despite whether dampers are specified as part of the diffuser or grille and register assembly.

E. Paint ductwork visible behind air outlets and inlets matte black.

F. Provide a cable operated damper or access panel where a balancing damper is located above gypsum ceilings or in an inaccessable location. Externally cable operated damper shall be similar to Ruskin ZCDR25.

3.02 SCHEDULES

A. See drawings.

END OF SECTION

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SECTION 23 74 50
PACKAGED ROOFTOP UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufacturers
B. Unit casing
C. Air filters
D. Supply/exhaust fans
E. Gas heat
F. Evaporator coil
G. Condenser
H. Refrigerant system
I. Exhaust/return
J. Outdoor air
K. Dampers
L. DDC microprocessor controls
M. Miscellaneous features
N. Building management system

1.02 RELATED SECTIONS

A. Specification Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC
B. Specification Section 23 07 13 - Duct Insulation
C. Specification Section 23 09 13 - Instrumentation and Control Devices for HVAC
D. Specification Section 23 2923 - Variable Frequency Drives

1.03 REFERENCES

A. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation Systems
B. ARI 360 - Unitary Air-Conditioning Equipment
C. ANSI/ASHRAE 90A - Energy Conservation in New Building Design
D. ARI 370 - Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment
E. California Administrative Code - Title 24 Establishes the minimum efficiency requirements for HVAC equipment installed in new buildings in the State of California.

1.04 SUBMITTALS

A. Submit drawings indicating components, dimensions, weights and loadings, required clearances, and location and size of field connections.
B. Submit product data indicating rated capacities, weights, accessories, service clearances and electrical requirements.
C. Submit manufacturer's installation instructions.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data.
B. Include manufacturer's descriptive literature, start-up and operating instructions, installation instructions, and maintenance procedures.

1.06 HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

B. Protect units from physical damage. Leave factory shipping covers in place until installation.

1.07 WARRANTY

A. Provide a full parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.

B. Provide five year extended warranty for compressors including materials only.

C. Provide five year limited warranty for heat exchanger including materials only.

1.08 MAINTENANCE SERVICE

A. Furnish complete service and maintenance of packaged rooftop units for one year from Date of Substantial Completion by contractor.

B. Provide maintenance service with a two month maximum time interval between calls. Provide 24-hour emergency service on breakdowns and malfunctions.

C. Include maintenance items as outlined in manufacturer's operating and maintenance data.

D. Submit copy of service call work order or report to the owner, and include description of work performed.

1.09 ACOUSTICS

A. Manufacturer of packaged rooftop equipment shall provide indoor and outdoor sound power level data across all major octave band center frequencies for cataloged operating range of unit at gross cooling capacity range. Data shall be obtained in conformance with ANSI S1.32-1980, American National Standard Methods for the Determination of Sound Power Levels of Discrete Frequency and Narrow Band Noise Sources in Reverberation Rooms and per AMCA Standard 300-85 test code "Sound Rating Air Moving Devices".

1.10 REGULATORY REQUIREMENTS

A. Unit shall conform to UL 1995/CSA 22.2 #236 for construction of packaged air conditioner and shall have UL/CSA label affixed to rooftop package.

1.11 EXTRA MATERIALS

A. Provide one set of filters.

B. Furnish one complete set per applicable motor of fan motor drive belts.

1.12 SUMMARY

A. The contractor shall furnish and install packaged rooftop air conditioning unit(s) as shown and as scheduled on the contract documents. The unit(s) shall be installed in accordance with this specification and perform at the conditions specified, scheduled or as shown on the contract drawings.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The manufacturer of packaged unitary rooftop products shall have had a minimum of five-years successful experience in the manufacture and service support of the rooftop packages specified herein. Manufacturers with less than five-years experience in the production of rooftop units of the sizes and types specified shall not be acceptable.

B. Approved Manufacturers:
   1. Trane
   2. Carrier
   3. McQuay
   4. Engineer approved equal.

2.02 GENERAL UNIT DESCRIPTION

A. Unit(s) furnished and installed shall be cooling only packaged rooftops as specified on the contract documents and within these specifications. Cooling capacity ratings shall be based upon ARI Standard 360. Unit(s) shall consist of insulated weathertight casing with compressors, air cooled condenser coil, condenser fans, evaporator coil, filters, supply and/or exhaust fan motors and drives, and unit controls.

B. Unit(s) shall be single piece construction as manufactured at the factory. Site assembled sub-assemblies will not be allowed. Package units shall be constructed for installation on a roof curb providing full perimeter support under air handler section and pedestal support under condenser section.

C. Unit(s) shall be factory run tested to include the operation of all fans, compressors, heat exchangers, and control sequences.

D. Unit(s) shall have labels, decals, and/or tags to aid in the service of the unit and indicate caution areas.

2.03 UNIT CASING

A. Cabinet: Galvanized steel, phosphatized, and finished with an air-dry paint coating durable enough to withstand 1000 consecutive hours of salt spray application in accordance with standard ASTM B 117. Structural members shall be 14 gauge with access doors and removable panels of minimum 18 gauge steel. Roof panels shall be sloped to provide positive drainage of rain water/melting snow away from the cabinet.

B. Access Doors: Fully gasketed hinged doors with fluted knob fasteners and chained "tie-backs" to provide access to filters, heating section, return/exhaust air fan section, supply air fan section, and evaporator coil section.

C. Control Panel: The unit control panel section shall be compartmented to separate high and low voltage components. The control panels shall also be fully gasketed, hinged, and provided with quick release latches for easy access.

D. The high voltage control panel shall be provided with a door handle disconnect switch to facilitate convenient, safe disconnection of main three-phase power.

E. Insulation: Provide 1/2 inch thick coated fiberglass internal liner on all exterior panels in contact with the conditioned air stream.

2.04 AIR FILTERS

A. Filters shall mount integral within unit casing and be accessible via hinged access panels. Filters shall be two inch (2") thick washable permanent wire mesh with metal frame.

2.05 SUPPLY/EXHAUST FANS

A. Provide forward curved supply/exhaust fans with fixed-pitch sheave drive assemblies. Dynamically balance all fans and the unit's running fan assembly (fan mounted on actual shaft, bearings and in scroll housing) to assure smooth operation of the fan and it's associated assembly. Balancing of the fan only shall not be acceptable.

B. Mount fan motor(s) and fan on a common base assembly and isolated from unit with double deflection rubber-in-shear isolators. Provide thrust restraint isolation on the fan housing/fan board to assure smooth fan startup transition and operation.

C. Fan shaft shall be mounted on grease lubricated ball bearings.

D. Motor shall be open drip-proof. Motor shall have a standard T-frame and a minimum service factor of 1.15. All drive components shall be accessible without the use of scaffold or ladders, to facilitate periodic maintenance checks and for operator safety.

2.06 GAS HEAT

A. Provide complete indirect natural gas heating with electronic ignition, power vent and fully modulating with 6 to 1 turn down ration.

B. Provide factory-mounted non-fused disconnect switch.

2.07 EVAPORATOR COIL

A. Provide heavy duty aluminum fins mechanically bonded to copper tubes. Evaporator coil shall be inter- circuited to maintain active coil face area at part load conditions. Coil shall also utilize internally enhanced tubing for maximum efficiency.

B. Provide a thermostatic expansion valve (TXV) for each refrigerant circuit. Factory pressure and leak test coil at 300 psi.

C. Provide pitched stainless steel drain pan to assure positive drainage of condensate from the unit casing.

2.08 CONDENSER

A. Provide heavy duty aluminum fins mechanically bonded to copper tubes. Factory leak test coil under 450 psi pressure.

B. Provide subcooling circuit(s) integral with condenser coils to maximize efficiency and prevent premature flashing of liquid refrigerant, to a gaseous state, ahead of the expansion valve.

C. Provide vertical discharge, direct drive fans with steel blades, and three-phase motors. Fans shall be statically and dynamically balanced. Motors shall be permanently lubricated with built-in current and thermal overload protection in a weather tight slinger over motor bearings.

D. Furnish unit with factory-installed electronic low ambient option to allow for operation down to 0 deg F.

E. Provide factory installed, louvered, steel coil guards around perimeter of condensing section to protect the condenser coils, refrigerant piping, and control components. Louvered panels shall be fabricated from minimum 20 gauge galvanized steel and be rigid enough to provide permanent protection for shipping and pre/post installation. Course wire mesh is not an acceptable material for coil guards.

F. Condenser coils shall be V-banked for cleaning ease. The coils shall not exceed 14 fins per inch density in order to permit routine cleaning, and prevent excessive air pressure drop across the condenser coil.

2.09 REFRIGERATION SYSTEM

A. Compressor shall be industrial grade, energy efficient direct drive 3600 RPM maximum speed reciprocating or scroll type. The motor shall of a suction gas cooled hermetic design. Compressor shall have centrifugal oil pump with dirt separator, oil sight glass, and oil charging valve.

1. If semi-hermetic reciprocating industrial grade compressors are utilized provide single piece crankshaft, connecting rods aluminum pistons, rings to prevent gas leakage, high strength non-flexing ring type suction and discharge valves, spring loaded heads, replaceable cylinder liners, and sealing service immersed in oil. Provide removable discharge heads and hand hole covers, and discharge service valves.
2. Provide compressor with automatic capacity reduction equipment consisting of suction valve unloaders. Use electric solenoid actuated lifting mechanism operated by oil pressure. Provide for unloaded compressor start.
3. Provide with thermostatic motor winding temperature control to protect against excessive motor temperatures resulting from over-/under-voltage or loss of charge. Provide high and low pressure cutouts, and reset relay.
4. Provide factory installed compressor lockout thermostat to prevent compressor operation at low ambient conditions.
5. Provide coil frost protection compressor unloading based on refrigerant circuit suction temperature to prevent coil frosting with minimum energy usage. As an alternate, factory-installed hot gas bypass shall be required on all VAV units to prevent coil frosting.

2.10 EXHAUST/RETURN

A. Provide 100% modulating exhaust air capabilities integral to unit. Unit shall control building pressurization by the operation of exhaust fans and modulation of discharge dampers. Controller shall compare actual building interior pressure with outside ambient air pressure and supply duct pressure. Pressurization setpoint shall be field adjustable at the human interface to positive, neutral or negative values.

2.11 OUTDOOR AIR

A. Provide 100% modulating enthalpy-based economizer system fully integrated with unit return and exhaust air dampers. Unit operation is through primary temperature controls that automatically modulate dampers to maintain desired space temperature conditions.

B. Provide automatic outdoor enthalpy lockout sensor.

C. Provide adjustable minimum position control through the standard rooftop Human Interface (HI).

D. Provide spring-return motor for outside air damper closure during unit shutdown or power interruption.

2.12 DAMPERS

A. Provide low leak dampers with a leakage rate not to exceed 2.5% of nominal airflow at one inch (1") wc. static pressure.

B. Leakage rate shall be determined in accordance with AMCA Standard 575.

2.13 DDC MICROPROCESSOR CONTROLS

A. Each unit shall be provided with a factory installed, programmed and run tested, stand alone, microprocessor control system suitable for CV or VAV control as required. This system shall consist of temperature and pressure (thermistor and transducer) sensors, printed circuit boards, and a unit-mounted Human Interface (HI) Panel. The microprocessor shall be equipped with on board diagnostics to indicate that all hardware, software, and all interconnected wiring and sensors are in proper operating condition. The microprocessors memory shall be non-volatile EEPROM type, thus requiring no battery or capacitive backup to maintain all data during a power loss.

B. The Human Interface (HI) Panel shall be readily accessible for service diagnosis and programming without having to open the main control panel on the rooftop unit. Alphanumeric coded displays shall not be acceptable.

C. The Human Interface (HI) Panel shall be a 16-key touch sensitive membrane key switch panel, password protected to prevent use by unauthorized personnel. The Human Interface (HI) Panel display shall consist of a two line by 40 characters per line clear english display. The display shall be Supertwist Liquid Crystal Display (LCD) with blue characters, 5 x 7 dot matrix with cursor, on a gray-green background for high visibility and reading ease.

D. Anti-recycle protection shall be provided to prevent excessive cycling, and premature wear of the compressors, contactors, and related components.

E. Generic Building Automation System (GBAS) module shall be provided to allow interface with a generic BAS system. The module shall provide a minimum of five binary outputs and accept a minimum of four analog inputs. The module shall provide a two-step demand limiting upon a contact closure from an external signaling source.

F. Airflow modulation shall be provided by a variable frequency drive with bypass that is factory-mounted, completely wired, and functionally tested. Adjustable frequency inverter drive shall safely vary the speed of the fan motor allowing the motor to meet the dynamic requirements at the shaft of the motor and meet the system static. Properly sized motor protection shall be provided in both drive and bypass modes by a motor overload relay and fuses. Inverter controller shall have a display that provides readout functions that include: output frequency, output voltage, output current, output power, DC bus voltage, interface terminal status, and fault status. In the bypass mode, an output signal shall be available for a building automation

system to make system adjustments to prepare for an across the line start of a fully loaded fan. A run command signal to the bypass motor starter shall be provided by the unit controller.

2.14 MISCELLANEOUS FEATURES

A. Remote Setpoint: Provide potentiometer for VAV/CV units to allow for remote setting of the discharge air setpoint.

B. Horizontal discharge: Provide field removable access panels to allow for horizontal discharge and/or return applications without the use of a special roof curb.

C. Provide two manual re-set firestats, one located in the discharge section of the unit set at 240 deg F and the other in the return air section of the unit set at 135 deg F. Firestats shall shut down rooftop unit upon attaining set point.

D. Provide unit mounted 115 volt convenience outlet

E. Provide phase monitoring to protect against phase loss and phase reversal.

F. Provide unit with single point power connection.

2.15 BUILDING MANAGEMENT SYSTEM

A. Provide factory mounted Tracer Building Automation System control interface to operate with the Tracer 100 Series building management system. Communication link shall use a two-wire twisted pair.

B. Provide generic DDC system interface module with discharge air re-set and VAV control. This manufacturer shall provide field contractor to properly configure unit operation to accomplish the Sequence of Operation.

C. Control Functions: Includes unit time scheduling, occupied/unoccupied mode, optimal start/stop, night-time free-cooling purge mode, two-step demand limiting, night setback, morning warmup, discharge air set point adjustment, universal smoke purge, building pressurization, timed override and alarm shutdown.

D. Diagnostic Functions Shall Include:
1. RTM temp sensor fail.
2. Heat failure.
3. Supply air temp sensor fail.
4. Unocc zone cool stop fail.
5. RTM auxiliary temperature sensor fail.
6. Unocc zone heat stop fail.
7. Outside air temperature sensor failure.
8. Supply air pressure stop fail.
9. Mode input failure.
10. Spc static press stop fail.
11. OCC zone cool setpoint fail.
12. Space press sensor fail.
13. OCC zone heat setpoint fail.
14. Return air temperature sensor fail.
15. Supply air pressure sensor fail.
16. Return air humidity sensor fail
17. Outside air humidity sensor fail.
18. Supply air static press limit.
19. Emergency stop.
20. SCM communications fail.
21. Supply fan fail.
22. MCM communications fail.
23. Exhaust fan fail.
24. Heat module comm fail.

25. Evaporator temperature sensor fail.
26. ECEM communications fail.
27. Evaporator temperature sensor fail - Ckt 1.
28. temperature sensor fail - Ckt 2.
29. GBAS module communication fail.
30. TCI module communication fail.
31. Low press control open.
32. Low press control open - Ckt 1.
33. Low press control open - Ckt 2.
34. Tracer communications fail.
35. NSB panel communications.
36. Remote HI communications fail.
37. Cond temp sensor fail.
38. Cond temp sensor fail - Ckt 1.
39. Cond temp sensor fail - Ckt 2.
40. Unit HI communications fail.
41. VOM communications fail.
42. Compressor contactor fail.
43. Comp. contactor fail - Ckt 1.
44. Comp. contactor fail - Ckt 2.
45. Compressor trip.
46. Compressor trip - Ckt 1.
47. Compressor trip - Ckt 2.
48. Supply air temp cool stpt fail.
49. Supply air temp heat stpt fail.
50. Morning warmup zone sensor fail.
51. Freezestat trip.
52. Dirty filter.
53. NSB panel zone temp sensor fail.

E. Provide capabilities for Boolean Processing and trend logs as well as "templated" reports and logs.

F. Building automation system (BAS) control shall provide the capability to "read" and sum air flows, in CFM, for user selected VAV terminal boxes.

G. BAS control shall permit auto reset of latching diagnostics.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.

B. Verify that proper power supply is available.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork. Install roof mounting curb level.

3.03 MANUFACTURER'S FIELD SERVICES

A. Manufacturer shall furnish a factory trained service engineer without additional charge to start the unit(s). Package rooftop unitary manufacturers shall maintain service capabilities no more than 100 miles from the jobsite.

B. The manufacturer shall furnish an alternative price for:
1. Extended compressor warranty for one years.

2. Extended heat exchanger warranty for five years.

C. The manufacturer shall furnish complete submittal wiring diagrams of the package unit as applicable for field maintenance and service.

3.04 SCHEDULE

A. Equipment RTU-1, RTU-2, RTU-3
B. Location
C. Model Numb
D. Supply Fan
E. Air Flow Control
F. External
G. Fan Motor
H. Exhaust Fan
I. Air Flow Control
J. External
K. Fan Motor
L. Cooling Data
M. Total MBH
N. Sensible
O. Evap Coil
P. Evap Coil
Q. Evap Coil
R. Evap Coil
S. Condenser
T. EER
U. Heating Data
V. Input MBH
W. Output MBH
X. Outdoor Air
Y. Indoor Source
Z. Nominal Cable
AA. Voltage/Phase
BB. MCA
CC. Operating

3.05 SEQUENCE OF OPERATIONS

A. Packaged Rooftop Air Conditioning Unit:
   1. Each Commercial Rooftop Unit shall have a microprocessor- based controller which shall monitor and control the commercial rooftop unit in a stand-alone mode or as directed by the building automation system. The rooftop control panel shall have a human interface panel with a two-line by 40-character clear English LCD display and a 16 button keypad for monitoring, setting, editing and controlling.
   2. The Building Automation System (BAS) shall perform the following rooftop control strategies, provide the points listed on the point list and provide the specified monitoring and diagnostics.

a. Unoccupied Mode: When the BAS initiates the Unoccupied mode, the rooftop shall assume the unoccupied heating and cooling setpoints. If the unoccupied setpoints are exceeded, the unit shall heat or cool until the zone temperature is within the unoccupied setpoints.
    1) Night Setback Temperature Control: During unoccupied hours, the rooftop unit shall be controlled by the BAS to maintain user-defined unoccupied heating and cooling setpoints. The outdoor air damper shall remain closed for night setback operation (unless economizing for zone cooling). The fan shall operate in the automatic control mode.
    2) Purge/Night Economizer: The purge mode shall turn on the fan and enable the economizer during unoccupied hours to cool a zone using cool night outdoor air. Through the BAS time of day scheduling, the operator shall specify when the purge mode occurs. During the purge mode, the economizer shall be enabled while mechanical outdoor cooling and heating are disabled.

b. Transition from Unoccupied to Occupied: When the unit transitions from the unoccupied operation to occupied operation, start up or morning warm up mode shall be activated.
    1) Startup Mode: The rooftop unit can be controlled to the start up mode by the BAS for optimal start purposes. During the start up mode, heating and cooling are enabled for the rooftop. On variable air volume units, the transition from the unoccupied to the startup mode may initiate the morning warm up mode, if the space temperature is below the morning warmup setpoint. On both constant volume and variable air volume units, the outdoor air damper shall remain closed, unless economizing, until the zones scheduled occupied time.
    2) Morning Warmup (CV and VAV Units): When the rooftop shall change from the unoccupied to the occupied mode, the unit may enter the morning warmup mode. The morning warmup mode shall be initiated if the morning warmup sensor value is less than the morning warmup setpoint. The economizer (if supplied) shall be kept closed and the selected zone is heated. The BAS shall send the rooftop unit a morning warmup temperature and setpoint. The morning warmup setpoint shall be based on one specific zone designated by the operator or based on an average zone temperature.

c. Occupied Operation: When the rooftop unit is controlled to the occupied mode, all rooftop unit functions shall be enabled. Variable air volume units shall operate in supply air temperature control mode, and constant volume units shall operate under zone temperature control. The rooftop unit shall default to this mode in the event that communications with the BAS are lost.
    1) Cooling/Economizer: During the occupied cooling mode of operation the economizer, if available, and mechanical cooling are used to control the supply air temperature. If the enthalpy of the outdoor air is appropriate to use free cooling the economizer shall be used to satisfy the supply air setpoint. If more cooling is then required, compressors shall be staged on as necessary. Minimum on/off timing of the compressors shall prevent rapid cycling. If the unit does not include an economizer, mechanical cooling only shall be used to satisfy cooling requirements. At outdoor air conditions above the enthalpy control setting, mechanical cooling only shall be used and the fresh air dampers shall remain at minimum position.
    2) Supply Air Setpoint (VAV Units): The supply air setpoint for each rooftop unit shall be defined by the user at the BAS or reset automatically based on an outdoor air or zone temperature.

d. Daytime Warm Up (VAV Units): When the zone temperature drops below an operator-specified Daytime Warmup setpoint, the rooftop shall enter the Daytime Warmup mode. In this mode, the rooftop shall supply heat to the VAV boxes by driving the VAV boxes fully open and the inlet guide vanes or variable frequency drive(s) are driving to 100 percent. After the zone is warmed up, the unit shall resume

normal cooling. The BAS shall communicate the Daytime Warmup temperature value for the Rooftop to use to initiate the necessary heating for the zone.

e. Multiple Unit Zone Control (CV Units): When multiple rooftop units are supplying a common area, the BAS shall provide heat/cool arbitration for all of the units in that common area. This shall ensure that simultaneous heating and cooling do not occur when multiple units are serving a common area.
f. Economizer Control (CV and VAV Units): The BAS shall override the economizer controller on the rooftop unit to provide free cooling. If poor outdoor air conditions exist, the BAS shall lockout all economizers. On constant volume units the BAS shall also set the minimum economizer position to maintain a minimum outdoor air flow (cfm). On VAV units, as the supply fan modulates down, the minimum economizer position shall also be reset to compensate for the reduction in total airflow.
g. Demand Limit: The BAS will automatically turn off loads when it predicts that electrical demand will exceed specified limits. The operator can assign priority for each load to be turned off. The capacity can be reduced to 50% or zero mechanical cooling or heating. Ventilation can be set up as Enabled or Disabled in the Demand Limit mode. The fan can be set up as "on" or "auto" for constant volume unit. The BAS can also apply setpoint offsets to the current heating and cooling setpoints for constant volume units during the Demand Limit mode.
h. Ventilation Override: The operator shall be able to customize up to five different override sequences to provide ventilation override control. The BAS control of the ventilation override mode shall be used to coordinate the entire HVAC system in response to system ventilation requests. If more than one ventilation override sequence is requested, the sequence with the highest priority shall be initiated by the rooftop unit control.
i. Timed Override: When a timed override is initiated by the user, the rooftop unit shall return to its normal occupied mode for a period of time as specified at the BAS. When the timed override period has ended, the unit shall automatically return to its unoccupied cycle. The BAS shall monitor and store the override time for each Timed Override input for documentation of after-hours operation. The BAS shall also recognize a timed override function if provided.
j. Mode: Before the rooftop unit is controlled to the unoccupied mode, the BAS shall initiate the coast down or optimal stop mode. During the optimal stop mode, the supply fan shall remain on, the outdoor air damper shall remain open for ventilation, and the mechanical cooling and heating shall be disabled. The unit shall remain in the coast down mode until the scheduled unoccupied time. The BAS shall turn equipment off as early as possible before the unoccupied time to reduce energy consumption, while still maintaining comfort in the zone.
k. Shutdown: The BAS Priority Control program shall be able to put the zone in either the shutdown or occupied mode. All units which are members of that zone shall be immediately put in the shutdown or occupied mode. In the shutdown mode, the unit shall turn off as rapidly as possible with all cooling and heating disabled and the outdoor air damper shall be closed.
l. Space Pressure Control: The space pressure control shall turn the exhaust fans on and off, and shall modulate the exhaust dampers to maintain a slightly positive indoor static pressure. The BAS shall also control multiple units in a common area to provide uniform static pressure. The BAS shall also monitor the building static pressure sensor differential.
m. Supply Air Pressure Control (VAV Units): The BAS shall send supply air pressure setpoints to the rooftop to modulate the Inlet Guide Vanes or Variable Frequency Drive(s) based on the static pressure sensor located in the supply air duct. The BAS shall also read the status on the supply air sensor and display the pressure reading on the status screen.
n. Minimum Outdoor Air Control (VAV Units): The Ventilation Control Module shall be linked to the rooftop microprocessor-based unit controller. Using a velocity pressure

sensing ring, the ventilation control module shall monitor and control the quantity of fresh air entering the unit. The building automation system shall send the CCFM setpoint to the unit and shall then monitor that setpoint to ensure that it is maintained.

o. An optional temperature sensor shall be connected to the ventilation control module to enable it to control a field-installed pre-heater.
p. An optional CO2 sensor shall be connected to the ventilation control module to control CO2 reset.
q. The fresh outdoor air shall enter the rooftop unit through the air flow monitoring station/damper sensor assembly and shall be measured by velocity pressure flow rings. The velocity pressure flow rings shall be connected to a pressure transducer/solenoid assembly. The ventilation control module shall utilize the velocity pressure input, the outdoor air temperature input, and the minimum outdoor air CFM setpoint to modify the volume (CFM) of fresh air entering the unit as the measured airflow deviates from setpoint. When the optional temperature sensor is installed and the preheat function is enabled, the sensor shall monitor the combined (averaged) fresh air and return air temperatures. As this mixed air temperature falls below the preheat Actuate Temperature Setpoint, the ventilation control module shall activate the preheat binary output used to control a field installed heater. The output shall be de-activated when the temperature rises five above the Preheat Actuate Temperature Setpoint. When the optional CO2 sensor is installed and the CO2 Reset is enabled, as the CO2 concentration increases above the CO2 Reset Start Value, the Ventilation Control Module shall modify the minimum outdoor air CFM setpoint to increase the amount of fresh air entering the unit. The setpoint shall be adjusted upward until the CO2 Maximum Reset value is reached. The maximum effective (reset) setpoint value for fresh air entering the unit is limited to the maximum rated air flow for the unit. As the CO2 concentration decreases, the effective (reset) setpoint value shall be adjusted downward toward the minimum outdoor air CFM setpoint.

3. Unit Status Report for each Rooftop Unit: The BAS shall provide an operating status summary of the following information to provide the operator with critical rooftop operating data.
   a. Unit type and size.
   b. Operating mode.
   c. Active rooftop diagnostics.
   d. Active cooling/heating mode.
   e. Active cooling/supply air setpoint.
   f. Active heating/supply air setpoint.
   g. Supply air temperature.
   h. Space temperature.
   i. Supply fan status.
   j. Supply fan percent modulation.
   k. Exhaust fan status.
   l. Exhaust fan percent modulation.
   m. Active space pressure.
   n. Active supply air pressure.
   o. Hydronic heat output.
   p. Heat stage on/off status.
   q. Compressor on/off status.
   r. Condenser on/off status.
   s. Return air temperature.
   t. Return air relative humidity.
   u. Economizer status.
   v. Economizer position - percent.
   w. Minimum outdoor air CCFM setpoint.
   x. Carbon Dioxide concentration - percent (optional).

y. Outdoor air flow.

4. Diagnostics: The BAS system shall be able to alarm from all sensed points from the rooftop units and diagnostic alarms sensed by the unit controller. Alarm limits shall be designated for all sensed points.
   a. Individual rooftop diagnostic and alarm statuses shall include the following latching items for each rooftop unit:
      1) Emergency stop.
      2) Supply fan failure.
      3) Exhaust fan failure.
      4) Compressor trip (each circuit).
      5) Freezestat trip.
      6) Manual supply air static pressure limit.
      7) Compressor contactor fail (each circuit).
   b. Individual rooftop diagnostic and alarm statuses shall include the following non-latching items for each rooftop unit:
      1) Zone temperature sensor failure.
      2) Supply air temperature sensor failure.
      3) Auxiliary temperature sensor failure.
      4) Outdoor air temperature sensor failure.
      5) Occupied zone cool/heat setpoint failure.
      6) Supply air pressure sensor failure.
      7) Outdoor air humidity sensor failure.
      8) Evaporator temperature sensor failure (each circuit).
      9) Condenser Temperature sensor failure (each circuit).
      10) Morning warm-up zone sensor fail.
      11) Heat failure.
      12) Unoccupied zone cool/heat setpoint failure.
      13) Supply air pressure setpoint failure.
      14) Space static pressure setpoint failure.
      15) Space pressure sensor failure.
      16) Return air temperature sensor failure.
      17) Return air humidity sensor failure.
      18) Auto supply air static pressure limit.
      19) Unit communications loss.
      20) Heat communications failure.
      21) Night setback panel communications failure.
      22) Ventilation override mode communications loss.
      23) Supply air temperature cool/heat setpoint fail.
      24) Dirty filter.
      25) Night setback zone temperature sensor fail.

END OF SECTION

SECTION 23 81 24
COMPUTER ROOM AIR CONDITIONING UNIT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floor mounted unit

B. Microprocessor controls

C. Leak detection system

1.02 REFERENCES

A. ASHRAE 52 - Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter

B. ASME SEC 8D - Boilers and Pressure Vessel Codes - Rules for Construction of Pressure Vessels

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)

D. NFPA 70 - National Electrical Code

E. NFPA 75 - Protection of Electronic Computer/Data Processing Equipment

F. NFPA 90A - Installation of Air Conditioning and Ventilation Systems

G. UL - Underwriters Laboratories

1.03 SUBMITTALS

A. Shop Drawings: Indicate manufactured products and assemblies. Indicate water, drain, refrigeration, rough-in connections, and electrical characteristics and connection requirements.

B. Product Data: Provide for manufactured products and assemblies. Indicate water, drain, refrigeration, rough-in connections, and electrical characteristics and connection requirements

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience. The specified system shall be factory tested prior to shipment.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience

1.05 REGULATORY REQUIREMENTS

A. Conform to NFPA 90A for the installation of computer room air conditioning units.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.06 WARRANTY

A. Provide five (5) year warranty on refrigeration compressors.

B. Provide one (1) year limited warranty on computer room air conditioning units.

1.07 EXTRA MATERIALS

A. Provide one (1) set of filters from the factory and provide one (1) additional set of filters at substantial completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Liebert

B. Data Aire

C. Stultz

D. Engineer Approved Equal.

2.02 FLOOR MOUNTED UNIT

A. Description: Units shall include an indoor cabinet and frame for floor mounted installation, blower section, filter section, cooling coil, reheat coil, humidifier, controls, and interconnecting piping internal to the unit. Units shall be factory assembled, piped, wired, and factory tested prior to shipment. Unit shall be upflow or downflow orientation.

B. Indoor Cabinet and Frame:
   1. Frame shall be constructed of welded tubular steel with minimum 20 gauge powder coated galvanized steel panels. Panels shall be insulated with minimum of 1" thick closed cell insulation. Refer to drawings for required cabinet configuration.
   2. Cabinet shall have complete front and side access with removable side panels or hinged doors. Doors shall have gasketing to prevent air leakage.

C. Blower Assembly: Single width, single inlet direct drive plenum fan with backward inclined blades and ECM motor. Refer to drawings for required airflow configuration.

D. Evaporator Coil: Coil constructed with copper tubes and hydrophilic coated aluminum fins with external equalized expansion valve, and filter drier. Evaporator coil can be used with a ceiling mounted condensing unit or mounted remotely. Coil shall be provided with a stainless steel condensate drain pan with a factory installed float switch. Provide with factory charge of R454B.

E. Compressor:
   1. Modulating digital scroll compressor with capacity modulation from 20-100%. The compressor motor shall have a suction gas cooled motor, vibration isolators, internal thermal overloads, high and low pressure safety switches, crankcase heater, liquid line filter drier, liquid solenoid valve and refrigerant sight glass with moisture indicator. Compressor shall be removable and serviceable from the front of the cabinet.
   2. Electronic expansion valve to control the flow of liquid refrigerant entering the evaporator coil.
   3. Provide compressor with closed cell insulated sound jacket.

F. Condenser:
   1. Outdoor Air Cooled: Components shall include a microchannel condenser coil with aluminum tubes and fins, direct drive propeller condenser fans with ECM motors, head pressure control valve, high and low pressure safety switches, hot gas bypass system, refrigerant receiver, and liquid line solenoid valve. Condensing unit shall be designed for operation between -30F and 105F.
   2. Coil assembly shall be factory leak tested at a minimum of 300 psig.
   3. Refrigerant piping between the indoor evaporator and condenser shall be provided by the mechanical contractor.
   4. Factory mounted disconnect wired to the electrical control panel.

G. Electric Reheat
   1. Low watt density stainless steel finned tubular electric element. SCR control shall proportionally control the heating element.
   2. UL safety switches to prevent overheating.

H. Filters shall be integral to the unit located in the cabinet. Filters shall be 2” thick pleated MERV 8. Include a filter differential switch to indicate when a filter needs replacement.

I. Electrical
   1. Disconnect switch: Provide units with factory installed and wired disconnect switch.
   2. Indoor split systems shall be provided with separate power connections for the evaporator and condensing unit.

J. Accessories
   1. Condensate Pump: 5 GPM at 40 feet of head shipped loose with integral float switch for field installation by the mechanical contractor.

2.03 MICROPROCESSOR CONTROLS

A. Control system shall be microprocessor based consisting of an LCD wall mounted display, remote temperature and humidity sensors, and a unit mounted control board.

B. All control wiring shall be furnished by the unit manufacturer and installed by the mechanical contractor.

C. See Section 23 0993 Sequence of Operation for additional requirements.

2.04 LEAK DETECTION SYSTEM

A. System shall be equal to Liqui-Tect #460.

B. Provide 25 foot of flexible leak detection cable for zone monitoring and connect directly to computer room unit.

C. Selectable latching/non-latching alarms; power is disconnected from leak detection cable during latched alarms.

D. One-hour alarm re-test delay; power disconnected from leak detection cable during re-test delay.

E. Supervised operation signals on leak detected, circuit failure, cable fault, or power loss.

F. Dry contacts to connect to DDC temperature control system.

G. Power: 24 vac, 60 Hz, 0.12 amp.

H. Top cover LED's for system normal, alarm pending, and leak detected.

I. Top cover reset button.

J. Selectable leak detect filter delay (10 seconds or 2 minutes).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that flooring system is ready to receive work and opening dimensions are as instructed by the manufacturer.

B. Verify that proper power supply is available and of the correct characteristics.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install and connect devices furnished by the manufacturer but not factory mounted.

3.03 MANUFACTURER'S FIELD SERVICES

A. Set initial temperature and humidity setpoints. Instruct operating personnel.

B. Provide factory startup services.

3.04 SCHEDULES

A. See performance on drawings.

END OF SECTION

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SECTION 23 81 26
DUCTLESS SPLIT SYSTEM UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single zone unit

1.02 RELATED SECTIONS

A. Specification Section 23 0993 - Sequence of Operation for HVAC Controls

B. Specification Section 23 2300 - Refrigerant Piping

1.03 REFERENCES

A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment

B. AHRI 270 - Standard for Sound Performance Rating of Outdoor Unitary Equipment

C. AHRI 365 - Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning Condensing Units

D. ASHRAE 15 - Safety Standard for Refrigeration Systems

E. ASHRAE 90.1 - Energy Standard for Buildings except Low-Rise Residential Buildings

F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)

G. NEMA MG 1 - Motors and Generators

H. NFPA 70 - National Electrical Code

I. UL 207 - Refrigerant-Containing Components and Accessories, Non-Electrical

J. UL 1995 - Heating and Cooling Equipment

1.04 SUBMITTALS

A. Product Data: Provide typical catalog of information including rated capacities, furnished specialties, accessories, and arrangements.

B. Shop Drawings:
   1. Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations.
   2. Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, and comparison of specified heat required to actual heat output provided.
   3. Indicate mechanical and electrical service locations and requirements.

C. Manufacturer's Instructions: Indicate installation instructions and recommendations.

D. Project Record Documents: Record actual locations of components and locations of access doors in radiation cabinets required for access or valve.

E. Operation and Maintenance Data: Include manufacturer’s descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.

F. Warranty: Submit manufacturer's warranty and ensure forms have been completed in owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA70, Article100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Energy-Efficiency Ratio and Coefficient of Performance: Equal to or greater than prescribed by ASHRAE90.1.

D. The system components must be tested in accordance with the AHRI standard that applies to the particular component. All outside unit sound data presented must be determined using AHRI 270 methods.

1.06 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc. or ETL, as suitable for the purpose specified and indicated.

1.07 WARRANTY

A. Provide five-year manufacturer’s parts and defects warranty from time of installation.

PART 2 PRODUCTS

2.01 SINGLE ZONE SYSTEM

A. Manufacturers
   1. Daikin
   2. Fujitsu
   3. Friedrich
   4. LG
   5. Mitsubishi
   6. Panasonic
   7. Samsung
   8. Engineer approved equal.

B. Summary: Cooling only split-system air conditioning consisting of separate evaporator-fan and compressor-condenser components. Units shall be a variable capacity, single zone system.

C. Indoor Units: Self contained fully factory assembled, wired and run tested prior to shipment. Contained within the indoor unit shall be all factory wiring, piping, control circuit board, fan, and fan motor. The unit shall have a self-diagnostic function, 3-minute restart time delay mechanism, an auto restart function, an emergency / test operation. Indoor unit shall be charged with dry air before shipment from factory.
   1. Cabinet:
      a. Wall Mount
         1) The cabinet shall be of rigid polymer construction.
         2) The cabinet shall have a white finish.
         3) The cabinet shall be capable of adjustable air discharge.
         4) The cabinet shall come with an integral mounting bracket.
   2. Fan:
      a. The indoor unit fan shall be an assembly with a direct driven fan powered by a single motor.
      b. The fan shall be statically and dynamically balanced with permanently lubricated bearings.
      c. The indoor fan shall have no less than three fan speeds.
   3. Filter:
      a. Return air shall be filtered by means of an easily removed, washable, mold resistant filter.
   4. Coil:
      a. The indoor unit coil shall be of nonferrous construction with smooth plate fins on copper tubing.
      b. All tube joints shall have corrosion resistant alloy brazing.
      c. The coils shall be pressure tested at the factory.
      d. A sloped, corrosion resistant condensate pan with drain shall be provided under the coil.
      e. Provide a condensate pump with 20” of lift for discharge of condensate from drain pan.

f. The condensate pump shall be mounted within the indoor unit casing.

5. Electrical:
   a. The indoor unit shall be powered and controlled directly from the outdoor unit providing both primary power and integrated, by-directional, digital control signal.
   b. Indoor unit shall have a wall mounted and hard wired thermostat as shown on the drawings.

D. Outdoor Units:
1. General: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, with compressor and condenser.
2. Unit Cabinet:
   a. The casing shall be fabricated of galvanized steel with powder coating for corrosion protection. Assembly hardware shall be cadmium plated or stainless steel.
   b. Mounting feet, traverse mounted across the cabinet base pan, welded mount.
3. Fan:
   a. The unit shall be furnished with a direct drive, propeller type fan.
   b. The condenser fan motor shall be a variable speed, direct current (DC) motor and shall have permanently lubricated bearings.
   c. The fan motor shall be mounted with vibration isolation for quiet operation.
   d. The fan shall be provided with a guard to prevent contact with moving parts.
4. Coil:
   a. The outdoor unit coil shall be cooper with aluminum fins.
   b. The coil shall be protected with an integral guard.
   c. Refrigerant flow from the outdoor unit to the indoor units shall be independently controlled by means of an electronic linear expansion valve.
   d. Outdoor unit shall be pre-charged with sufficient refrigerant to run the system.
   e. All refrigerant piping between the outdoor and indoor units shall be sized per the manufacturer’s recommendations.
5. Compressor:
   a. The compressor shall be a high performance, hermetic, inverter driven, variable speed, dual rotary type.
   b. The compressor motor shall be direct current (DC) type equipped with a factory supplied and installed inverter drive package.
   c. The outdoor unit shall be equipped with a suction side refrigerant accumulator.
   d. The compressor will be equipped with an internal thermal overload.
   e. The compressor shall be mounted to avoid the transmission of vibration.
   f. The compressor shall have a low ambient kit and wind baffle to allow cooling down to 0 deg F.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install equipment exposed to finished areas after walls and ceilings are finished and painted. Avoid damage.

C. Protection: Provide finished cabinet units with protective covers during balance of construction.

D. Install refrigeration systems in accordance with ASHRAE 15.

E. Mount air-cooled outdoor condensing unit on rooftop supports or ground mounted stand. Refer to manufacturer’s instructions for minimum height. See drawings on location.

F. Install wind baffle in accordance with manufacturer recommendations.

G. Mechanical contractor shall run control wiring form outdoor unit to each indoor unit. Install wired thermostat as shown on the drawings.

3.02 CLEANING

A. After construction is completed, including painting, clean exposed surfaces of all units. Vacuum clean the coils and inside of the cabinets.

B. Touch-up marred or scratched surfaces of factory-finished cabinets using finish materials furnished by the manufacturer.

C. Install new filters.

END OF SECTION

SECTION 26 00 50
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Electrical Requirements specifically applicable to Electrical Division Specification Sections.

B. Division 26 Specification requirements also include, by reference, all Division 00 and 01 specification sections. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

C. Division 26 Specification requirements also include, by reference, Specification Section 08 7100 - Door Hardware. Review and inclusion of the electrical requirements of this specification section are included as a part of this contract.

1.02 OWNER OCCUPANCY

A. The owner will not occupy the premises during the construction period.

B. Limit use of site and premises to allow owner occupancy.

C. Cooperate with the owner to minimize conflict and to facilitate owner's operations.

D. Schedule the work to accommodate this requirement.

1.03 REGULATORY REQUIREMENTS

A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.

B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by themselves, by their employees or through any operation under their charge, whether in the contract or extra work.

C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.

D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve the contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.

E. All work shall comply with the applicable recommendations of:
   1. The National Board of Fire Underwriters
   2. The ANSI-NFPA 70 National Electrical Code (2023)
   3. The National Fire Protection Association (NFPA)
   4. The Occupations Safety and Health Act (OSHA)
   5. IBC Building Code (current) and any current applicable city building and or electrical codes.
   6. Fire Protection: Conform to International Fire Code (IFC) and NFPA.
   7. International Energy Conservation Code (IECC)

F. Obtain permits and request inspections from authority having jurisdiction.

G. Conform to latest approved versions of codes.

H. ICC 500 Rated Storm Shelter
   1. The contractor shall comply with all installation requirements as dictated in applicable in the current ICC 500 ICC/NSSA Standard for the Design and Construction of Storm Shelters.
   2. Refer to drawings for ICC 500 footprint extents and additional requirements.

3. ALL CONDUIT GREATER THAN 2" IN DIAMETER PENETRATING THE STORM SHELTER STRUCTURE SHALL USE STEEL ELBOWS. COORDINATE ALL PENETRATIONS WITH DESIGN TEAM DURING SHOP DRAWING PHASE.
4. Numerous penetrations may occur within a single shroud. Coordinate with other trades for bunched penetrations.

1.04 PROJECT/SITE CONDITIONS

A. Install work in locations shown on drawings unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer before proceeding.

C. This contractor, before submitting their bid, shall visit the site of the project to familiarize themselves with locations and conditions affecting their work.

D. It is the intent of this specification that the contractor furnish all labor and material required to complete the installation as outlined in the drawings and specifications. No additions to the contract price will be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing wiring conduits, electrical panels, equipment, services and grades be noted on the job site before bid is submitted and that all elevations and grades be verified before roughing in new work.

F. This contractor shall provide, as necessary, for the installation of their work and in accordance with materials other than the structure.

1.05 SEQUENCING AND SCHEDULING

A. This contractor shall arrange their work in order that it progresses along with the general construction of the building.

B. This contractor shall be kept informed as to the work of other trades engaged in the project and shall execute their work in such a manner so as not to delay or interfere with progress of other contractors.

C. Where space for mechanical and electrical lines and piping is limited, it is imperative that all such trades coordinate their work so as to ensure concealment in space provided. Where conflict exists, the engineer shall decide priority of space. If work is not properly coordinated, the engineer may require removal and relocation of work without additional compensation.

1.06 GUARANTEE

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished, and labor installed under this contract for a period of one year after date of final acceptance, unless a longer period is specified.

B. Neither final certificate of payment nor any provisions in the contract documents nor partial or complete occupancy of premises by owner shall constitute an acceptance for work not done in accordance with contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

C. Should any defects arise as the result of defective workmanship or material within the guarantee period set forth, this contractor shall make the necessary correction at their own expense.

1.07 ENGINEER APPROVED EQUAL PRODUCTS

A. When the engineer, at the request of the interested parties, including the contractor, supplier and manufacturer approved "engineer approved equal" products for this project, such products are approved on the assumption that they will equal or exceed the performance of the products specified.

B. If such products do not do so after being installed on this project, this contractor shall replace or modify the particular product as necessary to equal the performance of the products specified at no expense to the owner, architect or engineer.

C. Request for "engineer approved equal" products shall be received by the architect/engineer prior to the last addendum being issued. Requests for substitutions received after this date will not be considered. Substitution requests shall clearly state which products are being considered for substitution. Substitution requests shall include all pertinent product information needed to evaluate the substitution as an "equal".

D. Similar products shall be all of the same manufacturers and style. There is no exception to this unless prior approval has been granted from engineer.

1.08 OWNER'S RIGHT OF SALVAGE

A. Before beginning construction, the contractor shall check and verify with the owner each item of existing equipment that must be removed.

B. The owner will designate which items of material or equipment not reused that they may wish to keep. The contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.

C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their use shall become the property of the contractor and shall be removed from the site.

1.09 PROTECTION AND MAINTENANCE

A. The work covered by these drawings and specifications may involve work in both new and remodeled areas of the building.

B. Where necessary to connect to any existing utility service, this electrical contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.

C. Any work to be done in existing structures shall be coordinated with the owner and arrangements made so that traffic flow may be maintained and areas finished where possible before other areas are begun.

D. This contractor shall protect existing equipment in finished areas from dirt, dust and damage as a result of their work.

E. Coordinate protection requirements with department heads before beginning construction.

F. Protect any building openings from unauthorized entry. Coordinate with owner where building entry must be controlled.

1.10 CUTTING AND PATCHING

A. This contractor shall do all cutting and patching necessary for the installation of his work in all existing and new buildings unless otherwise noted.

B. In areas where the integrity of new or existing fire separation assembly/wall is compromised by the work, this contractor shall be responsible to patch and/or seal openings as necessary to maintain and/or return fire separation to rating as required by applicable codes.

C. This contractor shall do all cutting and patching required for his work beyond the remodeled areas unless otherwise noted. All finish work shall include patching to match existing adjacent surfaces. Painting shall be by others.

1.11 DAILY HOUSEKEEPING AND CLEANING

A. At the end of each workday, the contractor shall remove all of their debris, rubbish, tools, and surplus materials from the project work area. The work area shall be broom cleaned and left in a neat and orderly condition. The contractor shall not use the owner’s waste disposal facility for the removal of debris from the project.

B. At end of construction, all equipment shall be cleaned and the premises left in first class condition as far as this contractor's work is concerned.

1.12 CLEANING AND RUBBISH

A. This contractor, upon completion of their work, shall remove all rubbish and debris resulting from their operation and shall remove it from site at their own expense.

B. As far as their work is concerned, all equipment shall be cleaned and the premises left in first class condition.

C. This contractor shall maintain the work area each day to prevent hazardous accumulation of waste from their work.

1.13 SEALING AND PENETRATION

A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.

B. This contractor shall verify rating and location of all such construction with the architectural drawings and seal all penetrations.

C. Manufacturer offering products to comply with the requirements include the following:
   1. Dow Corning "Silicone RTV Foam"
   2. 3-M Corporation "Fire Barrier Caulk and Putty"
   3. Thomas & Betts "Flame Safe Fire Stop System"

D. Installation of these products are to be in strict accordance with the manufacturer's recommendations.

E. This contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.14 ELECTRICAL CONNECTIONS

A. This contractor shall mount and wire all magnetic starters, thermal protective switches, and speed changing switches furnished under the mechanical contract and install such starters and switches and wire them to their respective motors as a part of the electrical contract.

B. All other magnetic starter switches, safety switches and speed control devices indicated on the electrical drawings or specifications are the responsibility of the electrical contractor to furnish and install.

C. Unless specifically stated elsewhere, the wiring of the temperature control system shall be the responsibility of the mechanical contractor.

D. This contractor shall provide line voltage power and rough-in for Fire Alarm system. Coordinate required line voltage and installation locations prior to bid.

1.15 HAZARDOUS MATERIALS

A. If this contractor stores any hazardous solvents or other materials on the site, they shall obtain copies of the safety data sheets for the materials and post them at the site. This contractor shall inform the owner and all employed of any potential exposure to this material.

B. At no time shall any product containing asbestos be incorporated into the work.
   1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.16 AS-BUILT DRAWINGS

A. This electrical contractor shall provide (at the conclusion of the project) one clean, non-torn, neat and legible "as-built" set of drawings to the owner. These drawings shall show the routing of conduit, wiring and equipment drawn in at scaled locations. All circuits shall be labeled and shall conform to labeled panel breakers. All dimensions indicated shall be referenced to a column line. A set of construction drawings will be furnished for this work.

B. All electrical panels and electrical installed equipment shall be shown on the "as-built" drawings.

C. Refer to General Specification Sections for additional requirements.

D. This contractor shall update these drawings during the project at least once a week.

1.17 ALTERNATES

A. Refer to description of alternate bids under General Specification Sections.

1.18 REVIEW OF MATERIALS

A. This contractor shall submit to the engineer for review one (1) electronic copy giving a complete list of materials, fixtures, devices and panels they propose to furnish. The brochure shall contain complete information as to the make of equipment, type, size, capacities, dimensions, and illustration. One of the returned copies shall be kept on the job at all times.

B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless the contractor notifies engineer, in writing, of such deviation at time such drawings are furnished.

C. All submittals shall have the date marked on them when the contractor receives them from the supplier. Submittals shall be submitted through the contractor and shall not come direct from the supplier to the architect or engineer.

D. This contractor shall mark the date and sign each set. This indicates that each of them have been checked in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted or checked and will be marked "resubmit" and sent back to the contractor.

1.19 TEST OF SYSTEMS

A. This contractor shall, before concealed, test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.

B. This contractor shall be held responsible for all damage resulting from defects in the system.

C. Each individual feeder circuit shall be tested at the panel and in testing for insulation resistance to ground; the power equipment shall be connected for proper operation. In no case shall the insulation resistance to ground be less than that required by the National Electrical Code (NEC).

D. For 480V systems that are 1,000 amps or greater, this contractor shall provide primary injection testing to satisfy the requirements of the National Electrical Code (NEC) to ensure the ground-fault protection system has been performance tested when first installed on-site and provide a written record of this test to the Owner once completed.

1.20 SCOPE OF WORK

A. This contractor shall furnish all the labor and material necessary to install a complete electrical system for the building. The system shall include all items of work as outlined in these specifications and on the drawings.

B. All work shall be performed by a well-qualified, licensed electrician with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their employees are familiar with all the various codes and tests applicable to this work.

C. All equipment shall be new and of the type specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

D. The intent of the specifications and drawings is for complete installation of the systems outlined in the specifications and drawings so that at the conclusion of construction the system will be turned over to the owner complete and ready for safe and efficient operation. The

specifications and drawings cannot deal individually with the many minute items that may be eventually required by the nature of the systems.

E. This contractor is required to furnish and install all such items normally included on systems of this type, which, while not mentioned directly herein or on the drawings are obviously essential to the installation and operation of the system and which are normally furnished on quality installation of this type.

F. This contractor, before proceeding with any work, shall review the architectural drawings. Any conflict between the electrical and architectural drawings shall be reported to the engineer for clarification.

G. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer's attention and an addendum is issued for clarification.

H. The Electrical Contractor shall establish electrical utility elevations prior to fabrication and installation. The Electrical Contractor shall coordinate utility elevations with other trades. All elevations shall be coordinated with all trades in the field prior to installation. When a conflict between trades arises, the design team shall be notified immediately prior to further installation however priority shall be as follows:
   1. Lighting Fixtures
   2. Gravity flow piping, including steam and condensate.
   3. Sheet metal.
   4. Cable trays, including access space.
   5. Other piping.
   6. Conduits and wireway.

1.21 ELECTRICAL UTILITY COMPANY

A. Any fees by the utility company are to be billed directly to the owner.

B. The contractor is required to assist the owner in the preparation of all utility company rebate forms that deal with equipment furnished and/or installed as a part of this contractor.

1.22 TELECOMMUNICATIONS UTILITY COMPANY

A. Any fees by the telecommunications utility company are to be billed directly to the owner.

B. The contractor shall be required to provide pathways to the property easement and/or right-of-way. Final Coordination of conduit routing and termination shall be performed by this contractor while communicating with each telecommunications utility company. This shall include telephone, cable television and internet services to the building.

1.23 WALL CONTINUITY (1 HR.)

A. All items mounted in 1 hr. rated walls requiring an opening larger than a four inch (4") square (16 sq. inches) require the 1 hr. rating not be degraded.

B. Any branch panel in a 1 hr. wall will require the exterior of the recessed panel be covered with 5/8 inch fire rated gypsum board. This is true for any device requiring more than a 16 sq. inch opening.

1.24 TRENCHING AND BACKFILLING

A. Each contractor is responsible for their own individual trenching and backfilling unless otherwise noted in the drawings or addendum.

B. All underground utilities, telephone conduit, parking lot lighting, tunnels, etc shall be exactly located prior to digging. This contractor shall be held responsible for all damages caused by failure to do so.

C. Any backfill shall be tamped and compacted to prevent future settling. The backfill shall be installed to a smooth and level grade and installed in accordance with local codes.

D. All excess dirt shall be cleared from the area and disposed of as directed by the owner.

E. Refer to architectural specification sections for additional information.

1.25 LOW VOLTAGE CONDUIT INSTALLATION

A. This contractor shall install conduit serving low voltage cables located in all mechanical rooms and non-accessible areas and exposed structural areas. Use cable trays in other areas as indicated on the drawings. Where cable trays are not accessible, use J-hooks equal to Caddy Cable CAT. Provide hooks with closure holes and cable ties. Mount hooks three foot (3') on center.

B. This contractor shall install conduit sleeves serving low voltage cables through walls and floors.

C. Refer to other specification sections for additional information.

1.26 TEMPORARY POWER AND LIGHTING

A. Temporary electrical power and lighting necessary for the construction process is the responsibility of the electrical contractor and shall be included in the base bid amount.

1.27 EXTRA MATERIALS AND LABOR

A. The electrical contractor shall include in their bid additional resources for the removal and installation of 15 existing junction boxes in order to maintain access upon completion of construction. Provide new wiring as necessary where length is insufficient to maintain a complete system. The relocation requests may occur anytime during the construction process as requested by the Owner or Design Team. Junction boxes may be associated with Divisions 26, 27 and 28.

1.28 DIGITAL MEDIA AGREEMENT

A. Computer Aided Drafting (CAD) documents may be available to the contractor for some uses. Contact the engineer prior to bidding to determine what information is available to be transmitted to the contractor in digital form.

B. When documents are determined to be available, and as requested by the contractor, they will be transmitted upon the completion and execution of the MODUS digital media agreement. A service fee for each document transmitted will be assessed to the contractor. Documents will be transmitted upon payment receipt. Current service fee is $100.00 per CAD sheet.

1.29 SECURE NETWORKABLE DEVICES

A. Update network devices to the most current software/firmware.

B. Change default password of all networkable devices.
   1. Passwords shall have at least eight characters.
   2. Include uppercase and lowercase letters, numerals, and special characters

C. Supply MAC address and serial number of all networkable devices.

D. Work with the Owner’s IT department to align to existing IT standards.

E. Provide to the owner a printed and/or electronic spreadsheet log of all network information including, IP addresses, MAC addresses, logins and password information during system training.

1.30 SYSTEM CONFIGURATION AND PROGRAMMING FILES

A. Supply system configuration and programming files where export is available.

B. Supply uncompiled programming for systems applicable.

C. All configuration and programming shall be property of the owner at conclusion of the project.

1.31 COMMISSIONING REQUIREMENTS

A. Vendors / Subcontractors

1. Provide all requested submittal data, including detailed startup procedures and specific responsibilities of the owner to keep warranties in force.
2. Assist in equipment testing per agreements with subcontractors and/or contractor.
3. Include cost of all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing, operating, and maintaining equipment according to these contract documents in the base bid price to the contractor.
4. Analyze specified products and verify that the A/E has specified the newest, most current equipment reasonable for this project's scope and budget.
5. Provide requested information regarding equipment sequence of operation and testing procedures.
6. Review construction checklists and test procedures for equipment installed by factory representatives.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 26 00 51
PRE-BID SUBSTITUTION REQUEST FORM

This document shall be submitted for all MODUS projects where a manufacturer's sales rep requests that additional products be considered where they are not currently listed on the lighting fixture schedule and/or specifications. Where "Engineer Approved Equal" is listed on the fixture schedule, the designer for the project was unable to find a product that matched the performance and/ or aesthetic criteria required. Product submittals shall include notations on any variances so that they are brought to the attention of the designer for consideration.

All substitution requests shall be submitted to the electrical engineer (10) ten business days prior to the project bid date. The electrical engineer contact information can be found on the first page of the MEP cover sheet. If information is not available, please contact MODUS directly at (515) 251-7280 to identify the responsible party.

Refer to the paragraphs below for product submittal requirements. However, only page 2 is to be completed and submitted with the required information.

LIGHTING FIXTURE SUBSTITUTION REQUEST FOR CONSIDERATION:

1. Provide a summary, description, and any discrepancies of the lighting fixture(s) being submitted for consideration. - i.e. "submitting alternate fixtures for cove products", "submitting alternate LED troffer", etc.
2. Summarize any differences that you are aware of for each product: "has 3.5" aperture while 3" was specified", "fixture has slightly lower lumen package but better efficacy", "steel pole instead of aluminum", etc.
3. Provide a list of lighting fixtures being submitted on your company letterhead along with this form at the beginning of the submittal. The list shall include the TYPE, MANUFACTURER and MODEL NUMBER that is being submitted.
4. Submitter shall include a product page for each type(s) being submitted. The product page shall have all parts of the model number identified by highlighting or boxing in the specific components. If these items are not identified, we will not review the submittal request.
5. Submit IES files for all products submitted, re-named with the fixture type being submitted. Photopia or other software created files will not be accepted. ie: TYPE FA.ies

LIGHTING CONTROLS SUBSTITUTION REQUEST FOR CONSIDERATION:

1. Provide a summary, description, and any discrepancies of the lighting control devices being submitted for consideration. ie - "submitting alternate control devices".
2. Please provide and review the sequence of operation located on our lighting drawings that outline the required control methods for each space. It is our expectation that the submitter completely understands the manufacturer's responsibility to make sure all parts and pieces are included is your submittal.
3. Provide manufacturer warranty and commissioning information.
4. Submitter shall include a product page for each type(s) being submitted. The product page shall have all parts of the model number identified by highlighting or boxing in the specific components.

SUMMARY OF OTHER LIGHTING RELATED ITEMS BEING SUBMITTED:

1. This section is for battery packs, inverters or any other items that you would like us to consider where you believe that you have an equivalent product for us to consider. Again, please don't just include "generic" cutsheets – identify exactly what products you are submitting and if there are any differences that we should be aware of.

PROJECT NAME: _____

PROJECT LOCATION: _____

DATE SUBMITTED: _____

BID DATE: _____

ELECTRICAL ENGINEER: _____

FIXTURE SCHEDULE SHEET: _____

LIGHTING FIXTURE SUBSTITUTION REQUEST FOR CONSIDERATION:

Note that if a fixture is approved in our addendum, light fixtures will be approved only with the TYPE and MANUFACTURER listed. It shall be the responsibility of the submitter to verify that all information contained within the submittals after bids are awarded matches the dimensions, lumen outputs, voltages, dimming types, warranties, etc.

LIGHTING CONTROLS SUBSTITUTION REQUEST FOR CONSIDERATION:

SUMMARY OF OTHER LIGHTING RELATED ITEMS BEING SUBMITTED:

END OF SECTION

SECTION 26 00 90
MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements of the Contract Forms, the Conditions of the Contract, Division 1 - General Requirements and Specification Section 26 00 50 - Basic Electrical Requirements "General Provisions" apply to this section.

1.02 SCOPE

A. This contractor shall be responsible for the demolition and removal of all existing electrical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.

B. Preserve services to the existing facility. Extend, reroute, and reconnect existing systems as required providing for the continued function of these systems.

C. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

D. This electrical contractor shall remove all abandoned equipment, conduit, supports, equipment curbs and bases associated with the remodeled area unless noted otherwise.

E. This contractor is responsible to provide temporary electrical protection during this project.

1.03 MATERIALS

A. All elements to be removed are subject to the Owner's Right of Salvage.

B. All materials removed shall be the property of the removing contractor and shall be removed from the site by them, unless otherwise specified.

C. The owner may designate and have salvage rights to any material herein demolished by this contractor. It will be the owner's responsibility to designate such salvageable items and remove them prior to the contractor working in that area.

1.04 WORK BY OTHERS

A. Unless specifically noted under other contracts, the electrical contractor shall assume they will perform all required work. In general, the following will be performed by others:
   1. The mechanical contractor shall be responsible for the cutting and capping of all existing gas, water, sewer, and any other utility service.

1.05 EXISTING CONDITIONS

A. If any existing fixtures or devices that are to remain are disturbed by operations under this contract, this contractor is required to re-establish continuity of such systems.

B. This electrical contractor shall arrange for the general contractor to repair and patch all construction with material necessary to match surrounding due to removal of equipment and conduit.

C. This electrical contractor shall furnish all required labor and material, where required, to extend new work to connect to similar work for extension of existing systems.

D. Demolition plans are based on casual field observations and existing record documents. Report discrepancies to the owner before disturbing existing installation. Beginning of demolition means installer accepts existing conditions.

E. Floor slabs contain conduit systems. Contractor is responsible for taking any measures required to ensure no conduits are damaged.

F. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify field-circuiting arrangements and reconnect as necessary.

B. Verify that abandoned wiring and equipment serve only abandoned facilities. Reconnect circuits, as required, to prevent de-energizing of remaining receptacles and lights.

C. Demolition drawings are based on casual field observation and existing record documents. Report discrepancies to the owner before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

E. Review existing panels to remain in the area of construction. Notify the design team of any damaged circuit breakers or missing closure plates.

F. Review existing lighting to remain in the area of construction. Notify the design team of any non-functional lamps, ballasts, or electrical parts.

3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal. Disconnect circuits at the source.

B. Coordinate utility service outage with local utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits use personnel experienced in such operations. This shall include 600 volt or less systems and low voltage signal circuits.

D. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switch over and connections. Notify owner and local fire service at least 24 hours before partially or completely disabling the system. Minimize outage duration. Make temporary connections to maintain service within construction areas and in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of this section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors and patch surfaces.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide a blank cover for abandoned outlets that have not been removed.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization removed equipment.

H. Disconnect and remove abandoned luminaires, brackets, stems, hangers, and other accessories. This contractor shall include in their bid, associated fees for disposal of ballasts and lamps.

I. Repair adjacent construction and finishes damaged during demolition and extension work.

J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

K. Extend existing installation using materials and methods compatible with existing electrical installations or as specified.

L. This electrical contractor is responsible for removal of lamps and ballast from existing fixtures to be demolished. The electrical contractor is to properly dispose of these items in accordance with codes for hazardous materials.

3.04 CLEANING AND REPAIR

A. Clean and repair existing materials that remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Provide typed circuit directory showing revised circuiting arrangement.

3.05 INSTALLATION

A. Install relocated materials and equipment.

END OF SECTION

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SECTION 26 05 19
ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building wire

B. Wiring connectors

1.02 RELATED SECTIONS

A. Specification Section 26 0553 - Identification for Electrical Systems

B. Specification Section 26 2413 - Distribution Switchgear

C. Specification Section 26 2416 - Panelboards

D. Specification Section 28 3100 - Fire Detection and Alarm

1.03 REFERENCES

A. NECA Standard of Installation (National Electrical Contractors Association)

B. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association)

C. NFPA 70 - National Electrical Code

D. Product Data: Provide for each cable assembly type.

E. Test Reports: Indicate procedures and values obtained.

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.04 SUBMITTALS

A. Project Record Documents: Record actual locations of components and circuits.

B. Project Record Documents: Provide documentation of the manufacturer’s recommended lug torque value for aluminum conductors, the date the lugs were torqued, and installed torque readings.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.07 PROJECT CONDITIONS

A. Verify that field measurements are as indicated.

B. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 foot of length shown.

1.08 COORDINATION

A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

PART 2 PRODUCTS

2.01 BUILDING WIRE

A. Manufacturers:
   1. Okanite

2. Bell/Hubbell #BICC
3. American Insulated Wire
4. General Cable
5. Southwire
6. Encore Wire Corporation
7. Engineer approved equal.

B. Description: Insulated conductor wire.
1. All wire shall be stranded. Refer to Section 26 0553 Identification for Electrical Systems for conductor color requirements.
2. Wire sizes #12 AWG and smaller shall be solid. Wire sizes #10 AWG and larger shall be stranded.
a. Insulation colors for 277/480V shall be as follows: phase A shall be brown, phase B shall be orange, and phase C shall be yellow.
b. Insulation colors for 120/208V shall be as follows: phase A shall be black, phase B shall be red, and phase C shall be blue.
c. For conductors that are too large to be provided in the required color install wire markers per the requirements of Section 26 0553 Identification for Electrical Systems.
3. Provide solid wire pigtails at all wiring devices and lighting control devices.

C. Conductor:
1. Copper
2. Feeders, where sizing is indicated at the Electrical Riser Diagram, may use compact aluminum equal to Southwire #AlumaFlex® Aluminum (AA-8176) Conductor.

D. Insulation Voltage Rating: 600 volts.

E. Insulation: NFPA 70, type #THHN/THWN-2. All cable installation procedures or sizing shall be based on 75 deg C temperature rating.

2.02 WIRING CONNECTORS

A. Split Bolt Connectors:
1. Burndy
2. Engineer approved equal.

B. Spring Wire Connectors:
1. Thomas & Betts
2. Engineer approved equal.

C. Compression Connectors:
1. Burndy
2. Thomas & Betts
3. Engineer approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

C. Verify that raceway installation is complete and supported.

3.02 PREPARATION

A. Completely and thoroughly swab raceway over two inch (2") in size or buried below grade before installing wire.

3.03 WIRING METHODS

A. Concealed Dry Interior Locations: Use only building wire, type #THHN/THWN-2 insulation in raceway.

B. Exposed Dry Interior Locations: Use only building wire, type #THHN/THWN-2 insulation in raceway.

C. Above Accessible Ceilings: Use only building wire, type #THHN/THWN-2 insulation in raceway.

D. Wet or Damp Interior Locations: Use only building wire, type #THHN/THWN-2 insulation in raceway.

E. Exterior Locations: Use only building wire, type #THHN/THWN-2 insulation, in raceway. Use liquid-tight wiring methods. Use liquid-tight connections.

F. Underground Installations: Use only building wire, type #THHN/THWN-2 insulation, in raceway. Use liquid-tight wiring methods.

G. Interior Installations: Use only building wire, type #THHN/THWN-2 insulation, in raceway.

H. Use wiring methods indicated.

3.04 INSTALLATION

A. Route wire and cable as required meeting project conditions.

B. Install cable in accordance with the NECA "Standard of Installation."

C. Control wiring shall be no smaller than #14 AWG.

D. Use conductors not smaller than 12 AWG for power and lighting circuits. Only pre-manufactured fixture whips are allowed to be 14 AWG.

E. Use #10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.

F. Use #10 AWG conductors for 20 ampere, 208/240 volt branch circuits longer than 200 feet.

G. Use #10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 300 feet.

H. Provide minimum #8 AWG wiring for exterior lighting and power circuits leaving building.

I. It shall be the responsibility of the electrical contractor to verify all voltage drop and size all wire accordingly.

J. Pull all conductors into raceway at same time.

K. Use suitable wire pulling lubricant for building wire #4 AWG and larger.

L. Protect exposed cable from damage.

M. Use suitable cable fittings and connectors.

N. Neatly train and lace wiring inside boxes, equipment and panel boards.

O. Clean conductor surfaces before installing lugs and connectors.

P. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

Q. Use split bolt connectors for copper conductor splices and taps, #6 AWG and larger. Tape non-insulated conductors and connector with electrical tape to 150% of insulation rating of conductor.

R. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, #8 AWG and smaller.

S. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, #10 AWG and smaller. All connections in exterior hand holes shall have liquidtight connections.

T. Identify and color code wire and cable under provisions of Specification Section 26 0553 - Identification for Electrical Systems. Identify each conductor with its circuit number or other designation indicated.

U. Do not install multi-wire branch circuits. No sharing of neutral shall be permitted.

V. Branch circuit conduit fill shall be limited to 3 grounded, 3 ungrounded and one equipment grounding conductor.

W. Install all conductors and make final connections in accordance with all manufacturer’s recommendations.

X. Circuits indicated as 3-pole and having ECM motor loads shall include a neutral conductor.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection and testing.

B. Inspect wire and cable for physical damage and proper connection.

C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

D. Verify continuity of each branch circuit conductor.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rod electrode and conductors

B. Mechanical connectors

C. Wire

1.02 RELATED SECTIONS

A. Specification Section 27 0526 - Grounding and Bonding for Communication Systems

1.03 SUBMITTALS

A. Product data and manufacturer's installation instructions for non-approved manufacturers shall be submitted for review prior to the bid date.

B. Submittals shall include:
   1. Dimensional drawing for each planned device.
   2. Exothermic Connection Certification for installers.

1.04 SUMMARY

A. Provide all labor, materials, and equipment necessary to properly install a grounding system conductor in all new branch wiring and feeder installations, which shall be in full compliance with all applicable codes as accepted by the authorities having jurisdiction. The secondary distribution system shall include a grounding conductor in all raceways in addition to the return path of the metallic conduit.

B. In general, all electrical equipment (metallic conduit, motor frames, panelboards, etc.) shall be bonded together with a green insulated or bare copper system grounding conductor in accordance with specific rules of Article 250 of the NEC and local codes. The bonding conductor through the raceway system shall be continuous from main switch ground bus to panel ground bar of each panelboard, and from panel grounding bar of each panelboard to branch circuit equipment and devices.

C. All raceways shall have an insulated copper system ground conductor throughout the entire length of circuit installed within conduit in strict accordance with NEC. The grounding conductor shall be included in total conduit fill determining conduit sizes, even though not included or shown on drawings. All grounding conductors that run with feeders in PVC conduit outside of building shall be bare only.

D. Provide and install all grounding and bonding as required by the National Electrical Code (NEC) including but not limited to Article 800 of the NEC.

1.05 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code

B. IEEE 837-2014: Standard for Qualifying Permanent Connections Used in Substation Grounding

C. IEEE Emerald Book

D. IEEE Green Book

1.06 PROJECT RECORD DOCUMENTS

A. Submit record documents to accurately record actual locations of grounding electrodes.

B. Submit test results of each ground rod.

1.07 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 ROD ELECTRODE AND CONDUCTORS

A. Material: Copper-clad steel.

B. Diameter: 5/8 inch.

C. Length: 10 feet (min). Increase number and/or lengths of ground rod electrodes as required to meet and achieve specified resistance.

D. Maintain separation of not less than eight foot (8') and not more than 20 feet between ground rod electrodes.

2.02 MECHANICAL CONNECTORS

A. All grounding connectors shall be in accordance with UL 467 and UL listed for use with rods, conductors, reinforcing bars, etc., as appropriate.

B. Connectors and devices used in the grounding systems shall be fabricated of copper or bronze materials, and properly applied for their intended use. All connectors and devices shall be compatible with the surfaces being bonded and shall not cause galvanic corrosion by dissimilar metals.

C. Lugs: Substantial construction, of cast copper or bronze with "ground" (micro-flat) surfaces, twin clamp, and two-hole tongue equal to Burndy QQA Series.

D. Grounding and Bonding Bushings: Malleable iron.
   1. Manufacturers:
      a. Thomas & Betts
      b. Engineer approved equal.

E. Piping Clamps: Burndy GAR-TC Series with a two-hole compression terminal.

F. Grounding Screw and Pigtail: Raco #983.

G. Building Structural Steel: Thompson #701 Series heavy duty bronze "C" clamp with two-bolt vise-grip cable clamp or equal.

H. Mechanical lugs or wire terminals shall be used to bond ground wires together or to junction boxes and panel cabinets.

2.03 WIRE

A. Material: Stranded copper.

B. Size to meet NFPA 70 requirements as a minimum. Increase size if called for on drawings or in these specifications.

C. Insulated THWN (or bare as noted elsewhere).

PART 3 EXECUTION

3.01 GENERAL

A. Install products in accordance with manufacturer's instructions.

B. Install grounding electrodes conductor, bonding conductors, ground rods, etc. with all required accessories.

C. Grounding shall meet (or exceed as required to meet these specifications) all the requirements of the N.E.C., the NFPA, and applicable standards of IEEE.

D. Where there is a conflict between these specifications and the above applicable codes/standards or between this section of these specifications and other sections, then the most stringent or excessive requirement shall govern. Where there is an omission of a code/standard requirement in these specifications then the current code/standard requirements shall comply.

E. Requirement in these specifications to comply with a specific code/standard article, etc. is not to be construed as deleting of requirements of other applicable codes/standards and their articles, etc.

3.02 GROUNDING ELECTRODES

A. All connections shall be exothermic welded unless otherwise noted herein. All connections above grade and in accessible locations may be by exothermic clamping with devices UL listed as suitable for use except in locations where exothermic welding is specifically specified in these specifications or called for on drawings.

B. Each rod shall be die stamped with identification of manufacturer and rod length.

C. Install rod electrodes at locations indicated and/or as called for in these specifications.

D. Ground Resistance:
   1. Main Electrical Service (to each building) and Generator Locations:
      a. Grounding resistance measured at each main service electrode system and at each generator electrode system shall not exceed 5 ohms.
      b. Other Locations:
         1) Resistance to ground of all non-current carrying metal parts shall not exceed 5 ohms measured at motors, panels, busses, cabinets, equipment racks, light poles, transformers, and other equipment.
         2) Resistance called for above shall be maximum resistance of each ground electrode prior to connection to grounding electrode conductor. Where ground electrode system being measured consists of two or more ground rod electrodes then the resistance specified above shall be the maximum resistance with two or more rods connected together but not connected to the grounding electrode conductor.

E. Install additional rod electrodes as required to achieve specified resistance to ground (specified ground resistance is for each ground rod location prior to connection to ground electrode conductor).
   1. Provide grounding well with cover at each rod location. Install grounding well top flush with finished grade.
   2. Verify that final backfill and compaction has been completed before driving rod electrodes.
   3. Install ground rods not less than one foot (1') below grade level and not less than two feet (2') from structure foundation.

3.03 GROUNDING ELECTRODE CONDUCTOR

A. Conductor shall be sized to meet or exceed the requirements of NEC 250 to meet these specifications and/or drawings.

3.04 GROUNDING CONDUCTORS

A. Grounding conductors shall be provided with every circuit to meet (or exceed as required to meet these specifications and/or drawings) the requirements of NEC 250.

B. At every voltage level, new portions of the electrical power distribution system shall be grounded with a dedicated copper conductor, which extends from termination back to power source in supply panelboard.

C. Provide separate, insulated (bare if with feeder in PVC conduit outside of building) conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug.

D. Except as otherwise indicated, each feeder raceway on the load side of the service entrance shall contain a ground conductor sized as indicated and where not shown shall be sized to meet (or exceed as required) these specifications and/or drawings the requirements of NEC 250. The conductor shall be connected to the equipment grounding bus in switchboards and panelboards, to the grounding bus in all motor control centers, and as specified to lighting fixtures, motors, and other types of equipment and outlets. The ground shall be in addition to

the metallic raceway and shall be properly connected thereto, using a lug device located within each item enclosure at the point of electric power connections to permit convenient inspection.

E. Provide green insulated ground wire for all receptacles and for equipment of all voltages. In addition to grounding strap connection to metallic outlet boxes, a supplemental grounding wire and screw equal to Raco No. 983 shall be provided to connect receptacle ground terminal to the box.

F. All plug strips and metallic surface raceway shall contain a green insulation ground conductor from supply panel ground bus connected to grounding screw on each receptacle in strip and to strip channel. Conductor shall be continuous.

G. All motors, all heating coil assemblies, and all building equipment requiring flexible connections shall have a green grounding conductor properly connected to the frames and extending continuously inside conduit with circuit conductors to the supply source bus with accepted connectors regardless of conduit size or type. This shall include food service equipment, laundry equipment, and all other "Equipment By Owner" to which an electric conduit is provided under this Division.

3.05 MAIN ELECTRICAL SERVICE

A. Existing Buildings:
   1. This electrical contractor shall verify that the building's electrical service is properly grounded as required by the NEC.
   2. Provide and install electrical service grounding at the building as called for herein for all existing services that do not comply with the grounding specified above.
   3. Supplement existing electrical service grounding at each building as required to comply with all requirements in these specifications.
   4. If exterior ground rod electrode does not exist at the buildings main electrical service, provide and install these ground rods as called for main electrical service, exterior of building.

B. Complete installation shall meet and exceed the requirements of the NEC 250.

C. Artificial electrodes shall be provided for the main service in sufficient number and configuration to secure resistance specified.

D. Bond To All Of The Following When Available On Site:
   1. Ground Rods.
   2. Metal Water Pipe (Interior and Exterior to Building)
   3. Building Metal Frame, Structural Steel and/or Reinforced Structural Concrete
   4. All Piping Entering or Leaving All Buildings.
   5. Provide a main ground, bare copper conductor, sized per applicable table in NEC 250, but in no case less than #2/0, shall be run in conduit from the main switchgear of each building to the building steel in each respective building. Reference NEC 250.104 (c). This ground conductor shall also be run individually from the main switchgear and be bonded to the main water service ahead of any union in pipe and must be metal pipe of length as acceptable by authorities having jurisdiction. Provide properly sized bonding shunt around water meter and/or dielectric unions in the water pipe.

E. Ground/bond neutral per NEC 250.

F. Provide and install ground bus bar on wall near main service disconnect/switchboard. Connect to ground bar in disconnect/switchboard bonded to switchboard/disconnect enclosure/neutral with copper grounding conductor sized per applicable table in NEC 250.

3.06 TRANSFORMER GROUNDING

A. Ground all transformers and enclosures of 120/208V and 277/480V "separately derived systems" as specified herein.
   1. Ground per NEC 250 and these specifications.

2. Bond neutral to transformer frame/enclosure and the equipment grounding conductors of the derived system with copper ground conductor sized per applicable table in NEC 250.
3. Connect transformer neutral/ground to grounding electrode per NEC 250 with grounding electrode conductor sized per applicable table in NEC 250.
4. Where neither building steel nor water pipe grounding electrodes are available (i.e. exterior locations with no available water pipe electrode) provide two ground connections: each to two or more ten foot (10') ground rod electrodes at no less than 30 foot spacing, driven vertical to a minimum depth of ten foot plus one foot below grade.
5. Connect all transformers to main electrical service ground bar with a grounding electrode conductor per NEC 250.
6. Ground to water system service pipe as required by NEC 250.

B. Provide additional ground electrodes as required to achieve specified ground resistance.

C. Where two or more ground electrodes are used at any one required ground location, they shall be bonded together with a copper ground conductor, sized to meet applicable table in NEC 250, but in no case less than #2/0.

D. Complete installation shall exceed the minimum requirements of NEC 250.

E. Equipment ground conductors shall be provided in addition to above grounding. See 'EQUIPMENT GROUNDING CONDUCTOR'.

3.07 GENERATOR GROUNDING

A. Separately derived systems (i.e. systems where generator neutral is not solidly interconnected to service supplied system neutral such as 4-pole switched neutral transfer switch systems).
1. Ground per NEC 250 and these specifications.
2. Bond neutral to transformer frame/enclosure and the equipment grounding conductors of the derived system with copper ground conductor sized per applicable table in NEC 250.
3. Connect generator neutral/ground to grounding electrodes per NEC 250 with grounding electrode conductor sized per applicable table in NEC 250.
4. Where neither building steel nor water pipe grounding electrodes are available (i.e. exterior locations with no available water pipe electrode) provide two ground connections: each to two or more ten foot (10') ground rod electrodes at no less than 30 foot spacing, driven vertical to a minimum depth of ten foot plus one foot below grade.

B. Provide additional ground electrodes as required to achieve specified ground resistance.

C. Where two or more ground electrodes are used at any one required ground location, they shall be bonded together with a copper ground conductor, sized to meet applicable table in NEC 250, but in no case less than #2/0.

D. Complete installation shall exceed the minimum requirements of NEC 250.

E. Equipment ground conductors shall be provided in addition to above grounding. See 'EQUIPMENT GROUNDING CONDUCTOR'.

3.08 LIGHT FIXTURES

A. All new and removed/reinstalled fixtures in building interior, and exterior fixtures shall be provided with green grounding conductor, solidly connected to unit. Individual fixture grounds shall be with lug to fixture body, generally located at point of electrical connection to the fixture unit.

B. All suspended fixtures and those supplied through flexible metallic conduit shall have green ground conductor from outlet box to fixture. Cord connected fixtures shall contain a separate green ground conductor.

3.09 MISCELLANEOUS GROUNDING CONNECTIONS

A. Provide bonding to meet regulatory requirements.

B. Required connections to building steel shall be with UL accepted non-reversible crimp type ground lugs exothermically welded to bus bar that is either exothermically welded or bolted to

steel in locations where weld will affect the structural properties of the steel. Required connections to existing building structural steel purlins/i beams shall be with heavy duty bronze "C" clamp with two bolt vise-grip cable clamp.

C. Grounding conductors shall be so installed as to permit shortest and most direct path from equipment to ground; be installed in conduit; be bonded to conduit at both ends when conduit is metal; have connections accessible for inspection; and made with accepted solderless connectors brazed or bolted to the equipment or to be grounded; in NO case be a current carrying conductor; have a green jacket unless it is bare copper; be run in conduit with power and branch circuit conductors. The main grounding electrode conductor shall be exothermically welded to ground rods, water pipe, and building steel.

D. All surfaces to which grounding connections are made shall be thoroughly cleaned to maximum conductive condition immediately before connections are made thereto. Metal rust proofing shall be removed at grounding contact surfaces, for 0 ohms by digital Vm. Exposed bare metal at the termination point shall be painted.

E. All ground connections that are buried or in otherwise inaccessible locations, shall be welded exothermically. The weld shall provide a connection which shall not corrode or loosen and which shall be equal or larger in size than the conductors joined together. The connection shall have the same current carrying capacity as the largest conductor.

F. Install ground bushings on all metal conduits entering enclosures where the continuity of grounding is broken between the conduit and enclosure (i.e. metal conduit stub-up into a motor control center enclosure or at ground bus bar). Provide an appropriately sized bond jumper from the ground bushing to the respective equipment ground bus or ground bus bar.

G. Install ground bushings on all metal conduits where the continuity of grounding is broken between the conduit and the electrical distribution system (i.e. metal conduit stub-up from wall outlet box to ceiling space. Provide an appropriately sized bond jumper from the ground bushing to the respective equipment ground bus or ground bus bar.

H. Each feeder metallic conduit shall be bonded at all discontinuities, including at switchboards and all sub distribution and branch circuit panels with conductors in accordance with applicable table in NEC 250 for parallel return with respective interior grounding conductor.

I. Grounding provisions shall include double locknuts on all heavy wall conduits.

J. Install grounding bus in all existing panelboards of remodeled areas, for connection of new grounding conductors, connected to an accepted ground point.

K. Where reinforced concrete is utilized for building grounding system, proper reinforced bonding shall be provided to secure low resistance to earth with "thermite" type devices, and #10AWG wire ties shall be provided to not less than ten full length rebars that contact the connected rebar.

3.10 GROUNDING BAR INSTALLATION

A. Where indicated on the drawings, provide and install grounding bar/ground bus (bus bar). These bus installations are intended to provide a low-impedance "Earthing" path for surge voltages, which are electrically "clamped" and shunted to earth by variable-impedance surge protective devices. Metal sheaths of underground cables are also to be grounded thereto at points of building entrance.

B. Mount bolt tapping lugs with hex head bolts to bus bar at two inch (2") on center spacing, one for each ground conductor.

C. Mount bus bar to wall using two inch (2") polyester molded insulator stand-off.

D. Extend a #2/0 (minimum size) or larger THWN insulated copper ground conductor (if larger size is called for on drawings or required by N.E.C. for service ground, etc.) in PVC conduit to accepted service ground installation or ground bus/bar in main service equipment enclosure.

E. Extend #6 insulated copper ground wire from respective bus/bar to each 'local' ground bus/bar in each cabinet for the data and sound systems (if applicable).

F. 'Systems' grounding bus/bar must be connected with #2/0 insulated copper conductor to grounding electrodes system as defined in NEC "Article 800-40(b).

G. A separate grounding bar shall be installed in telecommunication rooms. Connect to the main electrical grounding bar with a #4/0 AWG grounding conductor in conduit.

3.11 TESTING AND REPORTS

A. Raceway Continuity: Metallic raceway system as a component of the facilities ground system shall be tested for electrical continuity. Resistance to ground throughout the system shall not exceed specified limits.

B. Ground resistance measurements shall be made on each system utilized in the project. The ground resistance measurements shall include building structural steel, driven grounding system, water pipe grounding system and other accepted systems as may be applicable. Ground resistance measurements shall be made in normally dry weather, not less than 24 hours after rainfall, and with the ground under test isolated from other grounds and equipment. Resistances measured shall not exceed specified limits.

C. Upon completion of testing, the testing conditions and results shall be certified by the electrical contractor and submitted to the engineer.

3.12 INTERFACE WITH OTHER PRODUCTS

A. Interface with communications system installed under other specification sections.

3.13 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

B. Use suitable test instrument with current certificate of calibration to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method or signal injection method.

END OF SECTION

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SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Product requirements

B. Formed steel channel

C. Indoor housekeeping pads

D. Outdoor housekeeping pads

E. Sleeves

1.02 REFERENCES

A. NECA Standard of Installation (National Electrical Contractors Association)

B. NFPA 70 - National Electrical Code

1.03 SUBMITTALS

A. Product Data: Provide manufacturers catalog data for fastening systems.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of products.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS

A. Materials and Finishes:
   1. Corrosion resistant.
   2. Select materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit, including weight of wire in conduit.

B. Anchors and Fasteners:
   1. Concrete Structural Elements: Use expansion anchors and preset inserts.
   2. Steel Structural Elements: Use beam clamps and welded fasteners.
   3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
   4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
   5. Solid Masonry Walls: Use expansion anchors and preset inserts.
   6. Sheet Metal: Use sheet metal screws.
   7. Wood Elements: Use wood screws.

2.02 FORMED STEEL CHANNEL

A. Manufacturers:
   1. Globe Strut
   2. Uni-Strut
   3. Kindorf
   4. Power-Strut
   5. Erico
   6. Engineer approved equal.

B. Description: Galvanized steel.

2.03 INDOOR HOUSEKEEPING PADS

A. This contractor shall provide and install four inch (4") high concrete housekeeping pads under all floor-mounted equipment they have supplied and/or installed. The housekeeping pads shall extend a minimum of six inch (6") beyond the largest dimensions of the equipment mounted on the pad. The housekeeping pads shall have wire mesh embedded in the pad to reinforce the structure. All edges shall be rounded with a 1/2 inch radius.

2.04 OUTDOOR HOUSEKEEPING PADS

A. This contractor shall provide and install concrete pads under all electrical equipment installed outdoors. The pads shall be as detailed on the drawings unless indicated otherwise. This contractor shall install pads under all utility company supplied and installed transformers. The pad dimensions shall be detailed on the drawings unless indicated otherwise.

B. The pad dimensions and construction shall be in accordance to the utility company requirements.

C. For projects that include a generator, the generator pad shall be 4" nominal thick concrete for non walk-in type generators and 6" nominal thick concrete for walk-in type generators. The concrete pad shall extend 6" beyond the outside of the enclosure/fuel tank. All edges shall be rounded with a 1/2 inch radius. The contractor shall notify the design team if the manufacturer's installation instructions state otherwise.

2.05 SLEEVES

A. For conduits passing through wall, below grade, underground wall sleeves for conduits 4" or larger shall be continuous rigid steel. Seal with Linkseal, or engineer approved equal, at two diameters larger than conduit.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions and utility company regulations where applicable.

B. Provide anchors, fasteners and supports in accordance with NECA "Standard of Installation".
   1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
   2. Do not use spring steel clips and clamps.
   3. Do not use powder-actuated anchors.
   4. Do not drill or cut structural members.

C. Fabricate supports from structural steel or formed steel members or steel channel. Rigidly weld members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

D. Install surface-mounted cabinets and panelboards with minimum of four anchors.

E. Use steel channel supports to stand cabinets and panelboards one inch (1") off wall in all wet and damp locations.

F. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

G. Reinforce outdoor concrete pads with 1/2 inch steel reinforcing bars on 12 inch centers or as shown on the drawings.

H. All pathways and hangers shall be independently hung.

I. All pathways shall be routed overhead unless otherwise noted or approved by engineer.

END OF SECTION

SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Conduit requirements

B. Conduit types

C. Box types

1.02 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated

B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated

C. ANSI C80.5 - Rigid Aluminum Conduit

D. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies

E. ANSI/NFPA 70 - National Electrical Code

F. NEMA 250 - Enclosures for Electric Equipment

G. NEMA WD 6 - Wiring Device Configurations

H. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

I. NECA (National Electrical Contractor's Association) Standard of Installation

J. NEMA WD 6 - Wiring Device Configurations

K. TIA-569-B - Commercial Building Standard for Telecommunications Pathways and Spaces

1.03 RELATED SECTIONS

A. Specification Section 26 05 43 - Underfloor Ducts and Raceways for Electrical Systems

B. Specification Section 27 0526 - Grounding and Bonding for Communications Systems

1.04 PROJECT RECORD DOCUMENTS

A. Accurately record actual routing of conduits larger than two inches.

B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.06 SUBMITTALS

A. Product Data: Provide dimensions, knockout sizes and locations, materials, fabrication details, finishes, and accessories.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to the site.

B. Accept products on site. Inspect for damage.

C. Protect products from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.09 PROJECT CONDITIONS

A. Verify that field measurements are as shown on the drawings.

B. Verify routing and termination locations of conduit prior to rough in.

C. Conduit routing is shown on the drawings in approximate locations unless dimensioned. Route as required completing the wiring system.

PART 2 PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. Minimum Size: 3/4 inch for power wiring and 1 inch for low voltage wiring unless noted otherwise.

B. Size conduit per ANSI/NFPA 70.

C. Underground Installations:
   1. Within Five Feet (5') from Foundation Wall Including Below Building Slab: Use rigid steel conduit or schedule 40 PVC conduit.
   2. More Than Five Feet (5') from Foundation Wall: Use rigid steel conduit or schedule 40 PVC conduit.
   3. Where PVC conduit is utilized below slab, provide transition from PVC to rigid steel prior to elbow up and then as continuous rigid conduit through slab. No PVC conduits shall penetrate vertically through concrete slab.
   4. Minimum Size: One inch.
   5. Provide warning tape.

D. Above Grade Outdoor Locations: Use rigid steel and aluminum conduit. Aluminum conduit shall not contact concrete mortar or block.

E. Above Grade In or Under Slab:
   1. Use rigid steel conduit or schedule 40 PVC conduit.
   2. Maximum Size Conduit in Slab: Total of 50% of pour depth.
   3. Minimum Size: One inch.
   4. Where PVC conduit is utilized below slab, provide transition from PVC to rigid steel prior to elbow up and then as continuous rigid conduit through slab. No PVC conduits shall penetrate vertically through concrete slab. Unless PVC conduit is stalled below bottom-fed ground mounted equipment. PVC conduits may penetrate the slab as long as a box-out is provided in the slab to allow for conduit to pass through. Backfill box-out with pea gravel once conduits have been installed.

F. Wet and Damp Locations:
   1. Use rigid steel conduit and intermediate metal conduit.

G. Dry Locations:
   1. Concealed: Use rigid steel conduit, intermediate metal conduit or electrical metallic tubing.
   2. Exposed: Use rigid steel conduit, intermediate metal conduit or electrical metallic tubing.

2.02 CONDUIT TYPES

A. Metal Conduit:
   1. Rigid Steel Conduit: ANSI C80.1
   2. Rigid Aluminum Conduit: ANSI C80.5
   3. Intermediate Metal Conduit (IMC): Rigid steel
   4. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.

B. Flexible Metal Conduit:

1. Description: Interlocked steel construction.
2. Fittings: ANSI/NEMA FB 1.

C. Liquidtight Flexible Metal Conduit:
1. Description: Interlocked steel construction with PVC jacket.
2. Fittings: ANSI/NEMA FB 1.

D. Electrical Polyvinyl Chloride (PVC):
1. Description: Synthetic Thermoplastic
2. Fittings: NEMA TC3/UL 651
3. Joints: ASTM D2855 solvent weld with ASTM D2564 solvent cement.

E. Electrical Metallic Tubing (EMT):
1. Description: ANSI C80.3; galvanized tubing.
2. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel compression type with steel lock nut, and ring or steel setscrew fittings.

F. Colored Electrical Metallic Tubing (EMT)
1. Conduit installed in areas where ceiling/structure will be painted by the general contractor, standard (non-colored) conduit shall be provided and installed.
2. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel compression type with steel lock nut, and ring or steel setscrew fittings. Install compression type fittings in all wet and damp areas.
3. Conduit for the following systems shall be Allied EZ-Pull True Color EMT.
a. Colored Conduit Schedule:
1) Red: Fire Alarm
2) Blue: Temperature Controls/Door Access
3) Orange: All 277/480V power and lighting
4) Yellow: Data/Voice/Fiber
5) Green: Emergency power

G. Pre-manufactured Fixture Whips:
1. Manufacturers:
a. Southwire
b. EPCO
c. Engineer approved equal.
2. Description: UL listed flexible conduit with conductors and die-cast screw connectors on the end.
3. Size: no longer than 6', 3/8" diameter.
4. Wire: 14 AWG minimum for lighting and required by the load.
5. Install between junction box and light fixture only in concealed and unfinished spaces. Use interior raceway or surface raceway where exposed in finished spaces.

H. Fittings and Conduit Bodies:
1. NEMA TC 3
2. Install offsets at surface boxes.
3. Install single hole strap connectors on all exposed conduit one inch (1") and smaller.

2.03 BOX TYPES

A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide a low voltage partition divider plate for applications where low voltage and line voltage circuits share the same outlet box.

B. Outlet Boxes:

1. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel. Minimum of 4 x 4 square with depth of 2-1/8 inch.
    a. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported. Include 1/2 inch male fixture studs where required.
    b. Concrete Ceiling Boxes: Concrete Type.
2. Sheet Metal Communications Boxes: ANSI/NEMA OS 1, galvanized steel. Minimum of 4-11/16 inch square with a depth of 2-1/8 inch.
    a. Refer to the drawings for plaster ring size/opening.

C. Cast Boxes: NEMA FB 1, type #FD, cast alloy. Provide gasket cover by box manufacturer.

D. Floor Boxes:
1. ANSI/NEMA OS 1, semi-adjustable.
2. Material: Formed steel.
3. Shape: Rectangular.
4. Conform to regulatory requirements to concrete tight floor boxes.

E. Pull and Junction Boxes:
1. Sheet Metal Boxes: NEMA OS 1 galvanized steel.
2. Surface Mounted Cast Metal Box: NEMA 250, type #4 and #6, flat-flanged, surface mounted junction box:
    a. Material: Galvanized cast iron.
3. Cover: Furnish with ground flange, neoprene gasket and stainless steel cover screws.
4. Fiberglass Hand Holes:
    a. Die molded fiberglass hand holes.
    b. Cable Entrance: Precut 6" x 6" cable entrance at center bottom of each side.
    c. Cover: Fiberglass weatherproof cover with nonskid finish and light traffic rating.

PART 3 EXECUTION

3.01 CONDUIT INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation."

B. Arrange supports to prevent misalignment during wiring installation.

C. Support conduit using coated steel, malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

D. Group related conduit support using conduit rack. Construct rack using steel channel and provide space on each for 25% additional conduits.

E. Fasten conduit supports to building structure and surfaces.

F. Do not support conduit with perforated pipe straps. Remove wire used for temporary supports.

G. Do not use spring steel clips and clamps for support.

H. Install compression type fittings in all wet and damp areas.

I. Do not attach conduit to ceiling support wires.

J. Arrange conduit to maintain headroom and present neat appearance.

K. Route exposed conduit parallel and perpendicular to walls.

L. Route conduit installed above accessible ceilings, parallel and perpendicular to walls.

M. Route the conduit in and under slab from point-to-point.

N. Do not cross conduits in slab.

O. Maintain adequate clearance between conduit and piping.

P. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degree F.

Q. Cut conduit square using saw or pipe cutter; de-burr cut ends.

R. Bring conduit to shoulder of fittings; fasten securely.

S. Use conduit hubs to fasten conduit to cast boxes.

T. A run of conduit shall not contain more than the equivalent of four (4) quarter bends (360 degrees), including those bends located immediately at the outlet or body. Use conduit bodies to make sharp changes in direction (as around beams). Use hydraulic one-shot bender to fabricate bends in metal conduit larger than two inch (2") size. All conduit shall be held right to structure.

U. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

V. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.

W. Provide suitable pull string in each empty conduit except sleeves and nipples.

X. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

Y. Ground and bond all conduits.

Z. Identify conduit.

AA. Use flexible and liquidtight conduits where required by NEC.

BB. Flexible conduit up to six feet (6') in length can be used to connect mechanical equipment with motors, compressors, light fixtures or unless directed by engineer.

CC. Install insulated bushings on all conduits and sleeves serving low voltage wiring prior to pulling wire unless otherwise noted.

DD. Install grounded insulated bushings on all conduits and sleeves serving data wiring prior to pulling wire unless otherwise noted.

EE. All low voltage conduits shall be sized to have less than 40% fill. Each penetration through a surface of any kind shall have a conduit sleeve with insulated bushings.

FF. Junction boxes shall not be installed over four foot (4') above accessible ceiling without prior written approval by owner.

GG. Conduits which enter communications entrance facilities shall extend 4 inches above the finished floor or 3 inches through the wall.

HH. Minimum bend radius for communications conduits:
    1. For conduits 2" or less, maintain a minimum bend radius of (6) times the actual inside diameter of the conduit.
    2. For conduits greater than 2", maintain a minimum bend radius of (10) times the actual inside diameter of the conduit.

II. Communications conduits shall have no more than two (2) 90 degree bends between pull points and contain no continuous sections longer than 100 feet. Insert pull points or pull boxes for conduits exceeding 100 feet in length.
    1. A third bend is acceptable if:
        a. The total run is not longer than (33) feet.
        b. The conduit size is increased to the next trade size.

JJ. No continuous section of conduit may exceed 100 feet. Utilize pull boxes as necessary. Refer to the pull box execution section for more information.

KK. All wiring in the same conduit shall be from the same source and have the same voltage except where approved by the owner.

LL. Exterior rooftop pathways shall be supported above roofing membrane utilizing rubber type support bases with 12 ga. galvanized channel supports (Copper B-Line Dura-Block or equivalent). Install minimum 7/8" or compliant with current NEC requirements.

MM. For conduit installed in precast concrete walls or floors, it shall be acceptable to utilize Schedule 40 PVC conduit in lieu of EMT.

NN. All exposed conduit routing in common and public areas shall be coordinated prior to rough-in at an on-site construction meeting between the design team and contractor.

3.02 BOX INSTALLATION

A. Install boxes in accordance with NECA "Standard of Installation."

B. Install electrical boxes in locations as shown on the drawings and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

C. Set wall mounted boxes at elevations to accommodate mounting heights as indicated.

D. Electrical boxes are shown on the drawings in approximate locations unless dimensioned. Adjust box location up to ten foot (10') if required to accommodate intended purpose. Verify with architectural drawings and elevations for additional information.

E. Orient boxes to accommodate wiring device orientation.

F. Maintain headroom and present neat mechanical appearance.

G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Junction boxes shall not be installed over four foot (4') above accessible ceilings.

H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than six inches (6") from ceiling access panel or from removable recessed luminaire.

I. Fire-stop boxes to preserve fire resistance rating of partitions and other elements. Boxes may be installed within a minimum of 24 inch separation with written approval prior to installation.

J. Coordinate mounting heights and locations of outlets mounted above counters, benches, and back splashes.

K. Locate outlet boxes to allow luminaires positioned as shown on the drawings. If light fixture locations conflict with ceiling plans, the electrical contractor shall document discrepancies and send to the engineer for clarification.

L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

M. Use flush mounting outlet box in finished areas.

N. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

O. Do not install flush mounting box back-to-back in wall, provide minimum six inch (6") separation.

P. Provide minimum 24 inch separation for receptacles in acoustic rated walls. Provide sound blocking putty where lighting control devices are located in the same stud cavity.

Q. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

R. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

S. Use adjustable steel channel fasteners for hung ceiling outlet box.

T. Do not fasten boxes to ceiling support wires.

U. Support boxes independently of conduit.

V. Use gang box where more than one device is mounted together. Do not use sectional box.

W. Use gang box with plaster ring for single device outlets.

X. Use cast outlet box in exterior locations exposed to the weather and wet locations.

Y. Set floor boxes level.

Z. Large Pull Boxes: Use set screw enclosure in interior dry locations, surface-mounted cast metal box in other locations.

AA. Use stamped steel bridges to fasten flush mounting outlet box between studs.

BB. Group devices associated with each other eight inches (8") on center (i.e. receptacle, data, voice outlet).

CC. All floor mounted device locations shall have a dimensioned drawing from the Architect prior to installation.

3.03 PULLBOXES

A. Size communications cabling pull boxes according to the following:

Conduit Trade Size	Width	Length	Depth	Width Increase for Additional Conduit
1"	4"	16"	3"	2"
1-1/4"	6"	20"	3"	3"
1-1/2"	8"	28"	4"	4"
2"	8"	36"	4"	5"
2-1/2"	10"	42"	5"	6"
3"	12"	48"	5"	6"
4"	16"	60"	8"	6"

B. Directional changes within a pullbox shall not be allowed. Conduit entering the box shall have conduit leaving the box from the opposite side. Do not use a pull box to make 90 degree turns.

C. Install pullboxes in conveniently accessible locations.

D. Where identified on drawings as lockable, key all pullboxes the same.

E. Label all pull boxes. Handwritten labels shall not be accepted.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Install conduit using materials and method to preserve fire resistance rating of partitions and other elements.

B. Piping and Ductwork: Route conduits through roof openings or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified.

C. Coordinate installation of outlet and junction boxes for equipment connection.

3.05 ADJUSTING

A. Adjust flush-mounting outlets to make front flush with finished wall material.

B. Install knockout closures in unused box openings.

C. Adjust floor box flush with finish flooring material.

3.06 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

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SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels
B. Wire markers
C. Conduit markers
D. Underground warning tape
E. Tracer wires
F. Identification

1.02 REFERENCES

A. NFPA 70 - National Electrical Code
B. NFPA 70E - Standard for Electrical Safety in the Workplace

1.03 SUBMITTALS

A. Product Data: Provide catalog data for nameplates, labels and markers.
B. Samples: Submit two nameplates 4" x 4" in size illustrating materials and engraving quality.
C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.
B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 NAMEPLATES AND LABELS

A. Nameplates:
   1. Normal Power: Engraved three-layer laminated plastic white letters on blue background.
   2. Critical Power: Engraved three layer laminated plastic black letters on yellow background.
   3. Stand-by: Engraved three-layer laminated plastic black letters on orange background.
   4. Life Safety Power: Engraved three-layer laminated plastic white letters on green background.

B. Locations:
   1. All electrical distribution and control equipment enclosure.
      a. Switchboards and Panelboards: Line 1 shall state "Panel Name"; Line 2 shall state "Fed by Panel Name" as required by NEC section 408.4(B).
   2. Communication cabinets.
   3. Single mounted breaker.
   4. Transfer switch.
   5. Transformer.
   6. Fire alarm devices.

C. Letter Size:
   1. Use 1/8 inch letters for identifying individual equipment and loads.
   2. Use 1/4 inch letters for identifying grouped equipment and loads.
   3. Use 1/4 inch letters for identifying communications cabinets, transfer switches and transformers.

D. Labels: Embossed adhesive tape with 3/16 inch white letters on black background. Use only for identification of individual wall switches and receptacles, control device stations, and communication outlets.

2.02 WIRE MARKERS

A. Description: Tape feeders to indicate phases.
   1. Marker colors for 277/480V shall be as follows: phase A shall be brown, phase B shall be yellow, and phase C shall be orange. Neutral shall be gray with tracer matching phase color.
   2. Marker colors for 120/208V shall be as follows: phase A shall be black, phase B shall be red, and phase C shall be blue. Neutral shall be white with tracer matching phase color.

B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.

C. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated.
   2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams.

2.03 CONDUIT MARKERS

A. Location: Mark conduit longer than 20 feet.

B. Description: Plastic tape conduit markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings indicating panel and circuit number.

C. Spacing: 30 feet on center.

D. Color:
   1. 480 Volt System: Orange
   2. 208 Volt System: Black
   3. Fire Alarm System: Red
   4. Other Systems: Green

E. Legend:
   1. 480 Volt System: H- (name of feeder)
   2. 208 Volt System: L- (name of feeder)
   3. Fire Alarm System: FA

2.04 UNDERGROUND WARNING TAPE

A. Manufacturers:
   1. Seaton
   2. Engineer approved equal.

B. Description: Plastic four inch (4") wide tape, detectable type, colored RED with suitable warning legend describing buried electrical lines and inscribed "CAUTION - ELECTRIC LINE BURIED BELOW".

C. Location: Along length of each underground conduit.

2.05 TRACER WIRES

A. The electrical contractor shall provide a solid #10 AWG Tracer wire in each below grade conduit serving the electrical and communication systems. Tracer wires shall be labeled at each location of accessibility.

2.06 IDENTIFICATION

A. Identify All Junction Boxes With Appropriate Marker As Follows:
   1. 480 Volt System: Orange (circuit name and number)
   2. 208 Volt System: Black (circuit name and number)
   3. Fire Alarm System: Red

B. Write the circuit number of each device inside the device box (not ON the device cover). All receptacles and light switches (new and existing) shall have the final circuit number installed on each device cover with a nylon label. Coordinate exact requirements with the owner prior to installation.

C. Temporary label all outlets and switches with circuit numbers.

D. Write the panel and circuit number for each device inside the device box with permanent marker. Etch (metallic) and emboss (nylon) all outlet and switch cover plates with panel and circuit number. Coordinate and verify exact labeling requirements with the owner. Labeling shall include Floor, Panel#Circuit (X, XXX#XX).

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 INSTALLATION

A. Install nameplate and label parallel to equipment lines.

B. Secure nameplate to equipment front using screws.

C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.

D. Identify underground conduits or wiring using one underground warning tape per trench at three inch (3") below finished grade.

END OF SECTION

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SECTION 26 05 73
ARC FLASH HAZARD ANALYSIS AND OVERCURRENT DEVICE COORDINATION STUDY

PART 1 GENERAL

1.01 SCOPE

A. The contractor shall furnish short-circuit and protective device coordination studies as prepared by the electrical equipment manufacturer or an approved engineering firm.

B. The contractor shall furnish an Arc-Flash Hazard Analysis Study per the requirements set forth in NFPA 70E - Standard for Electrical Safety in the Workplace. The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA70E, Annex D.

C. The scope of the studies shall include all new distribution equipment supplied by the equipment manufacturer under this contract

1.02 REFERENCES

A. IEEE 141 - Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems

B. IEEE 242 - Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems

C. IEEE 399 - Recommended Practice for Industrial and Commercial Power System Analysis

D. IEEE 241 - Recommended Practice for Electric Power Systems in Commercial Buildings

E. IEEE 1015 - Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems

F. IEEE 1584 - Guide for Performing Arc Flash Hazard Calculations

G. ANSI C57.12.00 - Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers

H. ANSI C37.13 - Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures

I. ANSI C37.010 - Standard Application Guide for AC High Voltage Circuit Breakers Rated Enclosures

J. ANSI C 37.41 - Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories

K. NFPA 70 - National Electrical Code, latest edition

L. NFPA 70E - Standard for Electrical Safety in the Workplace

1.03 RELATED SECTIONS

A. Specification Section 26 1300 - Distribution Switchgear

B. Specification Section 26 2200 - Transformers

C. Specification Section 26 2416 - Panelboards

D. Specification Section 26 2816 - Enclosed Switches

1.04 SUBMITTALS FOR REVIEW/APPROVAL

A. The short-circuit and protective device coordination studies shall be submitted to the design engineer prior to release of equipment drawings for manufacturing. If formal completion of the studies may cause delay in equipment manufacturing, approval from the engineer may be obtained for preliminary submittal of sufficient study data to ensure that the selection of device and characteristics will be satisfactory.

1.05 SUBMITTALS FOR CONSTRUCTION

A. The results of the short-circuit, protective device coordination and arc flash hazard analysis studies shall be summarized in a final report. One (1) electronic complete final report shall be submitted for review in PDF format.

B. The report shall include the following sections:
   1. Executive Summary.
   2. Descriptions, purpose, basis and scope of the study
   3. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short circuit duties
   4. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip unit settings, fuse selection
   5. Fault current calculations including a definition of terms and guide for interpretation of the computer printout
   6. Details of the incident energy and flash protection boundary calculations
   7. Recommendations for system improvements, where needed
   8. One-line diagram

C. Arc flash labels shall be provided in hard copy only.

1.06 QUALIFICATIONS

A. The short-circuit, protective device coordination and arc flash hazard analysis studies shall be conducted under the supervision and approval of a Registered Professional Electrical Engineer skilled in performing and interpreting the power system studies.

B. The Registered Professional Electrical Engineer shall be a full-time employee of the equipment manufacturer or an approved engineering firm.

C. The Registered Professional Electrical Engineer shall have a minimum of five (5) years of experience in performing power system studies.

D. Engineering firms requesting approval shall demonstrate experience with Arc Flash Hazard Analysis by submitting names of at least ten actual arc flash hazard analysis it has performed in the past year.

PART 2 PRODUCT

2.01 STUDIES

A. The contractor shall furnish short-circuit and protective device coordination studies as prepared by the equipment manufacturer or an approved engineering firm.

B. The contractor shall furnish an arc flash hazard analysis study per NFPA 70E - Standard for Electrical Safety in the Workplace, reference Article 130.3 and Annex D.

2.02 DATA COLLECTION

A. The contractor shall furnish all data as required by the power system studies. The engineer performing the short-circuit, protective device coordination and arc flash hazard studies shall furnish the contractor with a listing of required data immediately after award of the contract. The contractor shall expedite collection of data to assure completion of the studies as required for final approval of the distribution equipment shop drawings and/or prior to the release of the equipment for manufacturing.

B. Source combination may include present and future motors and generators.

C. Load data utilized may include existing and proposed loads obtained from the contract documents provided by owner or contractor.

D. If applicable, include fault contribution of existing motors in the study. The contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

2.03 SHORT-CIRCUIT AND PROTECTIVE DEVICE EVALUATION STUDY

A. Use actual conductor impedances if known. If unknown, use typical conductor impedances based on IEEE Standard 141-1993.

B. Transformer design impedances shall be used when test impedances are not available.

C. Provide the following:
   1. Calculation methods and assumptions
   2. Selected base per unit quantities
   3. One-line diagram of the system being evaluated
   4. Source impedance data, including electric utility system and motor fault contribution characteristics
   5. Tabulations of calculated quantities
   6. Results, conclusions, and recommendations.

D. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each:
   1. Electric utility's supply termination point
   2. Incoming switchgear
   3. Unit substation primary and secondary terminals
   4. Low voltage switchgear
   5. Motor control centers
   6. Standby generators and automatic transfer switches
   7. Branch circuit panelboards
   8. Other significant locations throughout the system.

E. For grounded systems, provide a bolted line-to-ground fault current study for areas as defined for the three-phase bolted fault short-circuit study.

F. Protective Device Evaluation:
   1. Evaluate equipment and protective devices and compare to short circuit ratings
   2. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses
   3. Notify Owner in writing, of existing, circuit protective devices improperly rated for the calculated available fault current.

2.04 PROTECTIVE DEVICE COORDINATION STUDY

A. Proposed protective device coordination time-current curves (TCC) shall be displayed on log-log scale graphs.

B. Include on each TCC graph, a complete title and one-line diagram with legend identifying the specific portion of the system covered.

C. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

D. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.

E. Plot the following characteristics on the TCC graphs, where applicable:
   1. Electric utility's overcurrent protective device
   2. Medium voltage equipment overcurrent relays
   3. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands
   4. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands
   5. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves
   6. Conductor damage curves

7. Ground fault protective devices, as applicable
8. Pertinent motor starting characteristics and motor damage points, where applicable
9. Pertinent generator short-circuit decrement curve and generator damage point
10. The largest feeder circuit breaker in each motor control center and applicable panelboard.

F. Provide adequate time margins between device characteristics such that selective operation is provided, while providing proper protection.

2.05 ARC FLASH HAZARD ANALYSIS

A. The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA70E, Annex D.

B. The flash protection boundary and the incident energy shall be calculated at all significant locations in the electrical distribution system (switchboards, switchgear, motor-control centers, panelboards, busway and splitters) where work could be performed on energized parts.

C. The Arc Flash Hazard Analysis shall include all significant locations in 240 volt and 208 volt systems fed from transformers equal to or greater than 125 kVA where work could be performed on energized parts.

D. Safe working distances shall be based upon the calculated arc flash boundary considering an incident energy of 1.2 cal/cm2.

E. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations

F. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum and will assume a minimum motor contribution (all motors off). Conversely, the maximum calculation will assume a maximum contribution from the utility and will assume the maximum amount of motors to be operating. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable.

G. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators should be decremented as follows:
1. Fault contribution from induction motors should not be considered beyond 3-5 cycles.
2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g. contributions from permanent magnet generators will typically decay from 10 per unit to 3 per unit after 10 cycles).

H. For each equipment location with a separately enclosed main device (where there is adequate separation between the line side terminals of the main protective device and the work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.

I. When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.

J. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

K. Arc Flash calculations shall be based on actual overcurrent protective device clearing time. Maximum clearing time will be capped at 2 seconds based on IEEE 1584 section B.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

2.06 REPORT SECTIONS

A. Input data shall include, but not be limited to the following:
   1. Feeder input data including feeder type (cable or bus), size, length, number per phase, conduit type (magnetic or non-magnetic) and conductor material (copper or aluminum).
   2. Transformer input data, including winding connections, secondary neutral-ground connection, primary and secondary voltage ratings, kVA rating, impedance, % taps and phase shift.
   3. Reactor data, including voltage rating, and impedance.
   4. Generation contribution data, (synchronous generators and Utility), including short-circuit reactance (X”d), rated MVA, rated voltage, three-phase and single line-ground contribution (for Utility sources) and X/R ratio.
   5. Motor contribution data (induction motors and synchronous motors), including short circuit reactance, rated horsepower or kVA, rated voltage, and X/R ratio.

B. Short-Circuit Output Data shall include, but not be limited to the following reports:
   1. Low Voltage Fault Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
      a. Voltage
      b. Calculated fault current magnitude and angle
      c. Fault point X/R ratio
      d. Equivalent impedance
   2. Momentary Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
      a. Voltage
      b. Calculated symmetrical fault current magnitude and angle
      c. Fault point X/R ratio
      d. Calculated asymmetrical fault currents
         1) Based on fault point X/R ratio
         2) Based on calculated symmetrical value multiplied by 1.6
         3) Based on calculated symmetrical value multiplied by 2.7
      e. Equivalent impedance
   3. Interrupting Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
      a. Voltage
      b. Calculated symmetrical fault current magnitude and angle
      c. Fault point X/R ratio
      d. No AC Decrement (NACD) Ratio
      e. Equivalent impedance
      f. Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a symmetrical basis
      g. Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a total basis

C. Recommended Protective Device Settings:
   1. Phase and Ground Relays:
      a. Current transformer ratio
      b. Current setting
      c. Time setting
      d. Instantaneous setting

e. Recommendations on improved relaying systems, if applicable.

2. Circuit Breakers:
   a. Adjustable pickups and time delays (long time, short time, ground)
   b. Adjustable time-current characteristic
   c. Adjustable instantaneous pickup
   d. Recommendations on improved trip systems, if applicable.

D. Incident energy and flash protection boundary calculations
   1. Arcing fault magnitude
   2. Protective device clearing time
   3. Duration of arc
   4. Arc flash boundary
   5. Working distance
   6. Incident energy
   7. Hazard Risk Category
   8. Recommendations for arc flash energy reduction

PART 3 EXECUTION

3.01 FIELD ADJUSTMENT

A. Adjust relay and protective device settings according to the recommended settings table provided by the coordination study.

B. Make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.

C. Notify Owner in writing of any required major equipment modifications.

D. Any required changes as a result of this study shall be incorporated into a change order to the contact.

3.02 ARC FLASH WARNING LABELS

A. The contractor of the Arc Flash Hazard Analysis shall provide a 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester for each work location analyzed.

B. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the owner and after any system changes, upgrades or modifications have been incorporated in the system.

C. The label shall include the following information, at a minimum:
   1. Location designation
   2. Nominal voltage
   3. Flash protection boundary
   4. Hazard risk category
   5. Incident energy
   6. Working distance
   7. Engineering report number, revision number and issue date.

D. Labels shall be machine printed, with no field markings.

E. Arc flash labels shall be provided in the following manner and all labels shall be based on recommended overcurrent device settings.
   1. Switchboard: one arc flash label shall be provided for each vertical section containing circuit breakers or exposed conductors if covers are removable. Additionally where the Arc Flash study indicates different hazard levels on the load side and line side of the main circuit breaker appropriately indicating labels shall be provided.
   2. Panelboard, lighting panel, dimmer panel or any distribution equipment with circuit breakers: one arc flash label shall be provided for each vertical section containing circuit breakers or exposed conductors if covers are removable.

3. Multi-tub panelboards and equipment shall receive a label for each panel or equipment section.
4. Dry type transformers: one arc flash label shall be provided for each transformer 15 kVA and greater.
5. Local starter: one arc flash label shall be provided
6. Variable Frequency Drives: one arc flash label shall be provided
7. Disconnects-fused or unfused 60 amp or greater: one arc flash label shall be provided
8. Transfer Switches: one arc flash label shall be provided
9. Elevator Control Panels: one arc flash label shall be provided
10. Control panels: one arc flash label shall be provided for any panel that is served with a voltage of 277/480 volts. Panels may or may not contain motor starters and variable frequency drives. If these are present the single label on the panel is sufficient and individual labels for in the internal equipment is not required

F. Labels shall be field installed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.

END OF SECTION

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SECTION 26 09 43
DIGITAL LIGHTING CONTROL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Digital wall control
B. Digital occupancy/vacancy sensors
C. Digital daylighting sensors
D. Digital room controllers
E. Low voltage cables
F. Digital lighting control/relay panels
G. Emergency lighting control
H. Wall face plates

1.02 RELATED SECTIONS

A. Specification Section 26 0533 - Raceway and Boxes for Electrical Systems
B. Specification Section 26 2726 - Wiring Devices
C. Specification Section 26 5100 - Interior Lighting
D. Specification Section 26 5200 - Emergency Lighting Equipment
E. Specification Section 27 4100 - Audio-Visual Systems

1.03 REFERENCES

A. NECA - Standard of Installation
B. NEMA WD 1 - General Requirements for Wiring Devices
C. NEMA WD 6 - Dimensional Requirements for Wiring Devices
D. NFPA 70 - National Electrical Code
E. UL 916 - Energy Management Equipment
F. UL 924 - Standard for Emergency Lighting and Power Equipment

1.04 SUBMITTALS

A. Product Data: Provide catalog data for nameplates, installation instructions, labels and markers, ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
C. Shop Drawings:
    1. Composite wiring and/or schematic diagram of each control circuit as proposed to be installed.
    2. Show exact location of all digital devices, including at minimum sensors, load controllers, and switches for each area on reflected ceiling plans.
    3. Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies and proof that the sensor is suitable for the proposed application.
    4. Network riser diagram including floor and building level details. Include network cable and radio frequency specification and end-of-line termination details, if required. Illustrate points of connection to integrated systems. Coordinate integration with mechanical and/or other trades.

5. Product information sheets for all components and wiring provided. Include standard options for each product and color offerings.
6. Submit manufacturer sensor coverage patterns applicable to this project. For areas requiring multiple sensor devices for appropriate coverage, submit specific manufacturer approved sensor layout as an overlay directly on the project drawings

D. Closeout Submittals:
1. Project Record Documents: Record actual installed locations and settings for lighting control devices.
2. Operation and Maintenance Manual:
a. Include approved Shop Drawings and Product Data.
b. Include Sequence of Operation, identifying operation for each room or space.
c. Include manufacturer's maintenance information.
d. Operation and Maintenance Data: Include detailed information on device programming and setup.
e. Include startup and test reports.
3. Provide list of Extra Materials for owner to verify and sign for acknowledgement of receiving

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years' experience.

B. All room control devices and panels shall be provided with a five-year limited manufacturer's warranty, including one for one device replacement.

1.06 REGULATORY REQUIREMENTS

A. Digital Lighting Management System shall accommodate the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories that suit the required lighting and electrical system parameters.

B. Conform to requirements of NFPA 70.

C. Provide products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

D. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.

1.07 APPROVED MANUFACTURERS

A. All equipment specified in this specification shall be manufactured by one of the below listed companies unless specified elsewhere. Model numbers stated in this specification are for basis of design information only.
1. Digital Lighting Control Systems:
a. Current Control Solutions - NX Series (Basis of Design)
b. Lutron
c. Acuity Brands
d. Leviton
e. Wattstopper
f. Avi-On
g. Engineer approved equals.

1.08 SYSTEM TYPE

A. System shall be wired.

PART 2 PRODUCTS

2.01 DIGITAL WALL CONTROL

A. Refer to the lighting sequence of operations or schedule on the drawings for additional requirements.

B. Low voltage momentary, self-configuring, digitally addressable pushbutton on/off, and scene selection.
   1. Basis of Design: Current NX Series - Smart Switch
   2. Description: Fully addressable pushbutton switch with LED status indicators, up to 6 button configuration with on/off, raise/lower and dimming functionality in a single gang. Decorator style design.
   3. Part of a digital lighting control system and can control any load(s) connected to room controller.
   4. Load and Scene button function may be reconfigured for individual buttons from Load to Scene, and vice versa. Scene patterns may be saved to any button. Once set, buttons may be digitally locked to prevent overwriting of the preset levels.
   5. Device shall have removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement shall be completed without removing the switch from the wall.
   6. All digital parameter data programmed into an individual wall control shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.

2.02 DIGITAL OCCUPANCY/VACANCY SENSORS

A. Refer to the lighting sequence of operations or schedule on the drawings for additional requirements.

B. Self-configuring, digitally addressable, calibrated wall or ceiling mounted; passive infrared (PIR), ultrasonic or dual technology. Integrated daylight sensor for daylight harvesting.
   1. Basis of Design. Current NX Series - OMNI Indoor Ceiling Mount Sensor.
   2. Description: 4-inch diameter plastic sensor, 12-24 VDC, Selectable PIR or ultrasonic. Threaded mounting base.
   3. Sensors shall be able to be digitally calibrated in the field with the ability to adjust the sensitivity and time delay.
   4. Sensor shall be programmed to control specific loads within a local network. Devices shall be able to be assigned to a specific load within the room without wiring or special tools.
   5. Sensor shall have adjustable re-trigger time for all manual-on loads.
   6. All parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.
   7. Wire all per manufacturer's recommendations.
   8. Wire multiple sensors serving the same area to operate as a single unit.
   9. Provide and install room controllers as required to obtain switching pattern shown on the drawings.
   10. Sensors shall have a time delay that is can be adjusted from 5 to 30 minutes, set in field.
   11. Provide with optional relay (N/O + N/C contacts, SPDT, 500 mA rated @ 24VDC) for mechanical integration and local HVAC control.

2.03 DIGITAL DAYLIGHTING SENSORS

A. Refer to drawings for schedule with basis of design information.

B. Devices shall provide automatic switching, bi-level, or tri-level or dimming daylight harvesting capabilities for any load type connected to the controller or panel and include the following features:

1. Switching photo sensors shall provide a field-selectable dead band, or a separation, between the “ON Setpoint” and the “OFF Setpoint” that will prevent the lights from cycling excessively after they turn off.
2. Dimming photo sensors shall provide the option, when the daylight contribution is sufficient, of turning lights off or dimming lights to a field-selectable minimum level.
3. Photo sensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second
4. Photo sensors shall provide adjustable cut-off time. Cut-off time is defined by the number of selected minutes the load is at the minimum output before the load turns off. Selectable range between 0-240 minutes including option to never cut-off.
5. All parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.
6. Provide accessories to accommodate multiple mounting methods and building materials. Photo sensors may be mounted on a ceiling tile, skylight light well, suspended lighting fixture or backbox.
7. Any load or group of loads in the room may be assigned to a daylighting zone controlled by photo sensor.

C. Closed loop sensors shall measure the ambient light in the space and control a single lighting zone and include the following features:
1. An internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from bright sources outside of this cone.
2. Automatic self-calibration, initiated from the photo sensor, a wireless configuration tool or a PC with appropriate software.
3. Automatic creation of application-specific setpoints following self-calibration. For switching operation, an adequate dead band between the ON and OFF setpoints shall prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of loads.

2.04 DIGITAL ROOM CONTROLLERS

A. Digital controllers for lighting zones and fixtures that automatically bind room loads to the connected control devices in the space without commissioning or the use of any tools. Provide controllers to match the room lighting and plug load control requirements.

B. Devices shall automatically configure the room to the most energy-efficient sequence of operation based upon the devices in the room.

C. Self-configuring, digitally addressable one, two or three relay plenum-rated controllers for on/off or selected dimming control.
1. Basis of Design: Current Control Solutions - NX Room Controller
2. Controller shall match the room lighting sequence and control type requirements.
3. Dual voltage (120/277 VAC, 60 Hz) capable rated for 20A total load
4. Wire per manufacturer's recommendations.
5. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power: Turn on to 100 percent, turn off, turn on to last level.
6. Dimming room controllers shall have options for 0-10 volt or line voltage forward phase control dimming outputs and integral current monitoring capabilities.
7. Devices shall have a minimum of two RJ-45 local network ports.
8. All parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.
9. Room controller shall be capable of being programmed through Bluetooth technology via a free app and via a local area connection.

2.05 LOW VOLTAGE CABLES

A. Field-Terminated
   1. Digital room devices shall connect to the local network using field-terminated cables, which provide both data and power to room devices.
   2. Cable shall be plenum rated Cat 5e with RJ-45 connectors. Maximum cable run, and cable ratings shall meet manufacturer's requirements.
   3. Each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the work.
   4. Low voltage wiring topology must comply with manufacturer's specifications.
   5. Installing contractor shall meet all qualifications discussed in section 27 1005 - Telecommunications Cabling Infrastructure.

2.06 DIGITAL LIGHTING CONTROL/RELAY PANELS

A. Hardware: Provide lighting control panels in the locations and capacities as indicated on the drawing and schedules. Each panel shall be of modular construction and consist of the following components:
   1. Enclosure/Tub shall be NEMA 1, sized to accept an interior with 1 - 24 relays and 6 four-pole contactors.
   2. Cover shall be configured for surface or flush wall mounting of the panel as indicated on the plans. Panel cover shall have a hinged and lockable door with restricted access to line voltage section of the panel.
   3. Interior assembly shall be supplied as a factory assembled component specifically designed and listed for field installation. Interior construction shall provide total isolation of high voltage (Class 1) wiring from low voltage (Class 2) wiring within the assembled panel. Interior assembly shall include intelligence boards, power supply, DIN rails for mounting optional Class 2 control devices, and individually replaceable latching type relays. Panel interiors shall include the following features:
      a. Removable, plug-in terminal blocks with connections for all low voltage terminations.
      b. Individual terminal block, override pushbutton, and LED status light for each relay.
      c. Direct wired switch inputs associated with each relay shall support 2-wire momentary switches only.
      d. Digital inputs shall support 1-, 2-, 3-, 4-, and 8-button digital switches; digital IO modules capable of receiving 0-5V or 0-10V analog photocell inputs; digital IO modules capable of receiving momentary or maintained contact closure inputs or analog sensor inputs; digital daylighting sensors; and digital occupancy sensors. Inputs are divided into two separate digital networks, each capable of supplying 250mA to connected devices.
      e. True relay state shall be indicated by the on-board LED and shall be available to external control devices and systems via BACnet.
      f. Automatically sequenced operation of relays to reduce impact on the electrical distribution system when large loads are controlled simultaneously.
   4. Single-pole latching relays with modular plug-in design. Relays shall be properly rated to serve the lighting, motor and plug-load it controls. Relays shall be replaceable (1/2 inch KO mounting with removable Class 2 wire harness); actuator on relay housing to provide manual override and visual status indication, accessible from Class 2 section of panel; dual line and load terminals able to support two #14 - #12 solid or stranded conductors; tested to 300,000 mechanical on/off cycles.
   5. Power supply shall be a multi-voltage transformer assembly with rated power to supply all electronics, occupancy sensors, switches, pilot lights, and photocells as necessary to meet the project requirements. Power supply to have internal over-current protection with automatic reset and metal oxide varistor protection.
   6. Where indicated, lighting control panels designated for control of emergency lighting shall be provided with factory installed provision for automatic by pass of relays controlling

emergency circuits upon loss of normal power. Panels shall be properly listed and labeled for use on emergency lighting circuits and shall meet the requirements of UL924 and NFPA 70 - Article 700.

7. Integral system clock shall provide scheduling capabilities for panel-only projects without other control options.
    a. Clock capability of each panel shall support the time-based energy saving requirements of applicable local energy codes.
    b. Clock module shall provide astronomic capabilities, time delays, blink warning, daylight savings, and holiday functions and will include a battery backup for clock function and program retention in non-volatile FLASH memory and shall retain user programming and time for a minimum of 10 years.
    c. Clock capability of each panel shall operate on a basis of ON/OFF or Normal Hours/After Hours messages to automation groups that implement pre-configured control scenarios.
8. Lighting control panel can operate as a stand-alone system, or can support schedule, group, and photocell control functions, as configured in a Segment Manager controller, via a segment network connection.
9. Lighting control panel shall support digital communications to facilitate the extension of control to include interoperation with building automation systems and other intelligent field devices. Digital communications shall be RS485 MS/TP-based using the BACnet protocol.

2.07 EMERGENCY LIGHTING CONTROL DEVICES

A. UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides normal ON/OFF control of emergency lighting along with the normal lighting. Upon normal power failure, the emergency lighting circuit will close, forcing the emergency lighting ON at 100% output until normal power is restored. Features include:
    1. Basis of Design: Current Control Solutions - ALCR1277
    2. 120/277 volts, 50/60 Hz, 20-amp ballast rating
    3. Push to test button
    4. Auxiliary contact for remote test or fire alarm system interface
    5. Override dimming controls
    6. UL 924 devices shall be provided with relays required to illuminate egress lighting upon activation of the building fire alarm system per NFPA 101 Life Safety Code.

2.08 WALL FACE PLATES PROVIDED BY ELECTRICAL CONTRACTOR

A. Cover Plate:
    1. Basis of Design: Pass & Seymour #SS (Metal), to be confirmed by architect.
    2. Provide cover plate for all devices and provide multiple gang plates where required.

B. Jumbo Cover Plate:
    1. Basis of Design: Pass & Seymour #SSO (Metal) to be confirmed by architect.
    2. Provide cover plate for all devices and provide multiple gang plates where required.
    3. Provide jumbo plates on masonry rough-in. Verify with architect prior to work being performed.

PART 3 EXECUTION

3.01 SAMPLES

A. Upon request, electrical contractor is to provide a sample of any device specified in any available color.

3.02 COLOR

A. All colors of devices, flanges, and faceplates shall be determined during the submittal process by the Architect. In the electrical bid, include any allowances needed to allow for selection of all cataloged colors.

3.03 EXAMINATION

A. Verify that boxes are installed at proper height.

B. Verify that wall openings are neatly cut and will be completely covered by wall plates.

C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.04 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.05 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install devices plumb and level.

C. Low voltage wiring topology must comply with manufacturer's specifications

D. All line voltage connections shall be tagged to indicate circuit and switched legs.

E. Install wall plates on switches in finished areas.

F. Test all devices to ensure proper communication.

G. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.

H. All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.

I. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads shall have separate neutral.

J. Furnish the Company’s system which accommodates the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories which suit the lighting and electrical system parameters.

K. Digital controllers for lighting loads shall automatically bind the room loads to the connected devices in the space without commissioning or the use of any tools. Room controllers shall be provided to match the room lighting control requirements.

L. Devices shall have status notification that indicates: data transmission, device power, load status and configuration status.

M. Each load shall be capable of the following behavior on power up following the loss of normal power: turn on to 100%, turn off, turn on to last level.

N. All devices installed above ceilings shall be UL 2043 plenum rated.

O. All digital parameter data programmed into an individual room controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.

P. All ceiling-mounted sensing devices shall be installed at least 6 feet away from supply air terminals to avoid false activation, as per manufacturer's recommendations. Notify engineer if sensor is moved from location shown on drawings.

Q. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver.

R. Network signal integrity on low-voltage cables require that each conductor and ground wire be correctly terminated at every connected device.

S. All low voltage cabling routed exposed in common and public areas shall be installed in EMT conduit. Coordinate final conduit routings with the Architect in the field during installation.

Conduit installation shall meet all requirements listed in Section 26 0533 - Raceway and Boxes for Electrical Systems.

3.06 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Specification Section 26 0533 - Raceway and Boxes for Electrical Systems to obtain mounting heights indicated on the drawings. Before roughing in any floor devices the electrical contractor shall obtain a dimensioned drawing signed by the owner showing device locations.

B. Coordinate the placement of lighting control devices with millwork, furniture, equipment, door swings, etc. installed by others. Notify engineer of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

3.07 OVERSIGHT AND COMMISSIONING

A. At the start of construction, the contractor shall be responsible for organizing a pre-construction lighting controls meeting with contractor, manufacturer representative, owner, design team. The manufacturer rep shall provide samples of all products for review at this meeting.

B. Supplier to verify layout of occupancy sensor devices during submittal process and all suggestions are to be brought to the engineer’s attention immediately. After manufacturer’s layouts have been approved, it shall be there responsibility of the manufacturer to ensure that the system operates per lighting control sequence as detailed on construction documents.

C. Supplier is to give instructions to the electrical contractor for installation locations. Locations, shown on the drawings, are intended to provide device count for bidding. All placement must be per manufacturer's recommendations.

D. Electrical contractor to install devices per manufacturer’s layout. It shall be the responsibility of the contractor to verify that all quantities and device types are appropriate for space.

E. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.

F. Supplier is to visit site, calibrate, and verify that the control of each space complies with the Sequence of Operation at substantial completion of building. Coordinate this meeting with project engineer.

G. Supplier is to visit site and confirm proper operation of all automatic occupancy devices one month after owner occupancy. Supplier shall make modifications and calibrations as needed.

H. Manufacturer shall provide the owner with one working configuration tool (device or app) with instructions on how to wireless facilitate customization of devices post occupancy.

3.08 LIGHTING CONTROL PANEL COMMISSIONING

A. Supplier is to give instructions to the electrical contractor for installation and setup.

B. Supplier is to visit site, calibrate, and verify proper operation of all lighting control panels at substantial completion of building. Coordinate this meeting with project engineer.

C. Supplier is to visit site and confirm proper operation of all lighting control panels one month after owner occupancy. Supplier shall make modifications and calibrations as needed.

3.09 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

3.10 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.11 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

3.12 EXTRA MATERIALS AND LABOR:

A. The electrical contractor shall include in their bid an allowance to install an additional five wall control devices, five ceiling control devices, two room controllers, and two UL924 emergency lighting control devices including an average 50 feet of raceway, associated wiring, back box and labor, and all accessories required to energize each device requested. Device(s) may be added anytime during the construction process as requested by the owner or design team. Any unused devices shall be turned over to the owner at the final acceptance of building.

3.13 CLOSEOUT ACTIVITIES

A. Training Visit
   1. Lighting Control System Manufacturer shall provide (4) 2-hour training sessions on-site for personnel. At 3 months, 6 months, and 1 year from occupancy. The lighting controls representative shall schedule a 2 hour meeting with the owner to review system performance and make system adjustments if needed.

B. On-site Walkthrough
   1. Lighting Control System Manufacturer shall provide a factory certified Field Service Engineer to demonstrate system functionality to the Commissioning Agent.

C. Owner Occupancy
   1. After 30 days from occupancy contractor shall adjust sensor time delays and sensitivities to meet the Owner's requirements. Provide a detailed report to the Owner of post start-up activity.
   2. Contractor shall be responsible for resetting self-learning devices that are designed to adapt to the normal use of the area of control. This should happen once the owner has full occupied the space and the areas are under normal occupancy.

END OF SECTION

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SECTION 26 22 00
TRANSFORMERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dry-Type Transformers

1.02 RELATED SECTIONS

A. Specification Section 26 0526 - Grounding and Bonding for Electrical Systems

B. Specification Section 26 0533 - Raceway and Boxes for Electrical Systems

C. Specification Section 26 2416 - Panelboards

1.03 REFERENCES

A. NFPA 70 - National Electrical Code; National Fire Protection Association; 2011

B. NEMA ST20 - Dry Type Transformers for General Applications

C. UL 1561 - Dry-Type General Purpose and Power Transformers

D. NEMA TP1 - Guide for Determining Energy Efficiency for Distribution Transformers

E. NEMA TP2 - Standard Test Method for Measuring Energy Consumption of Distribution Transformers

F. NEMA Premium Low Voltage Transformer Program

1.04 SUBMITTALS

A. Product Data: Provide outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

B. Suppliers asking consideration, as an approved equal shall submit complete, warranted performance data and physical dimensions for similar transformers. Data shall be submitted for each size specified, and shall be received by the consultant engineer no less than 10 days prior to the bid due date for consideration.

C. Test Reports: Indicate loss data, efficiency at 25%, 50%, 75% and 100% rated load, and sound level.

D. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Record actual locations of transformers in project record documents.

1.05 STANDARDS

A. Transformers 750kVA and smaller shall be listed by Underwriters Laboratories.

B. Conform to the requirements of ANSI/NFPA 70.

C. Transformers are to be manufactured and tested in accordance with NEMA ST20.

D. Transformers losses shall conform to NEMA TP1 requirements

E. Transformers losses shall be tested in accord with NEMA TP2 procedures.

PART 2 PRODUCTS

2.01 PREMIUM EFFICIENCY TRANSFORMERS

A. Manufacturers:
   1. Square D
   2. General Electric
   3. Cutler-Hammer

4. Siemens
5. Engineer approved equal.

B. Suppliers asking consideration, as an approved equal shall submit complete, warranted performance data and physical dimensions for similar transformers. Data shall be submitted for each size specified, and shall be received by the consultant engineer no less than 10 days prior to the bid due date for consideration.

C. All insulating materials are to exceed NEMA ST20 standards and be rated for 220 deg C UL component recognized insulation system.

D. Transformers 15 kVA and larger shall be 150 deg C temperature rise above 40 deg C ambient. Transformers 25 kVA and larger shall have a minimum of four - 2.5% full capacity primary taps. The exact voltages and taps are to be as designated on the drawings or the transformer schedule.

E. The maximum temperature of the top of the enclosure shall not exceed 50 deg C rise above a 40 deg C ambient.

F. Transformers shall be low loss type with minimum efficiencies 30% below NEMA TP1 when operated at 35% of full load capacity. Efficiency shall be tested in accord with NEMA TP2.

G.

SINGLE PHASE		**THREE PHASE**	
kVA	**EFFICIENCY**	**kVA**	**EFFICIENCY**
15	97.7%	15	97.89%
25	98.0%	30	98.23%
37.5	98.2%	45	98.40%
50	98.3%	75	98.60%
75	98.5%	112.5	98.74%
100	98.6%	150	98.83%
167	98.7%	225	98.94%
250	98.8%	300	99.02%
333	98.9%	500	99.14%
		750	99.23%
		1000	99.28%

H. Transformer coils shall be of the continuous wound construction and shall be impregnated with non-hygroscopic, thermosetting varnish.

I. All cores are to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500 kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.

J. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.

K. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use. The coating color shall be ANSI 49.

L. Sound Levels:

1. 15 to 50KVA - 45dB
2. 51 to 150kVA - 50dB
3. 151 to 300kVA - 55dB
4. 301 to 500kVA - 60dB
5. 501 to 700kVA - 62dB
6. 701 to 1000kVA - 64dB

M. Provide floor-mounted transformers with vibration isolating pads suitable for isolating the transformer noise from the building structure.

N. See transformer schedule on the drawings for additional notes.

PART 3 EXECUTION

3.01 INSTALLATION

A. Set transformer plumb and level, use flexible conduit, under the provisions of Specification Section 26 0533 - Raceway and Boxes for Electrical Systems. Minimum two foot (2') length for connections to transformer case. Make conduit connections to side panel of enclosure.

B. Mount wall mounted transformers using integral flanges or accessory brackets furnished by the manufacturer.

C. Mount trapeze-mounted transformers as indicated.

D. Use accessory brackets or integral flanges for all wall-mounted units.

E. Provide seismic restraints.

F. All conduit connections shall be flexible type conduit due to vibration isolation. Rigid type conduit is not acceptable.

G. Provide grounding and bonding in accordance with Specification Section 26 0526 - Grounding and Bonding for Electrical Systems.

3.02 FIELD QUALITY CONTROL

A. Inspect in accordance with NETA ATS, except Section 4.

B. Perform inspections listed in NETA ATS, Section 7.2.

3.03 ADJUSTING

A. Measure primary and secondary voltages and make appropriate tap adjustments.

B. Check for damage and tighten connections prior to energizing transformer.

END OF SECTION

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SECTION 26 24 16
PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Distribution panelboards

B. Branch circuit panelboards

1.02 RELATED SECTIONS

A. Specification Section 26 05 26 - Grounding and Bonding for Electrical System

B. Specification Section 26 05 53 - Identification for Electrical Systems

C. Specification Section 26 43 13 - Surge Protective Device

1.03 REFERENCES

A. NECA Standard of Installation (published by the National Electrical Contractors Association

B. NEMA AB1 - Molded Case Circuit Breakers

C. NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies

D. NEMA KS1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)

E. NEMA PB 1 - Panelboards

F. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less

G. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment (published by the International Electrical Testing Association)

H. NFPA 70 - National Electrical Code

1.04 SUBMITTALS

A. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

B. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Record actual locations of panelboards and record actual circuiting arrangements in project record documents.

D. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

E. It is the electrical contractors and suppliers responsibility to confirm the appropriate size and quantity of circuit breakers in the submitted panelboards with the information shown on the plan sheets, including the panelboard schedule, and the mechanical contractor prior to releasing the panelboards for construction.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.07 RATINGS

A. Definitions:
   1. Fully rated equipment shall be defined as equipment where all devices in that equipment shall carry a minimum of the AIC rating that is specified. The distribution panels, panelboards, and load centers for this project shall be fully rated unless otherwise specifically noted in the Drawings or Specifications.

1.08 MAINTENANCE MATERIALS

A. Furnish two of each panelboard key.

PART 2 PRODUCTS

2.01 DISTRIBUTION PANELBOARDS

A. Manufacturers:
   1. Square D. I-Line
   2. ABB
   3. Eaton (Cutler Hammer)
   4. Siemens
   5. Engineer approved equal.

B. Description: NEMA PB1, circuit breaker type.

C. Service Conditions:
   1. Temperature: 40 deg F.
   2. Altitude: 1000 feet.

D. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard.

E. Minimum Integrated Short Circuit Rating: See schedule on the drawings.

F. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

G. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers with common trip handle for all poles, listed as type #SWD for lighting circuits, type #HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Provide arc fault circuit breakers in all dwelling units as required by NEC Code. Do not use tandem circuit breakers. Handle ties to make multiple pole breakers are NOT permitted.

H. Molded Case Circuit Breakers with Current Limiters: NEMA AB 1, circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole. Handle ties to make multiple pole breakers are NOT permitted.

I. Current Limiting Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let through current and energy level less than permitted for same size Class RK-5 fuse. Handle ties to make multiple pole breakers are NOT permitted.

J. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated.

K. Enclosure: NEMA PB 1, type #1, cabinet box in accordance with code.

L. Cabinet Front: Surface type, fastened with concealed trim clamps. Finish in manufacturer's standard gray enamel. Concealed hinge. Flush lock all keyed alike.

M. Surge Protection Devices shall comply with Specification Section 26 4313 - Surge Protection Devices

N. Provide space for four future 200 amps, 3-phase circuit breakers unless more space is noted on the drawings.

O. If the system voltage is less than 150V and the equipment is neither grounded nor double insulated, a Class A GFCI with 4 to 6 mA trip current is required per the NEC. However, if the equipment is considered "specialty" or "special-purpose" and either grounded or double-insulated, a Class C GFCI with 20 mA trip level shall be acceptable.

2.02 BRANCH CIRCUIT PANELBOARDS

A. Manufacturers:
   1. Square D. #NQ or NF
   2. ABB
   3. Eaton (Cutler-Hammer)
   4. Siemens
   5. Engineer approved equal.

B. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

C. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard.

D. Minimum Integrated Short Circuit Rating: See schedule on the drawings.

E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers with common trip handle for all poles, listed as type #SWD for lighting circuits, type #HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Provide arc fault circuit breakers in all dwelling units as required by NEC Code. Do NOT use tandem circuit breakers. Handle ties to make multiple pole breakers are NOT permitted.

F. Current Limiting Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let through current and energy level less than permitted for same size Class RK-5 fuse. Handle ties to make multiple pole breakers are NOT permitted.

G. Enclosure: NEMA PB 1, type #1.

H. Cabinet box is to be 6" D x 20" W for 240 volt and less panelboards.

I. Cabinet Front: Flush or surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

J. Door: Provide hinged door-in-door trim.

K. Surge Protection Devices shall comply with Specification Section 26 4313.

L. All panelboards 225 amp or less, are to have either intermediate supports on the bus bars to prevent deflection, or are required to have 800 amp/square inch bus bars if the bus bars are only supported at each end of the bus.

M. Each section of multi-section panels shall have the same dimensions.

N. If the system voltage is less than 150V and the equipment is neither grounded nor double insulated, a Class A GFCI with 4 to 6 mA trip current is required per the NEC. However, if the equipment is considered "specialty" or "special-purpose" and either grounded or double-insulated, a Class C GFCI with 20 mA trip level shall be acceptable.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1 and the NECA "Standard of Installation."

B. Install panelboards plumb. Install recessed panelboards flush with wall finishes.

C. Height is to be six feet (6') to top of the panelboard. Install panelboards taller than six feet (6') with bottom no more than four inch (4") above floor.

D. Provide filler plates for unused spaces in panelboards.

E. Provide typed circuit directory for each branch circuit panelboard. Use actual room numbers and not plan room numbers. Coordinate with owner. Revise directory to reflect circuiting changes required to balance phase loads. Typed circuit directories shall be completed in Microsoft Excel. The electrical contractor shall submit a CD with all directories included.

F. Provide engraved plastic nameplates under the provisions of Specification Section 26 05 53 - Identification for Electrical Systems.

G. Provide spare conduits out of each recessed panelboard to an accessible location above ceiling and to the floor below. Minimum spare conduits: Five empty one inch (1") at each recessed panel location. Identify each as SPARE.

H. Ground and bond the panelboard enclosure.

I. Any panel field modifications and associated means and methods shall be approved by the Authority Having Jurisdiction and the equipment manufacturer. Any costs associated shall be included in the bid.

J. It shall be the responsibility of the electrical contractor to verify all wire sizes with existing and new circuit breakers prior to ordering and installing so that specified wire will properly fit into the corresponding circuit breaker.

K. Verify lug size of electrical equipment and mechanical equipment is properly sized to receive specified conductor size. Refer to one-line and the conduit/conductor chart for additional information.

3.02 FIELD QUALITY CONTROL

A. Inspect in accordance with NETA ATS.

B. Perform inspections listed in NETA ATS.

3.03 ADJUSTING

A. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20% of each other. Maintain proper phasing for multi-wire branch circuits.

3.04 BREAKER COORDINATION

A. Manufacturer shall provide all necessary circuit breaker coordination studies to determine required settings of their equipment.

B. Contractor shall coordinate any breaker settings and adjust per the manufacturers recommended adjustable breaker settings.

END OF SECTION

SECTION 26 27 17
EQUIPMENT WIRING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cord and caps

1.02 RELATED SECTIONS

A. Specification Section 26 05 19 - Electrical Power Conductors and Cables

B. Specification Section 26 05 33 - Raceway and Boxes for Electrical Systems

1.03 REFERENCES

A. NEMA WD 1 - General Purpose Wiring Devices

B. NEMA WD 6 - Wiring Devices - Dimensional Requirements

C. NFPA 70 - National Electrical Code

D. Product Data: Provide wiring device manufacturers catalog information showing dimensions, configurations, and construction.

E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.04 SUBMITTALS

A. Product Data: Provide catalog data for nameplates, labels and markers.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.06 COORDINATION

A. Obtain and review shop drawings, product data, manufacturer's wiring diagrams and manufacturer’s instructions for equipment furnished under other sections.

B. Determine connection locations and requirements.

C. Sequence rough in of electrical connections to coordinate with installation of equipment.

D. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

2.01 CORDS AND CAPS

A. Provide and install, as required, for the installation of equipment for this project. Verify that equipment scheduled for others to provide or install requires installation of cord and caps prior to bidding.

B. Attachment Plug Construction: Conform to NEMA WD 1.

C. Configuration: NEMA WD 6, match receptacle configuration at outlet provided for equipment.

D. Cord Construction: ANSI/NFPA 70, type #SO multi-conductor flexible cord with identified equipment-grounding conductor, suitable for use in damp locations.

E. Size: Suitable for connected load of equipment, length of cord and rating of branch circuit over current protection.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquid tight flexible conduit with watertight connectors in damp, wet, or sterile locations.

C. Make wiring connections using wire and cable with insulation suitable for temperature encountered in heat producing equipment.

D. Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field supplied an attachment plug is indicated.

E. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

F. Install disconnect switches, controllers, control stations, and control devices as indicated or required by code.

G. Provide interconnecting conduit and wiring between devices and equipment where indicated.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches

B. Duplex receptacles

C. Ground fault circuit interrupting receptacles

D. USB charge duplex receptacles

E. Wall plates

F. Floor boxes and service fittings

G. Emergency pushbutton

1.02 RELATED REQUIREMENTS

A. Specification Section 26 0533 - Raceway and Boxes for Electrical Systems

B. Specification Section 26 0943 - Digital Lighting Control Systems

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2010

B. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005)

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R 2008)

D. NFPA 70 - National Electrical Code; National Fire Protection Association; 2011

E. UL Standard 943 - Standard for Safety for Ground-Fault Circuit Interrupters (GFCIs)

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Manufacturer's Installation Instructions.
   1. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.
   2. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Wall Plates: One of each style, size, and finish.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 WALL SWITCHES

A. Description:
   1. Heavy Duty, AC only general-use snap switch, complying with NEMA WD 6 and WD 1.
   2. Body and Handle: Impact-resistant plastic with toggle handle. Auto-grounding strap.
   3. Ratings: Match branch circuit and load characteristics. Default rating is 20A, 120/277V, 1HP.
   4. Wiring: Back and side wire connections. Accepts #14-#10 AWG solid and stranded copper conductors.
   5. Provide #12 AWG solid pigtails at each device. Splice to building wire within outlet box.
   6. Color: Selected during submittal phase. Provide color chart upon request.

B. Types:
   1. Toggle Switches
      a. Approved Manufacturers and Models:
         1) Pass & Seymour #PS20AC
         2) Cooper #2221
         3) Hubbell #1221
         4) Leviton #1221-2
      b. Description: Single pole, double pole, 3-way, and 4-way toggle switches as indicated on plans.

2.02 DUPLEX RECEPTACLES

A. Description
   1. Style: Hard use specification grade
   2. Device Body: Impact resistant plastic with impact-resistant nylon face. Auto-grounding strap.
   3. Configuration: NEMA WD 6, type as specified and indicated.
   4. Rating: Match branch circuit and load characteristics. Default rating is 5-20R, 125V, 20A.
   5. Standards: Receptacles comply with NEMA WD 6 and WD 1.
   6. Wiring: Back and side wire connections. Accepts #14-#10 AWG solid and stranded copper conductors.
   7. Provide #12 AWG solid pigtails at each device. Splice to building wire within outlet box.
   8. Color: Selected during submittal phase. Provide color chart upon request.

B. Types
   1. Duplex Receptacles
      a. Manufacturers:
         1) Pass & Seymour #5362
         2) Cooper #5362C
         3) Hubbell #5362
         4) Leviton #5362-S
      b. Description: Traditional style, hard use specification grade duplex receptacle with wraparound grounding/mounting strap.
   2. Tamper-Resistant Duplex Receptacles
      a. Manufacturers:
         1) Pass & Seymour #TR5362
         2) Cooper #TRSGF
         3) Hubbell #HBL5362TR
         4) Leviton #5362-SG
      b. Description: UL listed tamper-resistant receptacle with thermoplastic shutters.
      c. Receptacles in all areas as noted in NEC Article 406.
   3. Weather-Resistant Receptacles
      a. Manufacturers:

1) Pass & Seymour #2097TRWR
2) Cooper #WRSGF20
3) Hubbell #GFTWRST20
4) Leviton #GFWT2

b. Description: UL listed weather-resistant receptacle.
c. Provide weather-resistant receptacles for all receptacles located in wet and damp locations as described in NEC Article 406.

2.03 GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLES

A. Receptacles: Complying with NEMA WD 6 and WD 1. Class A GFCI rated.
1. Style: Hard use specification grade
2. Device Body: Impact resistant plastic with impact-resistant nylon face. Auto-grounding strap.
3. Configuration: NEMA WD 6, type as specified and indicated.
4. Rating: Match branch circuit and load characteristics. Default rating is 5-20R, 125V, 20A.
5. Standards: Receptacles comply with NEMA WD 6 and WD 1.
6. Wiring: Back and side wire connections. Accepts #14-#10 AWG solid and stranded copper conductors.
7. Provide #12 AWG solid pigtails at each device. Splice to building wire within outlet box.
8. Color: Selected during submittal phase. Provide color chart upon request.

B. Types
1. GFCI Duplex Receptacles
a. Manufacturers:
1) Pass & Seymour #2097
2) Cooper SGF20
3) Hubbell GFRST20
4) Leviton GFNT2

b. Description: Specification grade duplex GFCI receptacle.
c. Receptacles noted as "GFI" on plans.
2. GFCI Tamper Resistant Receptacles
a. Manufacturers:
1) Pass & Seymour 2097TR
2) Cooper TRSGF20
3) Hubbell GFTRST20
4) Leviton GFTR2

b. Description: Specification grade tamper-resistant duplex GFCI receptacle.
c. Receptacles in all areas as noted in NEC Article 406.
d. Receptacles noted as "GFI" on plans.

2.04 USB CHARGE DUPLEX RECEPTACLES

A. Receptacles: Complying with NEMA WD 6 and WD 1.
1. Style: Hard use specification grade. Dual USB charging ports rated at a minimum of 3.5A.
2. Device Body: Impact resistant plastic with impact resistant nylon face. Auto grounding strap.
3. Ratings: Match branch circuit and load characteristics. Default rating is 5-20R, 125V, 20A.
4. Wiring: Three (3) pre-stripped 6” wire leads for line, neutral, and ground. Splice to building wire within outlet box.
5. Color: Selected during submittal phase. Provide color chart upon request.

B. USB Duplex Receptacle: Type A & C
1. Manufacturers:
a. Hubbell USB20

b. Eaton
c. Pass & Seymour
d. Leviton

2. Receptacles in all areas as noted in NEC Article 406.

2.05 WALL PLATES

A. Standard Cover Plates:
1. Type 302 stainless steel cover plates. Cover plate style to be confirmed during submittal phase.
2. Basis of Design: Pass & Seymour #SS (Metal), to be confirmed during submittal phase.
3. Provide coverplate for all devices and provide multiple gang plates where required.

B. Jumbo Cover Plates:
1. Type 302 stainless steel oversize cover plates. Cover plate style to be confirmed during submittal phase.
2. Basis of Design: Pass & Seymour #SSO (Metal) to be confirmed during submittal phase.
3. Provide coverplate for all devices and provide multiple gang plates where required.
4. Provide oversize plates on all masonry rough-ins. Verify with architect prior to work being performed.

C. Weatherproof Box & Cover:
1. Basis of Design: Pass & Seymour #WIUC10.
a. Description: Heavy-duty polycarbonate NEMA 3R “While-In-Use” weatherproof box and cover. Installed horizontally.
b. Complies with NEC Article 406 requirements for wet location covers.
c. Provide with plate kits as required.
d. Provide multi-gang or deep cover configurations as required for application.
e. Cover shall be capable of accepting a standard size padlock.
f. Color shall be gray, to be confirmed during submittal phase.
g. Indicated by "WP" on plans.

2.06 FLOOR BOXES AND SERVICE FITTINGS

A. See schedule on drawings.

2.07 EMERGENCY PUSHBUTTON

A. Yellow indoor/outdoor surface mount turn to reset stopper station with red pushbutton assembly, 120/240V rated, 1 NO + 1NC contact, ADA compliant, with clear polycarbonate cover suitable for -40 to 250 degrees Fahrenheit, and stainless steel backplate. Provide engraved nameplate above pushbutton that shall read: EMERGENCY POWER OFF. Provide cover that sounds when cover has been opened to prevent accidental or malicious activation.
1. Manufacturers:
a. STI SS2 2 1PO-EN
b. Engineer approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that outlet and switch boxes are installed at proper height.

B. Verify that wall openings are neatly cut and will be completely covered by wall plates.

C. Verify that floor boxes are adjusted properly.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.02 PREPARATION

A. Provide extension rings as needed to bring outlet and switch boxes flush with finished surface.

B. Clean debris from outlet and switch boxes prior to device installation.

3.03 INSTALLATION

A. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

E. Install receptacles with grounding pole on top.

F. Connect wiring device grounding terminal to outlet box with bonding jumper.

G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

H. Connect wiring devices by wrapping conductor around screw terminal.

I. Use oversize plates for outlets installed in masonry walls.

J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

K. The electrical contractor shall verify floor finish and location before ordering floor devices.

L. The feeding of receptacles downstream of GFI receptacles for protection in lieu of providing multiple GFI receptacles is NOT allowed.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 26 0533 to obtain mounting heights specified.

B. In masonry walls, switches and receptacle heights shall be adjusted as required such that outlets are at nearest mortar joint to specified height.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection, testing, and adjusting in accordance with Section 01 4000.

B. Inspect each wiring device for defects.

C. Operate each wall switch with circuit energized and verify proper operation.

D. Verify that each receptacle device is energized.

E. Test each receptacle device for proper polarity.

F. Test each GFCI receptacle device for proper operation.

3.06 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.07 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

3.08 EXTRA MATERIALS AND LABOR

A. The electrical contractor shall include in their bid an allowance to install an additional five duplex receptacles including an average 50 feet of raceway, associated wiring, back box and labor, and all accessories required to energize each receptacle requested. Receptacle(s) may be added anytime during the construction process as requested by the owner or design team. Any unused devices shall be turned over to the owner at the final acceptance of building.

END OF SECTION

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SECTION 26 28 16
ENCLOSED STARTERS AND SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Safety switches

B. Motor-Rated starters and switches

C. Automatic Controllers

1.02 RELATED REQUIREMENTS

A. Specification Section 26 0529 - Hangers and Supports for Electrical Systems

B. Specification Section 26 0553 - Identification for Electrical Systems

C. Specification Section 26 2813 - Fuses

1.03 REFERENCE STANDARDS

A. NEMA FU 1 - Low Voltage Cartridge Fuses; National Electrical Manufacturers Association

B. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association

C. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association

D. NFPA 70 - National Electrical Code; National Fire Protection Association

E. NECA - Standard of Installation (published by the National Electrical Contractors Association)

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide switch ratings and enclosure dimensions.

C. Project Record Documents: Record actual locations of enclosed switches.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 SAFETY SWITCHES

A. Manufacturers
   1. Square D
   2. ABB
   3. Eaton
   4. Siemens
   5. Engineer approved equal.

B. Heavy duty safety switches shall be used for all motor loads over 1 HP and all non-motor loads 20 amps and greater.
   1. Fusible Switch Assemblies: NEMA KS 1, Type HD enclosed load interrupter knife switch.
      a. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
      b. Handle lockable in OFF position.

c. Fuse clips: Designed to accommodate NEMA FU1, Class R fuses, with rejection clips designed to permit installation of Class R fuses only.
d. Indicated as a disconnect switch with a "F" on the drawings.

2. Nonfusible Switch Assemblies: NEMA KS 1, Type HD enclosed load interrupter knife switch.
   a. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
   b. Handle lockable in OFF position.
3. Enclosures: NEMA KS 1.
   a. Interior Dry Locations: Type 1 .
   b. Exterior Locations: Type 3R.
   c. Enclosures shall be provided with a method of opening the cover without opening the switch.
4. Enclosure shall include a grounding bar.

2.02 MOTOR-RATED STARTERS AND SWITCHES

A. Manufacturers
   1. Square D
   2. ABB
   3. Cutler-Hammer
   4. Siemens
   5. Cooper-Bussmann
   6. Engineer approved equal.

B. Motor-rated starters and switches may be used for all motor loads 1 HP and less and all non-motor loads under 20 amps.
   1. Motor-Rated Switch with Fuseholder
      a. Basis of Design: Cooper-Bussmann "STY".
      b. Description: Motor-rated toggle switch disconnecting means with plug fuseholder.
      c. Fuseholder: Designed to accommodate plug fuses. Provide fuse sized per NEC 430.
      d. For use with single-pole motors only.
   2. Nonfusible Motor-Rated Starter
      a. Basis of Design: Square D "Type F".
      b. Description: Fractional horsepower manual starter with melting alloy type thermal overload relay.
      c. Handle lockable in OFF position.
      d. Current rating: 16A
      e. For use with single-phase motors only.
      f. Provide and install thermal units sized per NEC 430.
   3. Nonfusible Motor-Rated Switch
      a. Basis of Design: Square D "Type K".
      b. Description: Fractional horsepower manual switch with melting alloy type thermal overload relay.
      c. Handle lockable in OFF position.
      d. Current rating: 30A
      e. For use with single or three phase motors.

2.03 AUTOMATIC CONTROLLERS

A. Magnetic Motor Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower.

B. Reversing Controllers: Include electrical interlock and integral time delay transition between FORWARD and REVERSE rotation.

C. Two-Speed Controllers: Include integral time delay transition between FAST and SLOW speeds.

D. Coil Operating Voltage: 120 volts, 60 Hertz.

E. Overload Relay: NEMA ICS; bimetal.

F. Enclosure: NEMA ICS 6, type as required to meet conditions of installation.

G. Auxiliary Contacts: NEMA ICS 2, two each normally open contacts in addition to seal-in contact.

H. Cover Mounted Pilot Devices: NEMA ICS 5, standard duty type.

I. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

J. Pushbuttons: Shrouded type.

K. Indicating Lights: Transformer type.

L. Selector Switches: Hand off/on/auto selector switch type.

M. Relays: NEMA ICS 2.

N. Control Power Transformers: 120 volt secondary in each motor starter. Provide fused secondary, and bond un-fused leg of secondary to enclosure.

O. Electrical contractor shall provide this style motor starter for integrating into controls/BMS. Coordinate with the mechanical contractor.

P. Automatic Controllers shall come with lockable disconnecting means.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install in accordance with manufacturer's instructions.

C. Install plumb and provide in accordance with Specification Section 26 0529 - Hangers and Supports for Electrical Systems.

D. Height to be five foot (5') to operating handle.

E. Install fuses in fusible disconnect switches. Fuses shall not be installed until equipment is ready to be energized.

F. Provide one set of spare fuses of each size and type.

G. Provide adhesive label with white letters on black background for associated equipment.

H. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.02 FIELD QUALITY CONTROL

A. Perform field inspection in accordance with Section 01 4000.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.5.1.2.

END OF SECTION

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SECTION 26 32 13
ENGINE GENERATORS

PART 1 GENERAL

1.01 GENERATOR SHALL BE FULLY INSTALLED, TESTED AND OPERATIONAL PRIOR TO THE PROJECT SUBSTANTIAL COMPLETION DATE. REFER TO THE PROJECT FRONT-END DOCUMENTS FOR THE REQUIRED SUBSTANTIAL COMPLETION DATE.

1.02 SECTION INCLUDES

A. General requirements
B. Materials and parts
C. Diesel-fueled engine
D. Fuel system
E. Unit mounted radiator
F. Generator
G. Power connection
H. Digital control panel
I. Generator connection box
J. Remote annunciator panel
K. Exhaust system
L. Starting system
M. Weatherproof enclosure
N. Vibration isolators
O. IBC and OSHPD seismic certifications
P. Fuel
Q. Outdoor housekeeping pads

1.03 RELATED SECTIONS

A. Specification Section 23 1123 - Natural Gas Piping
B. Specification Section 23 1124 - Fuel Oil Piping System
C. Specification Section 23 5100 - Breechings, Chimneys and Stacks
D. Specification Section 26 3600 - Transfer Switch

1.04 REFERENCE STANDARDS

A. The generator covered by these specifications shall be designed, tested, rated, assembled and installed in strict accordance with all applicable standards of ANSI, NEC, ISO, UL, IEEE, IEC and NEMA, as well as the following:
   1. NFPA 70: National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
   2. NFPA 110: Emergency and Standby Power Systems. The generator set shall meet all requirements for this standard and prototype tests required shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement.
   3. UL 508A: The entire control system of the generator set shall be UL 508A Listed and labeled.
   4. UL 2200: The entire package generator set shall be UL 2200 Listed
   5. ISO 9001: The generator set must be built in a factory that is ISO 9001 certified
   6. United States Environmental Protection Agency NSPS standards, including State and Local authorities

7. International Mechanical Code (IMC)
8. NFPA 37: Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
9. NFPA 30: Flammable and Combustible Liquids Code
10. NFPA 54: National Fuel Gas Code
11. NFPA 99: Essential Electrical Systems for Health Care Facilities
12. ISO 8528-1:2005: Reciprocating internal combustion engine driven alternating current generating sets.

1.05 WORK INCLUDED

A. Installation: The work includes supplying and installing a complete integrated generator system as a stand-by alternate source of power to the electrical loads indicated in the plans in the event of a utility outage. The system consists of a diesel generator set with related component accessories.

B. Fuel System: Provide a complete fuel system.
   1. Diesel fuel vents shall be extended to 12' above level of occupancy or maintenance.

C. Permits:
   1. Contractor shall be responsible for all air construction permits related to the generator.
   2. Air construction permits shall be filed with the DNR Air Quality Bureau prior to installation.

D. Air Quality Dispersion Modeling
   1. Include in the bid all costs to perform an air quality dispersion model to meet Iowa DNR requirements.
   2. This contractor is to include this proposal and scope of work in bid. Work may be performed by another pre-approved subcontractor if the contractor prefers.

1.06 CODES AND REGULATIONS

A. Comply with all applicable requirements of NFPA and IFC.

B. The equipment supplied and installed shall meet the requirements of the current Edition of the NEC and all applicable local codes and regulations. All equipment shall be of new and current production by a manufacturer who has minimum 50 years of experience building this type of equipment.

C. The engine will utilize in-cylinder combustion technology, as required, to meet the applicable EPA NSPS rule for stationary reciprocating compression ignition engines. Additionally, the engine shall comply with State Emission Regulations at the time of installation/commissioning. Actual engine emission values must be in compliance with applicable EPA emission standards per ISO 8178 - D2. Emissions cycle at specified ekW /bHP rating. Utilization of the "Transition Program for Equipment Manufacturers" (also known as "Flex Credits") to achieve EPA certification is not acceptable. The in-cylinder engine technology must not permit unfiltered exhaust gas to be introduced into the combustion cylinder.

D. Emissions requirements/certifications of this package:
   1. EPA Tier 2 Emergency back up only units with 15 or fewer hours per year at non-major HAP source sites.

1.07 AUTHORIZED SUPPLIERS

A. Catepillar - Basis of Design

B. Kohler

C. Cummins/Onan

D. MTU

E. Generac

F. Engineer approved equal.

1.08 GENERATOR SET MANUFACTURER

A. To qualify as a manufacturer, the engine must be the principal item manufactured and the completed engine generator set shall be supplied by that manufacturer's authorized distributor only.

1.09 AUTHORIZED DISTRIBUTOR

A. The equipment supplier shall be the local authorized distributor for the product supplied.

1.10 SUBSTITUTION

A. Proposed deviations from the specifications shall be treated as follows:
   1. Requests for substitutions shall be made in writing a minimum of ten (10) days prior to bid date. Manufacturers technical submittal shall accompany each request and authorized acceptance shall be by written addenda only. The manufacturers technical submittal shall at a minimum include the following:
      a. Factory published specification sheet(s) indicating standard and optional accessories, ratings, etc. Must include copy of UL 2200 certification.
      b. Dimensional elevation and layout drawings of the generator set, enclosure, transfer switchgear and related accessories.
      c. Engine mechanical performance data at varying loads up to full load, including heat rejection, exhaust gas flows, combustion air and ventilation air flows, noise data, fuel consumption, etc.
      d. Generator electrical performance data including temperature and insulation data, cooling requirements, excitation ratings, voltage regulation, voltage regulator, efficiencies, waveform distortion and telephone influence factor.
      e. Generator resistances, reactance and time constants.
      f. Generator current decrement curve.
      g. Generator motor starting capability curve expressed in skVA and percentage voltage drop. Must indicate skVA at 30% instantaneous voltage drop. References to sustained voltage dip are unacceptable and do not meet this specification.
      h. Manufacturer's written warranty statements.
      i. Certified torsional analysis.
      j. Certified exhaust emissions data.
      k. Complete a detailed list of any exceptions or deviations from these specifications referenced by page and paragraph number.

B. Substitution Responsibility:
   1. The emergency power system has been designed to the specified manufacturer's electrical and physical characteristics. The equipment physical sizing, spacing, controls, electrical wiring, ventilation equipment, fuel and exhaust components have all been designed around the basis of design equipment. Other engineer approved manufacturers may be utilized, as long as the contractor has verified 100% compliance with these specifications and plans.
   2. Should any substitutions be made, the contractor shall bear complete responsibility for the installation, coordination and operation of the system as well as any engineering and redesign costs, which may result from such substitutions.

1.11 SUBMITTALS

A. Engine-generator submittals shall include the following information:
   1. Factory published specification sheet indicating standard and optional accessories, ratings, etc. Must include copy of UL 2200 certification.
   2. Manufacturer's catalog cut sheets of all auxiliary components such as fuel tank, enclosure, isolators, battery charger, silencer, exhaust flex, main circuit breaker, jacket water heater, battery heater, etc.
   3. Dimensional elevation and layout drawings of the generator set, (including: exhaust and fuel connections), enclosure, transfer switchgear and related accessories.

4. Engine mechanical performance data at varying loads up to full load, including heat rejection, exhaust gas flows, combustion air and ventilation air flows, noise data, fuel consumption, etc.
5. Generator electrical performance data including temperature and insulation data, cooling requirements, excitation ratings, voltage regulation, voltage regulator, efficiencies, waveform distortion and telephone influence factor.
6. Generator resistances, reactance and time constants.
7. Generator current decrement curve.
8. Generator motor starting capability expressed in skVA and percentage voltage drop. References to sustained voltage dip are unacceptable and do not meet this specification.
9. Wiring Diagrams: Battery heater and jacket water heater connection diagram. Battery heater connection diagram.
10. Control panel schematics and customer connection diagrams, including annunciator panels.
11. Oil sampling analysis, laboratory location, and information.
12. Manufacturer's written warranty.
13. Certified exhaust emissions data.
14. Certified torsional analysis.
15. Maintenance Data: Include instructions for routine maintenance requirements, service manuals for engine and day tank, oil sampling analysis for engine wear, and emergency maintenance procedures.
16. Manufacturer's written warranty.

1.12 WARRANTY

A. Five Year Standard Warranty

B. The manufacturer's standard warranty shall in no event be for a period of less than two (2) years from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendable. Submittals received without written warranties as specified will be rejected in their entirety.

C. Warranty Administration: The manufacturer's authorized dealer shall be capable of administering the manufacturer and dealers warranty for all components supplied by the selling dealer.

1.13 PARTS AND SERVICE QUALIFICATIONS

A. Service Facility: The engine-generator supplier shall maintain 24-hour parts and service capability. The distributor shall have sufficient parts inventory to maintain over the counter availability of at least 90% of any required parts and 100% parts availability within 48 hours from the time an order is entered with the distributor.

B. Service Personnel: The dealer shall maintain qualified; factory trained service personnel that can respond to an emergency call and be on site within 4 hours of notification.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Genset Requirements: The generator set shall be standby -rated at 750 kW, 937.5 kVA, 1800 rpm, 0.8 power factor, 480/277V 3-phase, 60 hertz, including radiator fan and all parasitic loads.

2.02 MATERIALS AND PARTS

A. All materials and parts comprising the unit shall be new and unused.

2.03 DIESEL-FUELED ENGINE

A. Manufacturers:
1. Caterpillar - Basis of Design
2. Detroit Diesel

3. John Deere
4. Volvo
5. Rehlko (Formerly Kohler)
6. Generac
7. MTU
8. Engineer approved equal.

B. The engine shall be water-cooled, four-cycle compression ignition diesel with a minimum **1106** cubic inch displacement and **900** bhp. It shall meet specifications when operating on #2 fuel oil 60/40 winter blend for exterior applications in cold climate areas. The engine shall be equipped with primary and secondary fuel filters, fuel/water separator, lube oil filters, and intake air filters, lube oil cooler, fuel transfer pump, fuel priming pump, service meter, and gear-driven water pump.

C. The engine shall be equipped with in-cylinder combustion technology that allows engine to meet all US EPA Stationary Emission Standards. The in-cylinder technology must not permit unfiltered exhaust gas to be introduced into the combustion cylinder.

D. Governor (Electronic)
1. The engine governor shall be an electronic speed control with actuator. Speed droop shall be "0" (isochronous) from no load to full rated load. Steady state frequency regulation shall be +/- 0.25%. Speed shall be sensed by a magnetic pickup off the engine flywheel ring gear. A provision for remote speed adjustment shall be included. In the event of a DC power loss, the forward acting actuator will move to the minimum fuel position.

E. Block Design
1. The complete engine block shall be machined from one casting. Designs incorporating multiple blocks bolted together are not acceptable.

F. Lubrication System
1. The engine shall utilize a gear-type, positive displacement, full pressure lubricating oil pump and water-cooled lube oil cooler. Pistons shall be spray-cooled. Provide oil filters, oil pressure gauge, dip stick and oil drain with drain valve.

G. Motor Starting
1. Provide motor starting capability of minimum 1712 skVA at 30% instantaneous voltage dip as defined by NEMA MG-1 for 480/277V systems and 1325 skVA at 30% instantaneous voltage dip as defined by NEMA MG-1. Sustained voltage dip performance data is not acceptable and does not show compliance with this specification.

2.04 FUEL SYSTEM

A. The work required under this section shall conform to all manufacturing and code requirements.

B. Fuel Tank Vent Piping: Generator vendor shall be responsible for providing fuel tank vent piping for a fuel tank venting system that meets the applicable requirements of the NFPA, IFC and local code requirements.

C. Fuel Filter
1. Fuel filter and serviceable fuel system components shall be located to prevent fuel from spilling onto genset batteries. In addition to the standard fuel filters provided by the manufacturer, engine shall be equipped with a primary fuel filter/water separator in the fuel inlet line to the engine or before the day tank, if provided.

D. Fuel Piping
1. All fuel piping shall be black iron or flexible fuel hose rated for this service. No galvanized piping will be permitted.

E. Fuel Line rating
1. Flexible fuel lines rated 300 deg F and 100 PSI (149 deg C and 689 kPA).

F. Dual Wall Gallon Fuel Tank Base: A UL-142 Listed dual wall generator base tank sized to provide minimum 24 hours of usable tank capacity at 100% of the Standby kW rating shall be

provided with generator set. Supply piping connections for fuel supply/return lines to engine, normal and emergency vent, include local fuel fill, containment drain connection, and fuel level gauge. The following accessories shall be provided: low fuel level alarm, rupture basin alarm. The fuel tank shall have additional capacity at top and bottom to prevent spillage as fuel heat and sludge pickup, and shall have internal baffles to reduce heat build-up.

2.05 UNIT MOUNTED RADIATOR

A. The generator set shall be equipped with a rail-mounted, engine-driven radiator with blower fan and all accessories. Radiator shall be equipped with radiator duct flange to facilitate flexible connection to air ducting. The cooling system shall be sized to operate at full load Standby kW conditions and 122 deg F ambient air temperature without de-rating the unit and 50/50 antifreeze mixture. The generator set supplier is responsible for providing a properly sized cooling system based on the enclosure static pressure restriction. The cooling capability must be certified by the engine-generator manufacturer on factory specification sheets for the submittal.

2.06 GENERATOR

A. The synchronous three-phase generator shall be a single bearing, self-ventilated, drip-proof design in accordance with NEMA MG 1 and directly connected to the engine flywheel housing with a flex coupling. The generator shall meet performance class G3 of IEC.

B. Windings
   1. All winding insulation materials shall be Class H in accordance with IEC and IEEE standards. No materials shall be used which support fungus growth and shall be impervious to oil, dirt and fumes encountered in diesel and natural gas engine operating environments.
   2. Alternator pitch shall be 0.667 or optimum winding pitch. The rotor shall, as a minimum, be capable of surviving the effects of 125% over speed for 2 minutes according to NEMA MG1-33. The permissible residual unbalance permitted in the rotor, measured at maximum service speed (nominal + 25% over speed), must not exceed the limits as described in ISO 1940/1 G2.5.

C. Insulation
   1. The insulation material for the stator shall meet NEMA MG 1 standards for Class H insulation and be vacuum impregnated and fungus resistant. Temperature rise of the rotor and stator shall not exceed NEMA Class H limits. The excitation system shall be of brushless construction. The generator insulation system shall be UL 1446 Recognized.
   2. Temp Rating Class: 105 deg C (Continuous)
   3. Separately Derived Excitation: The brushless exciter shall be independent of main stator windings (either permanent magnet or auxiliary windings-AREP) and shall consist of a three-phase armature and a three-phase full wave bridge rectifier mounted on the rotor shaft. Surge suppressors shall be included to protect the diodes from voltage spikes. Generator shall have the ability to sustain short circuit current of 300% of rated current to allow protective devices to operate and shall improve the immunity of the voltage regulator to non-linear distorting loads.(PMG)
   4. Voltage Regulator: The automatic digital voltage regulator (DVR) shall maintain generator output voltage within +/- 0.25% for any constant load between no load and full load. The regulator shall be microprocessor based with fully programmable operating and protection characteristics. The regulator shall be capable of sensing true RMS in three phases of alternator output voltage or operating in single phase sensing mode. Harmonic tolerance shall be 0.5% voltage regulation with 40% THD. Digital voltage regulator shall contain minimum of ten programmable generator protective relay functions. Regulator must include remote communication interface via CAN 2.0B. The voltage regulator shall be UL 508 Listed.

2.07 POWER CONNECTION

A. The circuit breaker/power terminal strips shall be mounted on the generator.

B. Generator Ingress Protection: The degree of protection against the entry of solid materials and liquids into the generator enclosure shall be minimum of 12 mm and a spray angle of up to 60 deg as defined by IP23. This rating must be stated on generator specification sheet.

C. Reconnection of Leads: Three phase generators shall utilize a 12 lead design which allows reconnection at site for voltage output other than that specified. It is understood that any reconnection may require a change in circuit breaker to provide protection for the change in amperage.

D. Circuit Breaker: Provide generator-mounted circuit breaker(s), molded case, as indicated on the plans, NEMA 1/IP22. Breaker shall be Schneider Electric or equal and utilize a solid state trip unit electronic adjustable trip unit. The breaker shall be UL Listed and shunt trip option shall be provided connected to engine/generator safety shutdowns. Breaker shall be housed in an extension terminal box which is isolated from vibrations induced by the generator set. Mechanical type lugs, sized for the circuit breaker feeders shown on drawing, shall be supplied on the load side of breaker.

2.08 DIGITAL CONTROL PANEL

A. Provide a package mounted digital control panel for complete control and monitoring of the engine and generator set functions. Panel shall have adjustable contrast and back light with auto power off. Panel shall include automatic start/stop operation; adjustable cycle cranking, digital AC metering (1.0% true rms accuracy) with phase selector switch, digital engine monitoring, shutdown sensors and alarms with horn and reset, adjustable cool down timer and emergency stop push-button. Panel shall incorporate self-diagnostics capabilities and fault logging. Control shall be equipped with standard communication interface compatible with MODBUS protocol via RS-485. All remote annunciators shall communicate on industry standard CAN2 data link. Critical components shall be environmentally sealed to protect against failure from moisture and dirt. Components shall be housed in a NEMA 1/IP22 enclosure. Control panel shall be UL 508A Listed.

B. Digital read outs
   1. Provide the Following Digital Readouts:
      a. Engine oil pressure.
      b. Coolant temperature.
      c. Engine RPM
      d. Battery system DC volts.
      e. Engine running hours.
      f. Generator AC volts (L-L and L-N).
      g. Generator AC amps (per phase and average).
      h. Generator frequency.
      i. kW (total and per phase).
      j. kVA (total and per phase).
      k. kVAr (total and per phase).
      l. Power Factor (overall and per phase).
      m. kW-hrs.
      n. kVAr-hrs.
      o. Crank attempt counter.
      p. Start counter.

C. Provide a programmable local alarm annunciator panel mounted in digital control panel to monitor alarm conditions and status indications. Alarm panel shall consist of 16 pairs of colored LED's that can be programmed to annunciate system status, warning, or shutdown indication.(Green, Yellow, Red) Annunciator panel shall be designed as part of the J1939 communication network, accessible for remote monitoring and programming and shall be configurable to provide all indications for either NFPA-99 or NFPA-110 requirements. An additional pair of status lights shall be included to provide status indication of J1939 data link connection. Include alarm horn with lamp test and alarm acknowledgement pushbuttons.

D. Programmable Protective Functions:
   1. Provide programmable protective relay functions inside the control Panel to Include the following:
      a. Under voltage.
      b. Over voltage.
      c. Over frequency.
      d. Under frequency.
      e. Reverse power.
      f. Overcurrent.
      g. Four spare fault channels.
      h. Fault log with descriptions of condition.

E. Utilize stranded wiring for generator control connections.

2.09 GENERATOR CONNECTION BOX

A. Generator tap box shall consist of cam-style male connectors and grounding terminals, all housed within a pad-lockable enclosure.

B. Generator tap box enclosure shall be Type 3R, constructed of continuous seam-welded, powder coated galvanized steel. The main access shall be through a hinged door that extends the full height of the enclosure. Access for portable generator cables with female cam-style plugs shall be via a drawn flange cable entry openings in the bottom of the enclosure for wall mount units, or hinged lower door for pad mount units. A hinged flap door shall be provided to cover the cable openings when cables are not connected; the hinged flap door shall allow cable entry only after the main access door has been opened. Enclosure shall be a powder coated after fabrication; color shall be wrinkle gray RAL 7035.

C. Cam-style male connectors (inlets) shall be UL Listed single-pole separable type and rated 100-4000 amps at 600VAC. Cam-style male connectors shall be color coded. Cam-style male connectors shall be provided for each phase and for ground, and shall also be provided for neutral if required. The ground cam-style male connectors shall be bonded to the enclosure, and a ground lug shall be provided for connection of the facility ground conductor. None of the cam-style male connectors shall be accessible unless the main access door is open.

2.10 REMOTE ANNUNCIATOR PANEL

A. Provide one programmable remote annunciator panel(s) meeting the requirements of NFPA-110, type 10, level 1, to monitor alarm conditions and status indications. Annunciator shall consist of 16 pairs of colored LED's that can be programmed to annunciate system status, warning, or shutdown indication.(Green, Yellow, Red) annunciator panel shall be designed as part of the J1939 communication network, accessible for remote monitoring and programming and shall be configurable to provide all indications for either NFPA-99 or NFPA-110 requirements. An additional pair of status lights shall be included to provide status indication of J1939 data link connection. Include alarm horn with lamp test and alarm acknowledgement pushbuttons.

B. Remote annunciator shall be located as indicated on the plans.

2.11 EXHAUST SYSTEM

A. Silencer: A properly sized critical rated silencer, companion flanges, flexible stainless steel exhaust fitting, nuts/bolts/gasket sets, and rain cap shall be furnished by the generator set supplier. The silencer shall be mounted so that its weight is not supported by the engine nor will exhaust system growth due to thermal expansion be imposed on the engine. Exhaust pipe size shall be sufficient to ensure that exhaust back pressure does not exceed the maximum limitations specified by the engine manufacturer.

B. Exhaust System: The silencer and all indoor exhaust piping shall be "lagged" by the contractor to maintain a surface temperature not to exceed 150 deg F (66 deg C). The insulation shall be installed so that it does not interfere with the functioning of the flexible exhaust fitting(s). Generator supplier must provide insulated exhaust roof/wall thimble for use with combustible

walls. Thimble to be constructed of heavy steel construction with high temperature insulation and must meet requirements of NFPA 37 and 110. Standard finish shall be high heat black enamel.

2.12 STARTING SYSTEM

A. Electric Starting System: A 12/24 VDC electric starting system with positive engagement shall be furnished. The motor voltage shall be as recommended by the engine manufacturer.

B. Jacket Water Heater: A generator set mounted thermal circulation type water heater. The heater shall be sized by the manufacturer to maintain jacket water temperature at 90 deg F (32 deg C), and shall be rated for the voltage indicated on the plans.

C. Batteries: A lead-acid storage battery set of the heavy-duty starting type shall be provided. Battery voltage shall be compatible with the starting system. The battery set shall be sized with enough cold cranking amp capacity to provide for three 15 second crank periods in the minimum ambient temperature. Necessary cables and clamps shall be provided. Batteries shall be warranted by the engine generator manufacturer. Batteries shall be installed in trays provided by the generator manufacturer.

D. Battery Charger: A current limiting UL listed battery charger shall be furnished to automatically recharge batteries. Charger shall have automatic float/equalize feature. It shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressor, DC ammeter, DC voltmeter, and fused AC input. AC input voltage shall be 120 volt, single phase, 60 Hz. Charger shall have LED annunciation for low DC volts, rectifier failure, loss of AC power, high DC volts. Amperage output shall be no less than that required to charge battery set from discharged state to full charge within 24 hours. Battery charger shall be in NEMA 1 enclosure. For outdoor genset, the battery charger shall be mounted inside the genset enclosure, wired to common point AC station power distribution, and DC side shall be wired directly to starter.

2.13 WEATHERPROOF ENCLOSURE

A. Construction: The weather proof enclosure is rated to a wind load of 120 MPH and 50 lbs per sq ft roof load. Heavy-duty formed panels, solid construction with interchangeable modular construction to allow design flexibility. Preassembled package offering corrosion resistant, dent resilient structure, 14 gauge aluminum mounting directly to the generator set skid. The roof of the enclosure shall meet or exceed the minimum gauge requirements specified but, in addition, shall be strengthened in such a manner as to support the largest commercially available exhaust silencer recommended by the engine manufacturer for this application. All exterior components of the enclosure shall be assembled utilizing stainless steel bolts, nuts and lock washers. All seams shall be sealed to prevent leaks. Provide a snow package rated to -20 degree C (-4 degree F) with rodent guards.

B. Service Access: Multi-Personnel hinged and removable doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill, and battery. Door hold backs provide positive door positioning during wind gusts. Recessed and lockable door handles minimize potential damage. Rubber sealed to prevent water infiltration and minimize noise.

C. Cooling: Cooling/Combustion air intake louvers with weather protective designs using fixed air inlet louvers. Sized for maximum cooling airflow. Cooling air discharge with weather protective design featuring vertical air discharge. Exhausts air through a punched air outlet grille. Radiator ducted to enclosure air outlet to prevent air recirculation. Internal exhaust silencer.

D. Sound Attenuation: Includes all the weather enclosure features with the addition of acoustic insulation material. Internal exhaust silencer offering maximum component life and operator safety. Level 2 uses dual silencers connected in series and acoustic insulation UL 94 HF1 listed for flame resistance.

E. Paint: The enclosure shall be powder coat painted with a minimum of two coats of rust-inhibiting primer and finished with a minimum of two coats of polyurethane. Final color of finish coat will be selected at shop drawing review. Furnish a sample to the owner.

F. Wiring and Connectors: All wiring within the enclosure shall be in conduits made from rigid metal, EMT, or liquid-tight material specifically manufactured for electrical use. All connections at the generator set shall be flexible, and all shall be provided and installed by the enclosure manufacturer. All conduits, wire, cables, interconnections, etc., entering or exiting the generator enclosure shall be furnished and installed by the installing contractor. All wiring shall be in conduits sized in accordance with the NEC. All power and control wiring shall be installed for a complete and operating system.

G. Subbase Fuel Tank: Textured epoxy-based rubberized coating that creates an ultra-thick barrier between the tank and harsh environmental conditions. UL listed secondary containment tank meeting UL 142 requirements. Complies with NFPA 30 & 37. Integral external lift lugs enables crane with spreader-bar lifting of the complete package (empty tank, mounted generator set, and enclosure) to ensure safety. Emergency pressure relief vents ensure adequate venting of inner and outer tank under extreme pressure. Fuel level sensor and leak detection switch for annunciated warning through controller. Consult with manufacturer for stair and platform options.

H. Weight: The weight of the entire unit consisting of generator set, enclosure and other specified items including all liquids (i.e., fuel oil and cooling solutions) shall be calculated by the enclosure manufacturer. The base of the unit shall be designed and manufactured as a heavy duty, structural steel construction with lifting provisions to support the calculated weight. Details of the base construction shall be included with the drawings submitted for approval as well as all dealer weight calculations supported by manufacturer's data.

I. Thermo Insulation: The enclosure is to be thermo insulated with gasketed doors. Insulation material is to be fiberglass held in place with a galvanized perforated metal liner.

J. Load Center: The enclosure shall be equipped with a 100 amp 208/120-volt three phase load center for the battery charger, jacket water heater(s), lighting, receptacles, etc., as specified and as shown on the drawings. The load center shall be mounted within the enclosure and allow for a single entry point for commercial power supply conduit and wiring by the installing contractor. The placement of this load center shall be shown on the submittal drawings. All internal conduit and wiring to the ancillary equipment shall be supplied within the package and shall be pre-wired by the enclosure manufacturer in accordance with all governing codes pursuant to this application.

K. DC Light Package: Prewired (quantity 2), internal DC light package offering an economical alternative light source within the enclosure when the AC power is not available. Battery drain limited with fuse protection and controlled through a 0-60 minute, spring-wound, no-hold timer.

L. Block Heater: Generator shall be equipped with single phase AC powered space heaters to minimize condensation while the generator is idle. The heaters shall be capable of factory mounted in the assembled generator. An automatic disconnect shall be provided to remove electrical power upon engine start up

M. Coolant Heater: Engine-mounted thermostatically controlled coolant heater to aid in quick starting. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 104°F in a 40°F ambient, in compliance with NFPA 110 requirements. Heater shall be rated single-phase, 120 volts, 2,500 watts and be disconnected whenever the engine starts. Heater shall be UL 499 listed and labeled. The coolant heater(s) shall include provisions to isolate the heater for replacement of the heater element without draining the coolant from the generator set. The contractor shall provide proper circuit from normal power source.

N. Battery Charger: Mounting and prewiring of DC output and AC input. Battery charger located inside of the enclosure and accessible through an access door.

2.14 VIBRATION ISOLATORS

A. Rubber type linear vibration isolators shall be installed between the engine-generator and its base frame. The isolators shall be resistant to heat and age, and impervious to oil, water, antifreeze, diesel fuel, and cleaning compounds.

2.15 IBC AND OSHPD SEISMIC CERTIFICATIONS

A. Genset, including components necessary for continued operation, shall have IBC and OSHPD seismic certifications. The level of certification shall meet or exceed that required for the seismic zone at the installation location.

2.16 FUEL

A. Contractor is responsible for providing all fuel for the generator for all required testing and startup. Fuel tank(s) shall be filled to the maximum allowable level at the completion of all required testing and startup. Fuel tank(s) must be filled prior to the generator system being considered substantially complete.

2.17 OUTDOOR HOUSEKEEPING PADS

A. For projects that include a generator, the generator pad shall be 4" nominal thick concrete for non walk-in type generators and 6" nominal thick concrete for walk-in type generators. The concrete pad shall extend 6" beyond the outside of the enclosure/fuel tank. All edges shall be rounded with a 1/2 inch radius. The contractor shall notify the design team if the manufacturer's installation instructions state otherwise.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install equipment in accordance with manufacturer's recommendations, the project drawings and specifications, and all applicable codes.

B. Generator Control Wiring: Control conductors installed between the transfer equipment and the emergency generator shall be kept entirely independent of all other wiring and shall meet the conditions of 700.10(D)(1). The integrity of the generator remote start circuit(s) shall be monitored for broken, disconnected, or shorted wires. Loss of integrity shall start the generator(s).

3.02 START UP AND TESTING

A. Coordinate all start-up and testing activities with the engineer and owner.

B. After installation is complete and normal power is available, the manufacturer's local dealer shall perform the following:
   1. Verify that the equipment is installed properly.
   2. Check all auxiliary devices for proper operation, including battery charger, jacket water heater(s), generator space heater, remote annunciator, etc.
   3. Test all alarms and safety shutdown devices for proper operation and annunciation.
   4. Check all fluid levels.
   5. Start engine and check for exhaust, oil, fuel leaks, vibrations, etc.
   6. Verify proper voltage and phase rotation at the transfer switch before connecting to the load.
   7. Connect the generator to building load and verify that the generator will start and run all designated loads in the plant.

3.03 MANUALS

A. Provide two sets of operation and maintenance manuals covering the generator, switchgear, and auxiliary components. Include parts manuals, final as-built wiring interconnect diagrams and recommended preventative maintenance schedules.

3.04 TRAINING

A. On-Site Training: Provide one day of on-site training to instruct the owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts manuals, and emergency service procedures.

END OF SECTION

SECTION 26 36 00
TRANSFER SWITCH

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open transition automatic transfer switch

B. Bypass-isolation switch

C. Service conditions

D. Product options and features

E. Automatic sequence of operation

F. Enclosure

G. Ratings

1.02 RELATED SECTIONS

A. Specification Section 26 0553 - Identification for Electrical Systems

B. Specification Section 26 3213 - Engine Generators

1.03 REFERENCES

A. NEMA ICS 1 - General Standards for Industrial Control and Systems

B. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies

C. NEMA ICS 6 - Enclosures for Industrial Controls and Systems

D. NEMA ICS 10 - AC Transfer Switch Equipment

E. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association)

F. NFPA 70 - National Electrical Code

G. NFPA 99 - Essential Electrical Systems for Health Care Facilities

H. NFPA 110 - Emergency and Standby Power Systems

I. UL 508 - Industrial Control Equipment

J. UL 1008 - Standard for Transfer Switch Equipment

1.04 SUBMITTALS

A. Product Data: Provide catalog sheets showing voltage, switch size, ratings and size of switching and over current protective devices, operating logic, short circuit ratings, dimensions, and enclosure details.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Maintenance Data: Routine preventative maintenance and lubrication schedule. List special tools, maintenance materials, and replacement parts.

D. Manufacturer's written warranty.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience and with service facilities within 100 miles of project.

C. Supplier Qualifications: Authorized distributor of specified manufacturer with minimum three years experience.

D. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.06 MAINTENANCE SERVICE

A. Provide service and maintenance of transfer switches for one year from Date of Substantial Completion.

1.07 WARRANTY

A. One year standard warranty.

B. The manufacturer's standard warranty in no event be for a period of less than one (1) year from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables. Submittals rece3ived without written warranties as specified will be rejected in their entirety.

C. Warranty Administration: The manufacturer's authorized dealer shall be capable of administering the manufacturer and dealers warranty for all components supplied by the selling dealer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Asco

B. Kohler

C. Cummins

D. Engineer approved equal.

2.02 OPEN TRANSITION AUTOMATIC TRANSFER SWITCH

A. Description: NEMA ICS 2, open transition automatic transfer switch suitable for use as service equipment.

B. Configuration: Electrically operated, mechanically held transfer switch.
   1. Transfer switch shall be electrically operated and mechanically held. Main operators which include overcurrent disconnect devices, linear motors, or gears shall not be acceptable.
   2. Each open transition transfer switch shall consist of a power transfer switch mechanism and a microprocessor controller to provide automatic operation.

2.03 BYPASS ISOLATION SWITCH

A. A two-way bypass-isolation switch shall provide manual bypass of the load to either source and permit isolation of the automatic transfer switch from all source and load power conductors regardless of the status of the automatic transfer switch. All main contacts shall be manually driven. The bypass-isolation switch shall permit simple operation by one person through the movement of a maximum of two handles.

B. The entire system shall consist of two elements: the automatic transfer switch and the bypass-isolation switch furnished completely factory interconnected and tested.

C. Bypass to the load-carrying source shall be accomplished with no interruption of power to the load (make-before-break contacts). Designs which disconnect the load when bypassing are not acceptable. The bypass handle shall have three operating modes: "BYPASS TO NORMAL", "AUTOMATIC", and "BYPASS TO EMERGENCY". The operating speed of the bypass contacts shall be the same as the associated transfer switch and shall be independent of the speed at which the manual handle is operated.

D. Isolation shall provide three operating modes: "CLOSED", "TEST", and "OPEN". The "test" mode shall permit testing of the entire emergence power system, including the automatic transfer switches with no interruption of power to the load. The "open" mode shall completely isolate the automatic transfer switch from all source and load power conductors. When in the "open" mode, it shall be possible to completely withdraw the automatic transfer switch for

inspection or maintenance to conform to code requirements without removal of any power conductors or by the use of tools.

E. Bypass Switch Ratings: Match automatic transfer switch for electrical ratings.

2.04 SERVICE CONDITIONS

A. Service Conditions: NEMA ICS 1.

B. Temperature: 80 deg F.

C. Altitude: 1,000 feet.

2.05 PRODUCT OPTIONS AND FEATURES

A. Indicating Lights: Mount in cover of enclosure to indicate NORMAL SOURCE AVAILABLE, ALTERNATE SOURCE AVAILABLE, SWITCH POSITION, NORMAL BYPASS, ALTERNATE SOURCE BYPASS.

B. Test Switch: Mount in cover of enclosure to simulate failure of normal source.

C. Return to Normal Switch: Mount in cover of enclosure to initiate manual transfer from alternate source to normal source.

D. Transfer Switch Auxiliary Contacts: One normally open, one normally closed. Control wiring shall be continuously monitored per NEC.

E. Normal Source Monitor: Monitor each line of normal source voltage and frequency; initiate transfer when voltage drops below 85% or frequency varies more than 3% from rated nominal value.

F. Alternate Source Monitor: Monitor alternate source voltage and frequency; inhibit transfer when voltage is below 85% each line of or frequency varies more than 3% from rated nominal value.

G. Switched Neutral: Overlapping contacts.

H. Transfer Switch Accessory, Asco #7ES: Engine Start Monitoring.

I. Generator Accessory, Asco #5101-Gen Kit: Engine Start Monitoring.

J. PM-8000 Meter integral to the automatic transfer switch.

2.06 AUTOMATIC SEQUENCE OF OPERATION

A. Initiate Time Delay to Start Alternate Source Engine Generator: Upon initiation by normal source monitor.

B. Time Delay To Start Alternate Source Engine Generator: 0 to 6 seconds, adjustable.

C. Initiate Transfer Load to Alternate Source: Upon initiation by normal source monitor and permission by alternate source monitor.

D. Time Delay Before Transfer to Alternate Power Source: 0 to 5 minutes, adjustable.

E. Initiate Retransfer Load to Normal Source: Upon permission by normal source monitor.

F. Time Delay Before Transfer to Normal Power: 0 to 60 minutes, adjustable; bypass time delay in event of alternate source failure.

G. Time Delay Before Engine Shut Down: 0 to 60 minutes, adjustable, of unloaded operation.

H. Engine Exerciser: Start engine every 30 days; run for 30 minutes before shutting down. Bypass exerciser control if normal source fails during exercising period.

I. Alternate System Exerciser: Transfer load to alternate source during engine exercising period.

J. Program Transition: 0-60 sec.

K. 10 amp, 12 VDC charger.

2.07 ENCLOSURE

A. Enclosure: ICS 10, type #1.

B. Finish: Verify color with owner.

2.08 RATINGS

A. Voltage: 480 volt, 3-phase, four-wire, 60 Hz.

B. Switched Poles: Four

C. Load In Rush Rating: Combination tungsten lamp, electric discharge lamp load or combination of motor loads.

D. Continuous Rating: As indicated on the drawings.

E. Interrupting Capacity: As indicated on the drawings.

F. Withstanding Current Rating: Following RMS symmetrical amperes when used with molded case circuit breakers:

AMPS 100-400	AMPS 22,000
AMPS 600-800	AMPS 65,000
AMPS 1000-1200	AMPS 65,000
AMPS 1600-4000	AMPS 65,000

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surface is suitable for transfer switch installation.

3.02 PREPARATION

A. Provide housekeeping pads.

3.03 INSTALLATION

A. Provide engraved plastic nameplates.

B. Provide wiring for Engine Start Monitoring from the new ATS to the Generator feeding this ATS per manufacturer's instructions.

C. Provide communication wiring from the PM-8000 meter to the existing Power Monitoring Equipment (PME).

3.04 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.22.3.

3.05 MANUFACTURER'S FIELD SERVICES

A. Check out transfer switch connections and operations and place in service.

3.06 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation of transfer switch in bypass, normal, and emergency modes.

B. Provide testing and confirmation by owner that ATS communication system is operating to their satisfaction.

END OF SECTION

SECTION 26 41 13
LIGHTNING PROTECTION SYSTEM

PART 1 GENERAL

1.01 SCOPE

A. Owner has an existing lightning protection system. Contractor shall reinstall and/or replace any existing defective Lightning Protection System components as required to provide a complete and fully operational lightning protection system.

B. Furnish all labor, materials, and items of service for a complete and unobtrusive lightning protection system approved by the design team, and in strict accordance with the specifications and contract drawings. System shall be as indicated on the drawings and as specified herein. If any departure from the contract drawings covered below is deemed necessary by the contractor, details of such departures and reasons therefore shall be submitted to the design team for approval. No such departures shall be made without the prior written approval of the design team.

C. All installers shall have 5 years experience with installing UL master labeled and LPI certified systems or of equivalent qualification, as accepted in writing by the engineer of record. A UL/LPI certified installer shall be on the project site at all times during installation of the systems and shall supervise all of the installation. Installer must be willing to provide installation references, with contact information, upon request.

1.02 RELATED SECTIONS

A. Specification Section 26 0526 - Ground and Bonding for Electrical Systems

B. Specification Section 26 4313 - Surge Protective Devices

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2010.

B. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005).

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R 2008).

D. NFPA 70 - National Electrical Code; National Fire Protection Association; 2011.

1.04 QUALITY ASSURANCE

A. The system shall conform to the above cited standards. The system furnished shall be the standard product of a single, UL listed manufacturer regularly engaged in the production of lightning protection systems and shall be the manufacturer's latest approved design. The lightning protection system shall be installed by a firm presently engaged in installations of Master Labeled or LPI certified lightning protection systems. The system as completed shall comply with the latest edition of UL96A, Installation Requirements for Lightning Protection Systems, and NFPA-780 "Standard for the Installation of Lightning Protection Systems." The system shall meet all requirements of these standards and the Lightning Protection Institute Standard of Practice LPI-175. All components required for a complete system shall be provided whether or not such materials are specifically addressed by the contract drawings or described herein.

1.05 SUBMITTALS

A. Complete shop drawings shall be prepared by the manufacturer and submitted to the engineer for approval prior to start of work. System installer shall submit to the design team an original, project specific, notarized certification from the equipment manufacturer verifying their qualifications as a lightning protection installer. Samples and catalog data shall be submitted to the design team for approval upon request.

B. Shop drawings shall identify all system wiring and component placement for the Engineer to review. The Contractor shall not perform any portion of the Work until the respective submittal has been accepted. All work shall be in accordance with accepted submittals.

C. Installation details shall be submitted to the Engineer for review indicating the method of cabling connections and attachments starting at the top of the project building to the ground rods at the counterpoise. All details shall be appropriate for the project.

D. All product data sheets submitted, for proposed system components, shall clearly identify the item being submitted and shall indicate the UL label.

E. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the acceptance of shop drawings, product data, samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and the Engineer has given written acceptance to the specific deviation.

F. Provide documentation of UL master label, LPI certification or equivalent qualification of exact installer intended to do this particular job.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Lightning Protection System:
   1. ERICO, INC.
   2. Engineer approved equals

B. All equipment used shall be factory inspected, approved, and properly labeled in accordance with LPI and UL requirements. All equipment shall be new, the product of a single manufacturer, and of a design and construction to suit the application where used.

2.02 GENERAL REQUIREMENTS

A. All materials used for the system installation shall comply in size, composition and weight to all requirements of NFPA U.L. and LPI for the class of system in which they are installed. All materials shall be labeled or listed by Underwriters Laboratories, Inc. for use in master labeled or LPI certified lightning protection systems.

B. Generally, the external lightning protection system at the roof level shall be constructed of copper cable and copper compatible components. The internal lightning protection system, starting with the down conductors and concluding at the ground termination system shall be constructed of copper cable and copper compatible components. Likewise, all bonding conductors, equipotential loop conductors, etc, shall also be constructed of compatible cable and components.

C. All portions of the system, whether copper or aluminum, shall be galvanically compatible to the building material to which they are to be attached. Connections between copper and aluminum OR copper and gold leaf portions of the system shall be made with appropriate bimetallic coupling devices. In all areas, the conductor shall be supported to maintain clearance from all galvanically incompatible materials or shall be of the same material if permitted within these specifications.

D. All system components (i.e. air terminals, bases, connectors, cable, thru-roof fittings, ground rods, etc.) shall be, to the maximum extent possible, the product of a single manufacturer. All components shall be Class I or II as required by NFPA 780 or as noted. All air terminal bases shall be securely mounted to the building structure by means of mechanical fasteners. Adhesive type air terminal bases are acceptable only where hard setting epoxy adhesive is utilized, where mechanical fastening is prohibited by the roofing manufacturer and where acceptable to the code authority having jurisdiction. Submit shop drawings for all proposed air terminal mounting details.

E. System installation at vertical surfaces and into grade shall be fully concealed. Items which aren't able to be concealed shall be noted in the shop drawing layout and discussed with the design team to determine an alternate routing.

2.03 EQUIPMENT

A. Air Terminals
   1. Air Terminals shall be copper as required to match the building system to which they attach. Air terminals shall protrude a minimum of 10 inches above the object to be protected. Center roof terminals shall be 24” high. Air terminal points shall be blunt with the radius of curvature equal to the rod diameter.
   2. Each air terminal shall be equipped with the correct type of base for the location in which it is mounted.
   3. Air terminals and interconnecting cable shall be provided for all roof mounted equipment (fans, A/C equipment, etc.) subject to a direct strike as required by NFPA 780 and as shown.

B. Conductors
   1. Main roof conductors shall be copper unless otherwise specified or required and shall provide a two-way path from each air terminal horizontally or downward to connections with down conductors. Conductors shall be free of excessive splices and bends. No bend of a conductor shall form an included angle of less than 90 degrees nor have a radius of bend of less than 8 inches. Conductors shall be secured to the structure at intervals not exceeding 3 feet with approved fasteners. Cables connected to “thru-roof” connectors may rise from the roof to the connector at a maximum slope of 3 inches per foot, not exceeding 3 feet horizontally in air.
   2. Down conductors shall be copper and shall be concealed in the exterior wall construction or structural columns. Where run in or on reinforced concrete columns, bond down conductor to the re-bar at top and bottom of column. Down conductors shall be spaced at intervals averaging not more than 100 feet around the perimeter of the structure. If project structure is of structural steel frame construction, down conductors may be omitted and roof conductors shall be connected to the structural steel frame at intervals averaging not more than 100 feet around the perimeter of the structure. Connections to the steel frame shall be made with heavy duty bonding plates having 8 square inches of contact surface or with exothermic welds.
   3. Submit all conductor types in shop drawings. Each conductor shall be identified as to location in the lightning protection system.

C. Roof Penetrations
   1. Roof penetrations required for down conductors or for connections to structural steel framework shall be made using pre-manufactured U.L. approved thru-roof type assemblies with solid rods, PVC sleeves and appropriate roof flashing. Roof flashing shall be compatible with the roofing system and shall be provided under this contract and installed by the roofing contractor. Submit roof flashing data sheets and letter of acceptance from roofing contractor in shop drawing package.
   2. Work required at roof shall not void existing roof warranties.

D. Common Grounding
   1. Common grounding of all ground mediums within the project building shall be made by interconnecting with main size conductors, fittings as required or exothermic welds.
   2. Bonding: Grounded metal bodies located within the required bonding distance (as determined by the bonding distance formulas in NFPA 780) shall be bonded to the system using bonding conductors and fittings. Bond to rebar utilizing exothermic weld connections.

E. Ground Terminations
   1. One ground termination shall be provided for each down conductor and shall consist of (1) 3/4” inch x 10 foot copper-clad ground rod. Each down conductor shall be connected to the ground rod by an exothermic weld connection. Tops of ground rods shall be located 2

feet below finished grade and two feet (2') from the foundation wall and shall extend a minimum of 10 feet vertically into the earth. Where a counterpoise is provided, rods shall be interconnected with the counterpoise.

2. Where the structural steel framework is utilized as the down conductor for the system, every other perimeter steel column shall be grounded but no more than 60 feet apart. Steel columns shall be grounded using bonding plates having 8 square inches of surface contact area or with exothermic welds. Conductors from the steel column connections to the ground terminations shall be full size copper lightning conductors.

F. Fasteners

1. Conductor fasteners shall be manufactured of a material which is compatible with the type of conductor being supported. Fasteners shall be of sufficient strength to properly support each conductor or terminal base, etc.

PART 3 EXECUTION

3.01 INSTALLATION OF CONDUCTORS

A. Conductors shall be installed to interconnect all air terminals to the system of grounding electrodes, and in general provide a minimum of at least 2 paths to ground from any air terminal on the system. Conductors shall provide a horizontal or downward path between the system air terminals and grounding electrode system.

B. Conductors shall be routed in such a manner that maximum concealment from public view is achieved. Down conductors may be installed in one-inch PVC conduit from roof to grade.

C. Counterpoise conductors shall be installed after finished grades are established to insure specified depth and to minimize the possibility of damage. Any counterpoise conductor which is cut or damaged shall be repaired or replaced with no additional cost to the contract.

D. All connections between conductors below grade shall be exothermically welded. Improper application of weld shall be replaced at no additional cost to the contract.

3.02 BONDING OF SECONDARY METALLIC BODIES

A. Structure Grounding: Provision shall be made at the roof level on reinforced concrete structures for bonding between the roof or down conductors, metallic elements of the roof system and metallic exterior wall systems.

B. All down conductors run in concrete columns shall be bonded to the reinforcing steel at the top and the bottom of the column.

3.03 GENERAL WORKMANSHIP

A. All elements of the Lightning Protection System shall be installed in a professional and workmanlike manner consistent with the best industry practices.

B. All system components shall be concealed to the maximum extent possible to preserve the aesthetic appearance of the project building on which the system is installed.

3.04 COORDINATION WITH OTHER TRADES

A. Coordination: The Contractor shall coordinate their work with all trades, to insure the use of proper materials and procedures in and around the roof in order not to jeopardize the roofing warranty.

B. Where fasteners are to be embedded in masonry or the structural system, they shall be coordinated to insure installation at the proper time of construction.

C. Upon completion of the installation the Contractor shall provide to the owner the Master Label issued by Underwriters Laboratories, Inc. for the installation, and the LPI certification issued by LPI.

END OF SECTION

SECTION 26 43 13
SURGE PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surge Protective Devices - External

B. Surge Protective Devices - Internal

1.02 REFERENCES

A. UL 1283 - Electromagnetic Interference Filters

B. ANSI/IEEE C62.41.1-2002 - IEEE Guide on the Surge Environment in Low Voltage (1000 V and Less) AC Power Circuits

C. ANSI/IEEE C62.41.2-2002 - IEEE Recommended Practice on Characterization of Surge Voltages in Low Voltage AC Power Circuits

D. ANSI/IEEE C62.45-2002 - IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits

E. NFPA 70 - National Electric Code - Article 285

1.03 RELATED SECTIONS

A. Specification Section 26 0519 - Electrical Power Conductors and Cables

B. Specification Section 26 0526 - Grounding and Bonding

C. Specification Section 26 0533 - Raceways and Boxes for Electrical Systems

1.04 SUBMITTALS

A. Product data and manufacturer's installation instructions for non-approved manufacturers shall be submitted for review prior to the bid date.

B. Submittals shall include:
   1. Dimensional drawing of each SPD type.
   2. Dimensional drawing of each SPD enclosure.
   3. UL 1449 Current Edition Listing, Standard for Safety, Surge Protective Devices, documentation.
   4. UL 1283 Listing, Electromagnetic Interference Filters, documentation.
   5. ANSI/IEEE C62.41 and C62.45, Category C3 (20kV-1.2/50, 10kA-8/20microsecond waveform) clamping voltage test results.

PART 2 PRODUCTS

2.01 SURGE PROTECTION DEVICES

A. For external mount device, the manufacturer shall be from approved list below. For internal mount devices, the manufacturer of the SPD shall be the same as the manufacturer of the service entrance and distribution equipment in which the devices are installed and shipped. Also, the distribution equipment shall be fully tested and certified to the following UL standards:
   1. UL 67 = Panelboards.
   2. UL 891 = Switchboards.

B. Basis of Design: The system shall be constructed using multiple surge current diversion thermally protected metal oxide varistors (TPMOV). The surge current circuit shall be designed and constructed in a manner that ensures surge current sharing. Use of gas tubes, silicon avalanche diodes or selenium cells are unacceptable unless documentation from a nationally recognized laboratory demonstrates current sharing of all dissimilar components at all surge current levels. The listing of a manufacturer as acceptable does not imply automatic approval .

2.02 SURGE PROTECTION DEVICE MANUFACTURERS

A. ASCO Power Technologies (APT)

B. Square D/Schneider Electric

C. ABB

D. Siemens

E. Eaton

F. Liebert

2.03 RATINGS

A. Minimum Surge Current Capability (single pulse rated) Per Phase Shall Be:
   1. Main Service Entrance and Emergency Switchboard: 300 kA per phase/150kA per mode
   2. Distribution Panelboards: 200 kA per phase /100kA per mode
   3. Branch Panelboards: 100 kA per phase/50kA per mode

B. UL 1449 clamping voltage must not exceed the following: Voltage Protection Rating (VPR)

VOLTAGE	L-N	L-G	N-G
208Y/120	700V	700V	700V
480Y/277	1200V	1200V	1200V

C. UL1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

SYSTEM VOLTAGE	ALLOWABLE SYSTEM VOLTAGE FLUCTUATION (%)	MCOV
208Y/120	25%	150V
480Y/277	15%	320V

D. SPD shall provide suppression for all modes of protection: L-N, L-G, and N-G in WYE systems. (Minimum 7 Modes)

2.04 DESCRIPTION

A. SPD shall be listed in accordance with UL 1449 Current Edition Type 2 device and UL 1283, Electromagnetic Interference Filters.

B. Integrated surge protective devices (SPD) shall be "component recognized" in accordance with UL 1449 Current Edition, Section 37.3.2 and 37.4 at the standards highest short circuit current rating (SCCR) of 200 kA, including intermediate level of fault current testing that will be effective 9/29/2009.

C. SPD shall be tested with the ANSI/IEEE Category C High exposure waveform (20kV-1.2/50ms, 10kA-8/20ms).

D. Pulse Life Test: Capable of protecting against and surviving 5000 ANSI/IEEE Category C High transients without failure or degradation of clamping voltage by more than 10%.

E. Minimum UL 1449 current edition withstand Nominal Discharge Current (In) rating to be 20kA per mode.

F. SPD shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.

G. SPD shall be constructed of one self-contained suppression module per phase.

H. Visible indication of proper SPD connection and operation shall be provided. The indicator lights shall indicate which phase as well as which module is fully operable. The status of each SPD module shall be monitored on the front cover of the enclosure as well as on the module. A push-to-test button shall be provided to test each phase indicator. Push-to-test button shall activate a state change of dry contacts for testing purposes.

I. SPD shall be equipped with an audible alarm which shall activate when any one of the surge current modules has reached an end-of-life condition. An alarm on/off switch shall be provided to silence the alarm. The switches and alarm shall be located on the front cover of the enclosure.

J. A connector shall be provided along with dry contacts (normally open or normally closed) to allow connection to a remote monitor or other system. The output of the dry contacts shall indicate an end-of-life condition for the complete SPD or module.

K. Terminals shall be provided for necessary power and ground connections.

L. The SPD shall be Equipped the Following Optional Items:
   1. A transient voltage surge counter shall be located on the diagnostic panel on the front cover of the enclosure for the service entrance device . The counter shall be equipped with a manual reset and battery backup to retain memory upon loss of AC power.
   2. A remote monitoring device shall be provided to directly connect to the SPD with a dry contact connector for simple installation. The device will have indicator lights and an audible alarm to monitor for normal and fault conditions.
   3. Advanced Monitoring for the service entrance device that includes the following features: 1) communication via Ethernet, Modbus, RS-435 with embedded webpage, 2) integral LCD display, 3) event date/time stamp with duration and magnitude, 4) on board data storage of up to 2,000 events with a sampling rage of 4,166/second (4µs).

M. SPD shall have a warranty for a period of ten-years from date of invoice. Warranty shall be the responsibility of the equipment manufacturer and shall be supported by their respective field service division.

PART 3 EXECUTION

3.01 INSTALLATION

A. For external mount devices, install surge protection devices (SPD's) at the power distribution equipment for use at the utility service entrance to the facility and at each distribution switchboard and branch panelboard to be protected.

B. The service entrance SPD shall be installed on the load side of a service disconnect overcurrent device per NEC.

C. The SPD's ground shall be connected to the power system ground.

D. Before energizing, installer shall verify service and separately derived system Neutral to Ground bonding jumpers per NEC.

E. Where the SPD is connected to the power system with cables, keep the conductors as short as possible with no sharp bends.

F. At the service entrance, connect the SPD to a 60 amp circuit breaker. If a 60 amp circuit breaker is not available, a UL-approved disconnect switch shall be provided with the SPD as a means of servicing disconnect.

G. At distribution switchboards and branch panelboards, connect the SPD to a 30 amp circuit breaker. If a 30 amp circuit breaker is not available, a UL approved disconnect switch shall be provided with the SPD as a means of servicing disconnect.

H. Installer may reasonably rearrange circuit breaker locations to ensure shortest and straightest possible leads to SPD's.

I. Provide and install internal or external SPD's with flush mount kits where recessed panelboards are installed in finished spaces.

J. Provide and install a listed SPD in or on all emergency system switchboards, distribution panels and panelboards per NEC 700.8.

END OF SECTION

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SECTION 26 51 00
INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. LED Drivers

B. Light Emitting Diodes (LEDs)

1.02 REFERENCES

A. ANSI C78.379 - American National Standard for Electric Lamps -- Reflector Lamps -- Classification of Beam Patterns; 2006

B. NECA/IESNA 500 - Recommended Practice for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association

C. NECA/IESNA 502 - Recommended Practice for Installing Industrial Lighting Systems; National Electrical Contractors Association

D. NEMA WD 6 - Wiring Devices - Dimensional Requirements; National Electrical Manufacturers Association

E. NFPA 70 - National Electrical Code; National Fire Protection Association

F. NFPA 101 - Life Safety Code

G. IESNA LM-79-08 - Approved Method for the Electrical and Photometric Measurement of Solid-State Lighting Products

H. IESNA LM-80-08 - Approved Method for Measuring Lumen Maintenance of LED Light Sources.

I. IESNA TM-21-11 - Projecting Long Term Lumen Maintenance of LED Light Sources

J. EU Directive 2002/95/EC - Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS), as amended by directive 2005/618/EC

1.03 SUBMITTALS

A. Provide cut sheet indicating dimensions and components for each luminaire.

B. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

C. Submit manufacturer's operation and maintenance instructions for each product.

D. All lighting submittals must be on Local Authorized Manufacturer Representative's letterhead and contain Project Name and Location.

E. Closeout: Provide list of Extra Materials for owner to verify and sign for acknowledgement of receiving.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70 and NFPA 101.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70 and 101

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

C. Products with Light Emitting Diodes:

1. Fixtures shall comply with LM-79-08: Electrical and Photometric Measurements of Solid-State Lighting Products.
2. Interior fixture diode arrays shall maintain +/-100 degrees Kelvin (K); exterior fixture diode arrays shall maintain +/- 500 K color temperature range through the life of the fixture.
3. Diode arrays shall be wired so that if one diode fails, at least 90% of the remaining diodes will operate.

PART 2 PRODUCTS

2.01 LED DRIVERS:

A. Manufacturers must be in business a minimum of (5) years.

B. Drivers shall be provided with light emitting diodes as a modular replaceable system. The system shall be fully designed and tested for operation throughout warranted period.

C. Driver shall be Underwriters Laboratories (UL) listed, Class 2 Outdoor recognized.

D. Driver shall be suitable for damp locations.

E. Driver shall operate from -20 to 60 deg C.

F. Refer to fixture schedule on drawings for additional requirements.

G. Driver shall operate from 50 to 60 Hz input source of 120 V, 208 V, 240V, 277 V and/or 480 V, as required in plans, with sustained variations of +/-10% (voltage and frequency) with no damage to the driver.

H. Driver output shall be regulated to +/- 5% across published load range.

I. Driver shall have an “A” sound rating.

J. Driver shall have a power factor greater than 0.9.

K. Driver input current shall have Total Harmonic Distortion (THD) of less than +/-20% at all operating voltages.

L. Driver shall tolerate sustained open circuit and short circuit output conditions without damage and without need for external fuses or trip devices.

M. Driver shall carry a five-year warranty from the date of manufacture against defects in material or workmanship, including replacement for operation at a maximum case temperature of 90 deg C.

N. Driver shall have an efficiency greater than or equal to 85%.

O. Driver shall comply with Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 15, Non-consumer (Class A) for EMI/RFI (conductive and radiated).

P. Driver shall not contain any Polychlorinated Biphenyl (PCB).

2.02 LIGHT EMITTING DIODES (LEDS):

A. Manufacturers must be in business for a minimum of (5) years.

B. Light Emitting Diodes shall be provided with a driver as a modular replaceable system. The system shall be fully designed and tested for operation throughout warranted period.

C. Diode arrays shall maintain +/-100K color temperature through the life of the fixture.

D. Diodes shall have a minimum color rendering index of 80.

E. Diodes and associate circuitry shall be RoHS compliant.

F. Diodes shall be photometrically tested for compliance with IESNA LM-80-08, with projections calculated in accordance with IESNA TM-21-11.

G. Diode arrays shall maintain a minimum 70% lumen output through an average operating life of 50,000 hours.

H. Diodes and associated printed circuit boards shall be RoHS compliant.

I. Refer to Lighting Fixture Schedule for color temperature requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Furnish products as specified in schedule on the drawings.

C. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required suspending luminaire at indicated height.

D. Locate recessed ceiling luminaires as indicated on reflected ceiling drawing and electrical lighting drawings.

E. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.

F. Install recessed luminaires to permit removal from below.

G. Install recessed luminaires using accessories and fire stopping materials to meet regulatory requirements for fire rating.

H. Install clips to secure recessed grid-supported luminaires in place.

I. Install recessed can luminaires to fit in ceiling. Provide all necessary trim ring extenders or other accessories for proper installation of luminaire in ceiling.

J. Install wall mounted luminaires, emergency lighting units and exit signs at height as scheduled.

K. Install accessories furnished with each luminaire.

L. Fixture whips utilizing THHN/THWN-2 wire in flexible metal conduit shall be used to connect all luminaires, emergency lights, and exit signs. Minimum wire size for all fixture whips shall be 14 AWG. Fixture whips shall be wired directly from the luminaire to an accessible junction box. Fixture to fixture whips are not allowed. Maximum length for any fixture whip shall be 6'.

M. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

N. Bond products and metal accessories to the branch circuit equipment grounding conductor.

O. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure. Provide auxiliary members spanning ceiling grid members to support surface mounted luminaires.

P. Support luminaires larger than 2' x 4' size independent of ceiling framing.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.03 ADJUSTING

A. Aim and adjust luminaires as directed.

B. Position exit sign directional arrows as indicated.

3.04 WARRANTIES

A. All warranties shall remain as an agreement between the installing contractor and the manufacturer. No third parties shall be involved with warranty repairs or replacements of installed products without the written consent of the installing contractor and the owner or their representative.

B. Labor for warranty repairs shall be billed by the contractor directly to the manufacturer or distributor during the duration of the labor warranty on the originally installed products. Labor work required on warrantied parts, but outside of the 1-year labor warranty shall be the responsibility of the owner.

3.05 CLEANING

A. Clean all electrical parts to remove all of the conductive and deleterious materials.

B. Remove dirt and debris from enclosures.

C. Clean photometric control surfaces as recommended by manufacturer.

D. Clean finishes and touch up damage.

3.06 SCHEDULES

A. See the drawings.

3.07 EXTRA MATERIAL AND LABOR

A. The electrical contractor shall include in their bid an allowance to install an additional two exit signs of each type as scheduled including an average 50 feet of raceway, associated wiring, back box and labor, and all accessories required to energize each device requested. Fixture(s) may be added anytime during the construction process as requested by the owner or design team. See schedule on drawings for types. Any materials that are not used during construction shall be turned over to the owner at the final acceptance of the building.

B. Drivers:

1. The electrical contractor shall include in their bid, two (2) additional drivers for all wattages, voltages, and configurations required on the project.
2. Extra materials shall be turned over to the owner at substantial completion in their original unopened packaging.
3. All drivers shall be clearly marked for the fixture types that they are compatible with based on the drawings, fixture schedule and submittals received.
4. Extra drivers included in this requirement shall not be used for warranty replacements without replacing this extra stock in the owner’s inventory.
5. No labor should be added to the project over the standard warranties already required in previous sections.

END OF SECTION

SECTION 26 52 00
EMERGENCY LIGHTING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Emergency lighting inverters

1.02 RELATED SECTIONS

A. Specification Section 26 0943 - Digital Lighting Control Systems

B. Specification Section 26 5100 - Interior Lighting

1.03 REFERENCES

A. NFPA 101 - Life Safety Code

B. NFPA 70 - National Electrical Code

C. UL 924 - Standards for Emergency Lighting & Power Equipment

D. NEMA 410 - Performance Testing for Lighting Controls & Switching Devices

1.04 SUBMITTALS

A. Shop Drawings: Indicate dimensions and components for each physical component.

B. Wiring Diagram: Submit a wiring diagram from the manufacturer showing wire size, wire type, and proposed routing within the building between all components of the system.

C. Product Data: Provide dimensions, ratings and performance data.

D. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of product.

E. Submit manufacturer's operation and maintenance instructions for each product.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the emergency lighting products specified in this section with minimum five years of experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 101 and NFPA 70.

B. All electronic drivers shall be provided to satisfy and conform to the in-rush requirements of NEMA 410.

C. Products: Listed and labeled as required by Underwriter's Laboratories Standard for Safety UL 924, Emergency Lighting and Power Equipment, as suitable for the purpose specified and indicated.

1.07 WARRANTY

A. The manufacturer shall warrant the emergency lighting inverter for a period of 12 months after Substantial Completion. Provide 10 year pro-rated warranty on battery, pro-rated after first year on straight line basis.

B. Emergency drivers shall have a full five (5) year, non-prorated warranty.

C. Include coverage of travel, labor, parts and service.

1.08 PREINSTALLATION MEETING

A. The contractor shall schedule a pre-installation meeting with the manufacturer or manufacturer's representative prior to the installation of any systems or components.

PART 2 PRODUCTS

2.01 EMERGENCY LIGHTING INVERTERS

A. Manufacturers
   1. Dual-Lite
   2. Philips Chloride
   3. Iota
   4. Engineer approved equal.

B. System Description: Emergency lighting inverter shall provide control and battery backup power for a minimum of 90 minutes to all emergency egress luminaires and exit signs connected to the system. In ICC500 safe rooms and other areas noted on the drawings the emergency lighting inverter shall provide a control and battery backup power for a minimum of 120 minutes. Emergency lighting inverter shall have common derangement and audible tones including a silence switch arranged for ring back failure. Emergency lighting inverter shall be surface mounted with factory finish with labeling installed.

C. Input Voltage: Refer to schedule on drawings.

D. Output Power: Refer to schedule on drawings.

E. Battery Operating Time: 90 minutes at full load and within output voltage limits.

F. Output Voltage: Refer to schedule on drawings.

G. Inverter Output Frequency: 60 Hertz ± 1 percent.

H. Maximum Recharge Time: 12 hours following 1.5-hour discharge.

I. Total Harmonic Distortion: Less than 10 percent at full resistive load.

J. Transfer Time: Maximum 50 milliseconds with static transfer switch.

K. Battery: Lead calcium, sealed maintenance-free type. Low voltage battery disconnect protects the battery from “deep discharge” during prolonged power outages.

L. Lamp Indicators: AC ON and HIGH CHARGE.

M. Charger: Dual rate, designed to maintain battery in full-charge condition during normal conditions.

N. Self-test/Self-diagnostics: Automatically perform and log monthly 1-minute test and annual 60-minute test.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

B. Install emergency lighting inverter(s) plumb and level with required clearances.

C. Provide interconnection between cabinets.

D. Connect all emergency lighting units, exit signs and light fixtures designated for emergency use with unswitched hot conductor from the nearest electrical power circuit.

E. Locate test switches integral to light fixture(s) when possible.

F. Coordinate remote test switch locations with design team prior to installation.

G. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

H. Bond products and metal accessories to the branch circuit equipment grounding conductor.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation to satisfy NFPA 101 requirements.

B. Include services for emergency lighting inverter technician to supervise adjustments, final connections, and system start-up.

3.03 CLEANING

A. Clean all electrical parts to remove all of the conductive and deleterious materials.

B. Remove dirt and debris from enclosures.

C. Clean photometric control surfaces as recommended by manufacturer.

D. Clean finishes and touch up damage.

3.04 COMMISSIONING OF EMERGENCY LIGHTING INVERTER SYSTEMS

A. Operating Environment for inverters:
   1. -30deg F to +136deg F
   2. Relative humidity: 0- to 95% non-condensing
   3. Inverters and their enclosures shall remain fully protected on the job site until commissioning is to be completed. Construction dust and debris discovered on the interior of the inverter enclosure will void the warranty and possibly require replacement components

B. Factory Start-up:
   1. All inverters over 1500w shall be started-up and commissioned by a trained factory service representative. Contractor to coordinate with manufacturer to schedule this visit.

C. Site testing:
   1. The manufacturer's field service personnel shall provide site testing if requested and included in the manufacturer's bid. The testing shall consist of a complete test of the inverter system and the associated accessories supplied by the manufacturer. A partial battery discharge test shall be provided as part of the standard start-up procedure. The test results shall be documented, signed, and dated for future reference.

END OF SECTION

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SECTION 27 00 50
BASIC COMMUNICATIONS REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Communications Requirements specifically applicable to Electrical Division Specification Sections.

B. Division 27 Specification requirements also include, by reference, all Division 00 and 01 specification sections. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

1.02 WORK BY OWNER

A. The Following Work or Sub Contracts Will Be Furnished and Installed (OFOI) By The Owner:
   1. Telephone system equipment and installation.
   2. Computer network equipment and installation.
   3. Computer workstation equipment and installation.
   4. Audio and visual system equipment and installation.
   5. Audio Visual System hardware for Council Chambers
   6. Interactive Projectors (Contractor Installed)

B. The Following Products Will Be Furnished By The Owner Bidding Contractor Shall Install (OFCI):
   1. Wireless access point (WAP) hardware (bidding contractor shall install).
   2. Televisions/Monitors (Contractor Installed)
   3. Television/Monitor Mounts (Contractor Installed - see A/V specs for Contractor Furnished/Contractor Installed items.)
   4. Interactive Projectors (Contractor Installed)

C. Owner's Responsibility:
   1. Arrange for and deliver owner reviewed shop drawings, product data and samples to contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with contractor.
   4. Submit claims for transportation damage and replace damaged, defective or deficient items.

D. Contractor's Responsibility:
   1. Review owner reviewed shop drawings, product data and samples.
   2. Review and unload owner purchased materials at site, inspect for completeness and/or damage jointly with the owner.
   3. Handle, store, install and finish products. Install electrical wiring and devices.
   4. Repair and/or replace items damaged after receipt.

1.03 OWNER OCCUPANCY

A. The owner will not occupy the premises during the construction period.

B. Limit use of site and premises to allow owner occupancy.

C. Cooperate with the owner to minimize conflict and to facilitate owner's operations.

D. Schedule the work to accommodate this requirement.

1.04 REGULATORY REQUIREMENTS

A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.

B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by themselves, by their employees or through any operation under their charge, whether in the contract or extra work.

C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.

D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve the contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.

E. All work shall comply with the applicable recommendations of:
   1. National Board of Fire Underwriters
   2. ANSI-NFPA 70 National Electrical Code
   3. National Fire Protection Association (NFPA)
   4. Occupations Safety and Health Act (OSHA)
   5. IBC Building Code (current) and any current applicable city building and or electrical codes.
   6. Fire Protection: Conform to International Fire Code (IFC) and NFPA
   7. International Energy Conservation Code (IECC)

F. Obtain permits and request inspections from authority having jurisdiction.

G. Conform to latest approved versions of codes.

H. ICC 500 Rated Storm Shelter
   1. The contractor shall comply with all installation requirements as dictated in applicable in the current ICC 500 ICC/NSSA Standard for the Design and Construction of Storm Shelters.
   2. Refer to drawings for ICC 500 footprint extents and additional requirements.
   3. ALL CONDUIT GREATER THAN 2" IN DIAMETER PENETRATING THE STORM SHELTER STRUCTURE SHALL USE STEEL ELBOWS. COORDINATE ALL PENETRATIONS WITH DESIGN TEAM DURING SHOP DRAWING PHASE.
   4. Numerous penetrations may occur within a single shroud. Coordinate with other trades for bunched penetrations.

1.05 PROJECT/SITE CONDITIONS

A. Install work in locations shown on drawings unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer before proceeding.

C. This contractor shall, before submitting their bid, visit the site of the project to familiarize themselves with locations and conditions affecting their work.

D. It is the intent of this specification that the contractor furnishes all labor and material required to complete the installation as outlined in the drawings and specifications. No additions to the contract price shall be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing wiring conduits, electrical panels, equipment, services and grades be noted on the job site before bid is submitted and that all elevations and grades be verified before roughing in new work.

F. This contractor shall provide holes as necessary for the installation of their work and in accordance with materials other than the structure.

1.06 SEQUENCING AND SCHEDULING

A. This contractor shall arrange their work in order that it progresses along with the general construction of the building.

B. This contractor shall be kept informed as to the work of other trades engaged in this project and shall execute their work in such a manner so as not to delay or interfere with progress of other contractors.

C. Where space for electrical lines and conduit is limited, it is imperative that all such trades coordinate their work so as to ensure concealment in space provided. Where conflict exists, the design team shall decide priority of space. If work is not properly coordinated, the design team may require removal and relocation of work without additional compensation.

1.07 GUARANTEE

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished and labor installed under this contract for a period of one year after date of final acceptance, unless a longer period is specified.

B. Neither final certificate of payment nor any provisions in the contract documents nor partial or complete occupancy of premises by owner shall constitute an acceptance for work not done in accordance with contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

C. Should any defects arise as the result of defective workmanship or material within the guarantee period set forth, this contractor shall make the necessary correction at their own expense.

1.08 ENGINEER APPROVED EQUAL PRODUCTS

A. When the engineer, at the request of the interested parties, including the contractor, supplier and manufacturer approved "engineer approved equal" products for this project, such products are approved on the assumption that they will equal or exceed the performance of the products specified.

B. If such products do not do so after being installed on this project, this contractor shall replace or modify the particular product as necessary to equal the performance of the products specified at no expense to the owner, architect or engineer.

C. Request for "engineer approved equal" products shall be received by the architect/engineer prior to the last addendum being issued. Requests for substitutions received after this date will not be considered. Substitution requests shall clearly state which products are being considered for substitution. Substitution requests shall include all pertinent product information needed to evaluate the substitution as an "equal".

D. Similar products shall be all of the same manufacturer and style. There is no exception to this unless prior approval has been granted from engineer.

1.09 OWNER'S RIGHT OF SALVAGE

A. Before beginning construction, the contractor shall check and verify with the owner each item of existing equipment that must be removed.

B. The owner will designate which items of material or equipment not reused that he may wish to keep. The contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.

C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their use shall become the property of the contractor and shall be removed from the site.

1.10 TELECOMMUNICATIONS UTILITY COMPANY

A. The contractor is required to assist in coordination of final telecommunications utility locations that will serve the building with telephone, internet and cable television services. See 26 0050 for additional information.

1.11 PROTECTION AND MAINTENANCE

A. The work covered by these drawings and specifications involves all work in the new addition and existing building.

B. Where necessary to connect to any existing utility service, this electrical contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.

C. Any work to be done in existing structures shall be coordinated with the owner and arrangements made so that traffic flow may be maintained and areas finished where possible before other areas are begun.

D. This contractor shall protect existing equipment in finished areas from dirt, dust, and damage as a result of their work.

E. Coordinate protection requirements with department heads before beginning construction.

F. Protect any building openings from unauthorized entry. Coordinate with owner where building entry must be controlled.

1.12 DEMOLITION

A. This contractor shall be responsible for the demolition and removal of all existing system elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be reused".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.
   4. All elements to be removed are subject to the Owner's Right of Salvage.

B. Preserve services to the existing facility. Extend/reroute/reconnect the existing systems as required providing for the continued function of these systems.

1.13 CUTTING AND PATCHING

A. This contractor shall do all cutting and patching necessary for the installation of their work in all existing and new buildings unless otherwise noted.

B. In areas where the integrity of fire separation assembly/wall is compromised by the work, this contractor shall be responsible to patch and/or seal openings as necessary to maintain and/or return fire separation to rating as required by applicable codes.

C. This contractor shall do all cutting and patching required for their work beyond the remodeled areas unless otherwise noted. All finish work shall include patching to match existing adjacent surfaces. Painting shall be by others.

1.14 CLEANING AND RUBBISH

A. This contractor, upon completion of their work, shall remove all rubbish and debris resulting from theirs operation and shall remove it from site at their own expense.

B. As far as their work is concerned, all equipment shall be cleaned and the premises left in first class condition.

C. This contractor shall maintain the work area each day to prevent hazardous accumulation of debris from their work.

1.15 SEALING AND PENETRATION

A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.

B. This contractor shall verify rating and location of all such construction with the architectural drawings and seal all penetrations.

C. Manufacturer offering products to comply with the requirements include the following:
   1. Dow Corning "Silicone RTV Foam"
   2. 3-M Corporation "Fire Barrier Caulk and Putty"
   3. Thomas and Betts "Flame Safe Fire Stop System"
   4. Specified Technologies "EZ-Path"

D. Installation of these products are to be in strict accordance with the manufacturer's recommendations and architectural specifications, details or equivalent fire stopping general specification section.

E. This contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.16 HAZARDOUS MATERIALS

A. If the contractor stores any hazardous solvents or other materials on the site, they shall obtain copies of the safety data sheets for the materials and post them at the site. The contractor shall inform the owner and all employed of any potential exposure to this material.

B. At no time shall any product containing asbestos be incorporated into the work.
   1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.17 SUBMITTALS / RECORD DOCUMENTS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years.
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents.
   4. Have options clearly indicated as applicable to each submittal.
   5. Refer to Architectural Specification Sections for additional requirements.

1.18 ALTERNATES

A. Refer to description of alternate bids under General Specification Sections.

1.19 REVIEW OF MATERIALS

A. This contractor shall submit to the engineer, for review one (1) electronic copy giving a complete list of materials, fixtures, devices and panels he proposes to furnish. The brochure shall contain complete information as to the model of equipment, type, size, capacities, dimensions, and illustration. An electronic copy shall be kept on the job at all times.

B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless he notifies engineer, in writing, of such deviation at time such drawings are furnished.

C. All submittals shall have the date marked on them when the contractor receives them from the supplier. Submittals shall be submitted through the contractor and shall not come direct from the supplier to the architect or engineer.

D. This contractor shall mark the date and sign each set signifying that the contractor has checked each of them in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted, or checked and will be marked "resubmit" and sent back to the contractor.

1.20 TEST OF SYSTEMS

A. This contractor, before concealed, shall test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence

of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.

B. This contractor shall coordinate all testing of systems within Division 27 specification section. Follow manufacturer's recommended testing procedures as a minimum unless the following related specification section has further detail of testing procedures. The more stringent testing procedure shall be used.

1.21 SCOPE OF WORK

A. This contractor shall furnish all the labor and material to install a complete communication system in the new building. The system shall include all items of work as outlined in these specifications and on the drawings.

B. All work shall be performed by a well-qualified, licensed or certified technician with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their technicians are familiar with all the various codes, installation procedures and tests applicable to this work.

C. All equipment shall be new and of the type specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

D. The intent of the specifications and drawings is for complete installation of the systems outlined in the specifications and drawings so that at the conclusion of construction the system will be turned over to the owner complete and ready for safe and efficient operation.

E. This contractor is required to furnish and install all such items normally included on systems of this type, which, while not mentioned directly herein or on the drawings are obviously essential to the installation and operation of the system and which are normally furnished on quality installation of this type. The specifications and drawings cannot deal individually with the many minute items that may be eventually required by the nature of the systems.

F. This contractor, shall before proceeding with any work, review the architectural drawings and specifications. Any conflict between the technology and architectural drawings and specifications shall be reported to the engineer for clarification.

G. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer’s attention and an addendum is issued for clarification.

H. The Communications Contractor shall establish system elevations prior to fabrication and installation. The Communications Contractor shall coordinate elevations with other trades. All elevations shall be coordinated with all trades in the field prior to installation. When a conflict between trades arises, the design team shall be notified immediately prior to further installation however priority shall be as follows:
   1. Lighting Fixtures
   2. Gravity flow piping, including steam and condensate.
   3. Electrical bus duct.
   4. Sheet metal.
   5. Cable trays, including access space.
   6. Other piping.
   7. Conduits and wireway.

I. Low Voltage Cable Installation
   1. This contractor is to install if they are licensed to, or contract with a licensed electrician to install conduit serving low voltage cables located in all mechanical rooms and non-accessible areas and exposed structural areas. Use cable trays in other areas as indicated on the drawings. Where cable trays are not accessible, use J-hooks equal to Cablofil or Caddy Cable CAT. No cable shall be allowed to lie on accessible ceilings tiles. Provide sleeves between walls and accessible clouds. Provide hooks with closure holes. Mount hooks 3 feet on center.
   2. All vertical riser and telecommunication room cabling shall be properly supported and bundled by approved velcro straps every 3 feet. Cable ties (zip ties), or other tie systems that cause compression, crushing, or pinching of cabling shall not be allowed.

1.22 DAILY HOUSEKEEPING AND CLEANING

A. At the end of each workday, the contractor shall remove all of their debris, rubbish, tools, and surplus materials from the project work area. The work area shall be broom cleaned and left in a neat and orderly condition. The contractor, for the removal of debris from the project, shall not use the owner's waste disposal facility.

B. At end of construction, all equipment shall be cleaned and the premises left in first class condition as far as this contractor's work is concerned.

1.23 WALL CONTINUITY (1 HR.)

A. All items mounted in 1 hr. rated walls requiring an opening larger than a four inch (4") square (16 sq. inches) require the 1 hr. rating not be degraded.

B. Any system panels in a 1 hr. wall will require the exterior of the recessed panel be covered with 5/8 inch fire rated gypsum board. This is true for any device requiring more than a 16 sq. inch opening.

1.24 ALLOWANCES

A. Include a $10,000.00 allowance in the bid amount for owner or engineer directed changes during the construction period. Changes shall be priced prior to proceeding with the work. Any amount left over at the conclusion of the project shall be deducted from the contractor's last payment application.

1.25 DIGITAL MEDIA AGREEMENT

A. Computer Aided Drafting (CAD) documents may be available to the contractor for some uses. Contact the engineer prior to bidding to determine what information is available to be transmitted to the contractor in digital form.

B. When documents are determined to be available, and as requested by the contractor, they will be transmitted upon the completion and execution of the MODUS digital media agreement. A service fee for each document transmitted will be assessed to the contractor. Documents will be transmitted upon payment receipt. Current service fee is $100.00 per CAD sheet.

1.26 SECURE NETWORKABLE DEVICES

A. Update network devices to the most current software/firmware.

B. Change default password of all networkable devices.
   1. Passwords shall have at least eight characters.
   2. Include uppercase and lowercase letters, numerals, and special characters

C. Supply MAC address and serial number of all networkable devices.

D. Work with the Owner's IT department to align to existing IT standards.

E. Provide to the owner a printed and/or electronic spreadsheet log of all network information including, IP addresses, MAC addresses, logins and password information during system training.

1.27 SYSTEM CONFIGURATION AND PROGRAMMING FILES

A. Supply system configuration and programming files where export is available.

B. Supply uncompiled programming for systems applicable.

C. All configuration and programming shall be property of the owner at conclusion of the project.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

SECTION 27 00 90
MINOR COMMUNICATION DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements of the Contract Forms, the Conditions of the Contract, Division 1 - General Requirements and Specification Section 26 0050 - Basic Electrical Requirements "General Provisions" apply to this section.

1.02 SCOPE

A. This contractor shall be responsible for the demolition and removal of all existing communication elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.

B. Preserve services to the existing facility. Extend, reroute, and reconnect existing systems as required providing for the continued function of these systems.

C. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

D. This contractor shall remove all abandoned equipment, cabling and boxes associated with the remodeled area unless noted otherwise.

E. This contractor is responsible for providing communication cabling protection for all existing systems to remain during this project.

1.03 MATERIALS

A. All elements to be removed are subject to the Owner's Right of Salvage.

B. All materials removed shall be the property of the removing contractor and shall be removed from the site by them, unless otherwise specified.

C. The owner may designate and have salvage rights to any material herein demolished by this contractor. It will be the owner's responsibility to designate such salvageable items and remove them prior to the contractor working in that area.

1.04 EXISTING CONDITIONS

A. Demolition plans are based on casual field observations and existing record documents. Report discrepancies to the owner before disturbing existing installation. Beginning of demolition means installer accepts existing conditions.

B. If any existing equipment, cabling or devices that are to remain are disturbed by operations under this contract, this contractor is required to re-establish continuity of such systems according to owner approved standards and methods.

C. This contractor shall arrange for the general contractor to repair and patch all construction with material necessary to match surrounding due to removal of equipment and conduit.

D. This contractor shall furnish all required labor and material for extension of existing systems.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Beginning of demolition means installer accepts existing conditions.

B. Verify existing structured cabling, special systems wiring topology, and reconnect as necessary.

C. Verify that abandoned cabling being removed is disconnected from the source and is not actively serving other areas of the existing building. Reconnect as required to prevent any system downtime.

D. Demolition drawings are based on casual field observation and existing record documents. Report discrepancies to the owner before disturbing existing installation.

3.02 PREPARATION

A. Disconnect structured cabling and special systems components in walls, floors, and ceilings scheduled for removal. Disconnect circuits at the source.

B. Coordinate any service outage with all of the owner's existing telecommunications service providers.

C. Existing Communication Network: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchover connections. Obtain permission from the owner, at least 5 days before partially or completely disabling system. Minimize outage duration. Make temporary connections as required.

D. Existing Telephone System: Maintain existing system in service.

E. Maintain all existing communication lines to the building fire alarm system, elevators and intrusion system.

3.03 DEMOLITION AND EXTENSION OF EXISTING COMMUNICATIONS WORK

A. Demolish and extend existing communications work under provisions of this section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Disconnect abandoned cable and remove devices. Provide a blank cover for abandoned devices that have not been removed.

E. Disconnect and remove abandoned patch panels, cross connect fields and special systems distribution equipment.

F. Disconnect and remove devices and equipment serving abandoned special systems.

G. Repair adjacent construction and finishes damaged during demolition and extension work.

H. Extend existing installation using materials and methods compatible with existing communications installations or as specified.

I. Cable to remain shall be installed in retrofit sleeve/grommet for a clean installation.

3.04 CLEANING AND REPAIR

A. Clean and repair existing materials that remain or are to be reused.

3.05 INSTALLATION

A. Install relocated materials and equipment.

END OF SECTION

SECTION 27 05 26
GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding clamps
B. Splice
C. Grounding lugs
D. Telecommunications bonding backbone
E. Cable tray bonds
F. Wall-mount busbars
G. Rack mount grounding strip

1.02 RELATED SECTIONS

A. Specification Section 26 0526 - Grounding and Bonding for Electrical System
B. Specification Section 27 0528 - Pathways for Communication Systems
C. Specification Section 27 1005 - Telecommunications Cabling Infrastructure

1.03 REFERENCES

A. ANSI/NFPA-70-version as adopted - National Electrical Code (NEC)
B. ANSI/IEEE Std. 1100-version as adopted - Recommended Practice for Powering and Grounding Electronic Equipment
C. TIA-607-B Telecommunications Grounding (Earthing) and Bonding for Customer Premises
D. ANSI/TIA-606-B Administration Standard for Telecommunications Infrastructure
E. NECA/BICSI 607-version as adopted - Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings

1.04 SUMMARY

A. Provide a communications bonding and grounding system as described within this specification and drawings. System shall be in compliance with the above cited Codes, Standards and Agencies.
B. Comply with the requirement for Section 26 0526 - Grounding and Bonding for Electrical System.
C. Bond the following items within the telecommunications grounding system:
    1. All communications system active equipment.
    2. All PDU and surge protection equipment.
    3. Metallic raceway systems, including metallic cable trays.
    4. Communications equipment enclosures (cabinets) or cross-connect frames.
    5. Broadband passive devices.
    6. Metallic splice cases.
    7. Metallic cable screens, armor or shields.
    8. All metal cable conduit.
    9. Electrical service panels in entrance facilities, telecommunications and equipment rooms.
    10. Wall and rack mounted grounding busbars.
    11. Exposed building steel that is within 6 feet of equipment racking systems.
    12. Building steel extending to earth in outside-plant.
    13. All related bonding accessories.

1.05 QUALITY ASSURANCE

A. Qualifications:
   1. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
   2. Grounding to conform to applicable building codes.
   3. Methods of construction that are not specifically described or indicated in the contract documents to be subject to the control and approval of the owner or their official representatives.
   4. Equipment and materials specified shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed.
   5. Where “approved equal” is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to written approval by the owner per the substitution policy listed within these specifications.
   6. Materials and methods shall comply in every way with above cited Standards and Codes.

1.06 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years.
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents.
   4. Have options clearly indicated as applicable to each submittal.

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings. Include electrical characteristics and connection requirements.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable building code for requirements applicable to work specified herein.

1.08 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact. Deliver items in their original factory shipping cartons.

B. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

1.09 APPROVED MANUFACTURERS

A. Panduit

B. Chatsworth Products, Inc.

C. Hoffman

D. Engineer approved equal.

PART 2 PRODUCTS

2.01 GROUNDING CLAMPS

A. Pipe Clamps:
   1. Used to ground copper code conductor to water pipe or copper tubing.
   2. Cast from high strength, electrolytic bronze to provide reliable grounding connections.
   3. Plated steel screws provide high strength and inhibit corrosion.
   4. Accommodates a wide range of pipe, tube, rod and conductor sizes.
   5. UL 467 Listed for grounding and bonding with AWG conductor.

B. Bronze Grounding Clamps for Conduit:
   1. Used to ground copper code conductor parallel to, or at a right angle to a rod, tube, or pipe.
   2. Made from high strength, electrolytic cast bronze.
   3. Accommodates a wide range of pipe, tube, rod and conductor sizes.
   4. UL 467 Listed for grounding and bonding with AWG conductor and suitable for direct burial in earth or concrete.

C. Bronze Grounding Clamps with Lay-in Feature:
   1. Bonds water pipe to continuous copper grounding conductors.
   2. Made from high strength, electrolytic cast bronze.
   3. Bronze hardware provides long term reliable assembly.
   4. UL 467 Listed for grounding and bonding with AWG conductor and suitable for direct burial in earth or concrete.

D. Zinc Ground Clamp:
   1. Bonds steel and aluminum pipe to aluminum conductors.
   2. Made from die cast zinc.
   3. Zinc plated steel hardware.
   4. UL 467 Listed for grounding and bonding.

E. Universal Beam Grounding Clamp:
   1. For bonding structural steel such as I-Beams into bonding network.
   2. Universal, fits on a wide range of standard (angled) and wide flange (parallel) structural steel beams.
   3. Provide a mounting pad suitable for a two-whole compression lug.
   4. Installs quickly and easily with standard ¼" key hex wrench tooling.
   5. UL 467 Listed and CSA 22.2 Certified for grounding and bonding suitable for direct burial in earth or concrete.
   6. Comply with vibration tests per MIL-STD-202G.

2.02 SPLICE

A. Compression-type Aluminum-to-Copper Reducing Splice:
   1. Dual rated for use with aluminum or copper conductors.
   2. Factory pre-filled with joint compound and sealed with easy pull-out end plug to inhibit corrosion.
   3. Color-coded end plug and die index numbers marked on barrel for proper crimp die selection.
   4. Tin-plated to inhibit corrosion.
   5. For use up to 35KV and temperature rated 90 degree C when crimped with manufacturer rated crimping tools and dies.

B. Code/Flex Conductor H-TAPs:
   1. Used as a splice, or to tap smaller conductors into larger continuous conductors.
   2. Each HTAP terminates a wide range of conductor sizes and combinations of code and flex conductors Class G, H, and I to suit a variety of applications.
   3. Tap grooves are separated from one another, allowing them to function independently so HTAP can be used with single or multiple conductors, providing maximum design and installation flexibility.
   4. Color coded and marked with manufacturer die index numbers for proper crimp die selection.
   5. UL Listed and CSA Certified, with wide size range of conductor sizes and rated for applications up to 600V when crimped with manufacturer rated tools and dies.
   6. Tin plated to inhibit corrosion.

C. Code Conductor, Thin Wall, Tin -plated C-TAP:

1. For copper-to-copper splicing or pigtail tap splicing.
2. Wide wire range-taking capability minimizes inventory requirements.
3. Color-coded for proper crimp die selection.
4. Ribbed design provides high strength.
5. Made from high conductivity wrought copper.
6. Tin-plated to inhibit corrosion and oxidation.
7. UL Listed and CSA Certified, with wide size range of conductor sizes and rated for applications up to 600V when crimped with manufacturer rated tools and dies.

2.03 GROUNDING LUGS

A. Copper and Aluminum One-Hole Grounding Lay-in Lug for Bonding Ladder Rack:
   1. Used for quick installation of a continuous grounding conductor.
   2. UL 467 Listed for grounding and bonding, copper lugs. UL Listed for direct burial in earth or concrete.
   3. UL 467 Listed for use up to 600V and temperature rated 90 degree C.

B. Two-hole, Long-barrel Copper Compression Lugs for Grounding Conductors:
   1. Meets TIA-607-B requirements for network systems grounding applications.
   2. Tested by Telcordia - meets NEBS Level 3 with AWG conductor.
   3. For use up to 35KV and temperature rated 90 degree C when crimped with manufacturer rated crimping tools and dies.
   4. Color-coded barrels marked with manufacturer’s die index numbers for proper crimp die selection.
   5. Have long barrel to maximize number of crimps and provides premium wire pull-out strength and electrical performance.
   6. Have “inspection window” over tongue to visually assure full conductor insertion.
   7. Be tin-plated to inhibit corrosion.
   8. Available with NEMA and BISCI hole-sizes and spacing.

2.04 TELECOMMUNICATIONS BONDING BACKBONE (TBB) GROUNDING CONDUCTORS

A. To be bare or insulated copper, of minimum conductor size #6 AWG and sized at 2 kcmil per linear foot up to a maximum of 750 kcmil. For details on TBB sizing see “Execution” section at end of this document.

B. Where un-insulated, to be identified with green tape at termination location.

C. Labeled in accordance with recommendations set forth in ANSI/TIA-606-B Administration for Telecommunications Infrastructure.

2.05 CABLE TRAY BONDS

A. Split Bolt for Bonding Cable Trays:
   1. Made from high strength copper alloy to resist corrosion and provide premium electrical and mechanical performance.
   2. Wire range-taking capability.
   3. Nut hex provides correct fit with socket, box, or open end wrenches resulting in proper torquing of electrical connection.
   4. Pressure bar provides secure connection on a full range of conductor combinations used with each connector assuring premium wire pull-out strength.
   5. UL Listed and CSA Certified with AWG conductor for use up to 600V and temperature rated 90 degrees C.
   6. Available in tin-plated version for bonding to galvanized wire baskets and tray.

B. Auxiliary Cable Brackets:
   1. Used for mounting telecommunications bonding conductors outside of cable tray.
   2. Maintain 2” separation between bonding conductors and all other types of cabling per TIA 607-B.

3. Bonds ladder rack, wire basket sections together without drilling holes or applying other split-bolt clamps.
4. Supports grounding conductors in the telecommunications room, allows separation of grounding conductors from other cables.
5. Holds up to four conductors in sizes up to 750 kcmil.
6. Bonds to all 1” and 2” ladder rack rails.
7. Pain piercing teeth provide electrical continuity between cable pathway sections while minimizing debris.
8. Front and back mounting screw options to allow easy visual inspections.
9. Can be mounted above or below the cable pathway system for flexibility.

2.06 WALL MOUNT BUSBARS (TMGB/TGB)

A. Meet BICSI and TIA-607-B requirements for network systems grounding applications.

B. Employ BICSI hole spacing to 2-hole lugs.

C. Be made of high conductivity copper and tin-plated to inhibit corrosion.

D. Come pre-assembled with brackets and insulators attached for quick installation.

E. Use labels to identify busbars to meet TIA/EIA-606-A.

2.07 RACK MOUNT GROUNDING STRIP

A. Provide clean bond to any rack mounted equipment regardless of whether or not equipment has an integrated grounding terminal.

B. EIA Universal hole pattern.

C. Provide length required to bond up to 45 RU per rack.

PART 3 EXECUTION

3.01 GENERAL

A. It shall be the responsibility of this contractor to adapt the following general guidelines and principles for the requirements of the actual environments where the grounding and bonding systems are to be implemented.

B. System shall provide equipment ground connections (bonds) from the premises entrance facility and outside-plant earthing system to each telecommunication room ground busbar, through the racking systems to bond the network equipment.

C. Entire grounding link from equipment to earth should be visually verifiable except where hidden by walls, conduit or pathways.

D. Installing contractor shall label all elements of the communications bonding network according to guidelines defined in TIA-607-B and ANSI/TIA 606-B.

E. It is the responsibility of the installer to be knowledgeable of all previously cited Standards and Codes and to bring to the attention of the engineer any conflicts discrepancies to achieve a fully functioning, standards-compliant earthing system.

3.02 TELECOMMUNICATIONS BONDING BACKBONE (TBB)

A. Bonding and grounding conductors may be insulated or un-insulated and shall not decrease in size as the grounding path moves closer to earth.

B. Connections (bonds) between the telecommunications grounding network and associated electrical panels shall be done by a qualified electrician in accordance with guidelines in TIA 607-B and applicable electrical codes.

C. Bonding Conductors should be continuous and routed in the shortest possible straight line path, avoiding changes in elevation and sharp bends.

D. TBB conductors shall be protected from mechanical damage and built so as to minimize splicing. Where splicing is unavoidable they shall be done using irreversible compression

splices (C-TAPS) built to that purpose. See the Materials section of this document for appropriate compression splices.

E. TBB in multi-story buildings with multiple risers shall employ a grounding equalizer (GE) between vertical grounding backbones at the top floor of the building and minimally at every third floor in between to the lowest floor level. The GE shall be no smaller than the largest sized TBB.

F. Routing grounding conductors through ferrous metal conduit should be avoided, but if it is necessary due to building constraints, any grounding conductor running through ferrous conduit longer than 3 feet shall be bonded at the end using appropriately sized HTAP.

G. Conductors used to bond TBB to conduit ends shall be of #6 AWG size or larger.

H. Provide appropriately sized TBB conductor using the pathway distances and the chart found in TIA 607-B.

3.03 TELECOMMUNICATIONS ROOMS AND TELECOMMUNCATIONS GROUNDING BUSBAR (TGB)

A. Each telecommunications room shall have its own TGB to which equipment and dead steel in that room are bonded.

B. The TGBs shall be sized according to the anticipated number of bonded connections needed.

C. TGBs shall have tinned surfaces to restrain oxidation and shall be cleaned and have an antioxidant paste applied to both bonding surfaces prior to fastening conductors.

D. Connectors on backbone and rack/cabinet bonding conductors which attach to TGB shall be of two-hole, long barrel compression lugs as specified in the Materials section of this document.

E. Building steel within six feet of the communications grounding system shall be bonded into the system with beam clamps and other hardware appropriate to that purpose.

F. Racks and cabinets shall have individual Rack Bonding Conductors bonding to the Telecommunications Equipment Bonding Conductor. **Daisy chaining or serial connections of one rack or cabinet to another will not be accepted.**

G. Rack Bonding Conductors or above rack row grounds (TEBC) shall be installed to maintain a minimum of 2” separation from all other types of cable - power or communications.

H. To maintain this segregation of cables some telecommunications rooms may lend themselves to the installation of Auxiliary Conduct Brackets for routing bonding conductors outside of, yet parallel to ladder rack or basket tray.

I. Bonding conductor support systems like auxiliary brackets shall be spaced no further apart than three foot intervals.

J. All cables containing metallic shielding or armor shall be properly bonded into the communications grounding system using the appropriately sized grounding kit from an approved manufacturer.

3.04 BONDING WITHIN RACKS AND CABINETS

A. Racks and cabinets shall be bonded into the communications bonding network with conductors of #6 AWG or larger.

B. Depending on size of the telecommunications room, rack bonding conductors (RBC) may tap into underfloor or overhead grounding conductors, or for smaller TRs (3-5 racks or cabinets), may go directly from the rack to the wall mounted busbar.

C. Racks, cabinets and similar enclosures shall not be attached serially but must have individual RBC into the grounding system.

D. Newly installed racks and cabinets shall have vertical grounding busbars installed along one rail to provide clean bonding landing point for all rack mounted equipment. Grounding busbars shall not be isolated from the rack or cabinet.

E. All painted components of racks/cabinets shall be assembled using serrated grounding washers and thread-forming screws to ensure electrical continuity between the different structural components of the rack/cabinet.

F. Larger equipment with integral grounding terminals or pads shall be bonded to the vertical busbar with equipment grounding kits attached to those terminals and bonding them to the rack-mounted busbars.

G. Anywhere two metallic surfaces are to be bonded, contractor shall clean the contact areas of paint or oxidation using abrasive pads, and apply film of anti-oxidation compound between surfaces prior to bonding.

H. All cable fittings shall be of two-hole compression-type. Mechanical screw-lugs on racking systems will not be accepted and must be removed and replaced at contractor's expense.

I. All screws used to affix compression lugs to rack-mounted vertical busbars shall be of the thread forming type made specifically for electrical bonding.

J. Smaller equipment not having integral grounding pads must be bonded to the rack through the equipment mounting flanges using green thread-forming grounding screws with serrations under the head to cut through pain, coatings and oxidation that may be present on the equipment flange. Such equipment shall have minimally one grounding screw per piece of equipment.

3.05 FIELD QUALITY CONTROL

A. On installations confined to a single telecommunications room, the installing contractor shall visually verify continuity of communications bonding system from equipment, through racking systems, to overhead underfloor backbone to the wall mounted busbar in that telecommunications room.

B. Contractor shall further verify the use of all appropriate bonding accessories in the racking systems such as grounding washers and thread-forming grounding screws.

C. Installation of a building-wide telecommunications backbone, installing contractor is further responsible for visually verifying sizing and sound installation of the telecommunications bonding backbone including presence of properly sized and installed grounding equalizer conductors between backbones contained in separate risers.

D. Inspecting contractor shall verify that any conduit larger than 3 feet through which a grounding conductor passes is properly bonded to the grounding conductor as described in this document.

E. During inspections contractor shall verify compliance with all stipulations specified in this document and compliance with all regulatory references cited.

F. All openings or gaps in the bonding system during inspections will be recorded in the inspection report and remedied.

G. During inspections, contractor shall check all grounding and bonding system conductors and connections for tightness and proper installation, including checking proper dies were used on compression taps and fittings by checking embossed die numbers on those connections.

END OF SECTION

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SECTION 27 05 28
PATHWAYS FOR COMMUNICATION SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Termination backboards

B. Basket Type Cable Tray

C. Ladder Type Cable Tray

D. Thru-Wall Fire Stop Fitting

1.02 RELATED SECTIONS

A. Specification Section 26 0529 - Hangers and Supports for Electrical Systems

B. Specification Section 26 0533 - Raceway And Boxes for Electrical Systems

C. Specification Section 27 0526 - Grounding and Bonding for Communications Systems

D. Specification Section 27 1005 - Telecommunications Cabling Infrastructure

1.03 REFERENCES

A. EIA/TIA-568B - Commercial Building Wiring Standard

B. EIA/TIA-569B - Commercial Building Standard for Telecommunication Pathways and Spaces

C. NFPA 70 - National Electrical Code

1.04 SUBMITTALS

A. All submitted documents shall be:
   1. Digital (scanned documents are not acceptable)
   2. Current, within last 5 years.
   3. Complete and in sufficient detail to allow ready determination of compliance with contract documents.
   4. Have options clearly indicated as applicable to each submittal.

B. Construction submittal
   1. Provide (1) submittal including all products listed in this specification section. Provide the following for each product.
      a. Product Data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings. Include electrical characteristics and connection requirements.

1.05 SYSTEM DESCRIPTION

A. Pathway: Conform to EIA/TIA 569B, using raceway as indicated.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

PART 2 PRODUCTS

2.01 TERMINATION BACKBOARDS

A. Material: Plywood.

B. Size: 4' x 8', 3/4 inch thick.

C. Grade: Fire-retardant, AC grade with "C" grade applied to wall.

D. Painted on all sides and edges with fire resistant paint, (Sherwin Williams MIL-PRF-24596B).

E. Apply at location as shown on drawings.

2.02 BASKET TYPE CABLE TRAY

A. Welded steel wire mesh cable tray. Electro plated zinc coated finish.
   1. Cablofil CF ##
   2. xtray
   3. Cat-Tray
   4. Basor
   5. Cope
   6. Engineer approved equal.

B. Provide manufacturer's standard clamps, hangers, brackets, splice plates, connectors, and grounding straps.
   1. All vertical to horizontal cable tray transitions shall be supported with waterfall dropout kits.
   2. All cable transitions between cable trays shall be supported with appropriate manufacturer
   3. hardware. Basis of design parts:
      a. Cablofil FAS U -Universal Bracket ##" horizontal wall bracket FASU ### BL black
      b. Cablofil FAS P- Profile bracket ##" vertical wall bracket FASP ### BL black
      c. Cablofil SWK - Splice Washer Kit SWK BL black
      d. Cablofil FASLOCK-Splice FAS LOCK S* BL black
      e. Cablofil RAD T 90 - RAD T 90 KIT
      f. Cablofil Single Hanger Suspension Bracket for ##" basket from ceiling SAS BL black
      g. Cablofil Basket Tray waterfall CABLEXIT100 BL black
      h. Cablofil Grounding Lug for basket tray GNDSB
      i. Cablofil Drop out kit DROPOUT KIT BL black
      j. Cablofil Splice Bar ED275

C. Install tray using trapeze style all thread and unistrut system. Coordinate installation with all trades. Contractor shall seek approval prior to wall mount installations.

D. No copper data cabling is to be run in same space as powered cable such as, but not limited to, coaxial television distribution, speaker cable, or fire alarm.

E. All tray is to maintain manufacturer approved fill capacities. Contractor shall verify all fill capacities, any discrepancies shall be brought to engineers attention prior to ordering.

2.03 LADDER TYPE CABLE TRAY

A. Steel tube ladder section cable tray 12" wide with cross members at 12".
   1. Chatsworth
   2. Middle Atlantic
   3. Cooper B-line
   4. Basor
   5. Cope
   6. Engineer approved equal.

B. Provide manufacturer's standard clamps, hangers, brackets, splice plates, connectors, and grounding straps.
   1. All vertical to horizontal cable tray transitions shall be supported with waterfall dropout kits.
   2. All cable transitions between cable trays shall be supported with appropriate manufacturer hardware.

C. Install tray using manufacturer's wall support kits.

D. No copper data cabling is to be run in same space as powered cable such as, but not limited to, coaxial television distribution, speaker cable, or fire alarm.

E. All tray is to maintain manufacturer approved fill capacities. Contractor shall verify all fill capacities, any discrepancies shall be brought to engineers attention prior to ordering.

F. Contractor shall plan for all major transitions out of the ladder and navigating corners.

G. Transitions shall use necessary hardware such as drops and spools to protect bend radius of cabling.

2.04 THRU-WALL FIRE STOP FITTING

A. Manufacturers:
   1. Specified Technologies EZ-Path
   2. Engineer approved equal.

B. Thru-wall fire stop device for use in through-penetration fire stop system, examined and tested by Underwriters Laboratories Inc. to UL1479 and bears U.S. UL Classification Mark. Device shall be classified for use in one, two, three, and four hour rated gypsum, concrete, and block walls and provided with a maximum "L" rating of 6 CFM.

C. Box is to be constructed of 16 AWG G90 steel. Provide with adjustable doors.

D. Provide with grounding lug. Maintain ground continually through all devices.

E. See plans for sizes, quantities and placements.
   1. Utilize five (5) ganged pathway bracket in all telecommunications rooms, part number EZP544W.
   2. Provide five (5) EZD44S Pathways at each bracket.
   3. Provide EZ pathway equivalent to cable tray capacity at fire wall penetrations.

PART 3 EXECUTION

3.01 GENERAL INSTALLATION

A. Support raceways, backboards and cabinets.

B. Install termination backboards and cabinets plumb, and attach securely to building wall at each corner.

C. Install polyethylene pulling string in each empty conduit over ten feet (10') in length or containing a bend.

D. This contractor shall provide blank cover plates for all indicated telephone and computer outlets.

E. All conduit sizes shall be verified with the owner prior to installation.

F. Provide conduit with box from each outlet location to above nearest accessible ceiling.

G. Conduit serving mechanical equipment low voltage cabling shall be 3/4" or larger.

H. Conduit serving category network cabling shall be 1" or larger.

I. Conduit serving audio visual system cabling shall be 1-1/4" or larger.

J. This contractor is to install if they are licensed to, or contract with a licensed electrician to install conduit serving low voltage cables located in all mechanical rooms and non-accessible areas and exposed structural areas. Use cable trays in other areas as indicated on the drawings. Where cable trays are not accessible, use J-hooks equal to Cablofil or Caddy Cable CAT. No cable shall be allowed to lie on accessible ceilings tiles.

K. Provide sleeves between walls and accessible clouds. Provide hooks with closure holes. Mount hooks 3 feet on center.

3.02 CABLE TRAY INSTALLATION

A. All tray is to be sized not to exceed 40% total tray fill capacities. Contractor shall verify all fill capacities, any discrepancies shall be brought to engineers attention prior to ordering.

B. Install metallic cable tray in accordance with NEMA VE 1.

C. Support cable trays in accordance with Specification Section 26 0529 - Hangers and Supports for Electrical Systems. Provide supports at each connection point, at the end of each run, and at other points as recommended by the manufacturer.

D. Provide continuity between tray components.

E. Use anti-oxidant compound to prepare aluminum contact surfaces before assembly.

F. Provide #6 AWG bare copper equipment grounding conductor through entire length of tray; bond to each component.

G. Connections to tray may be made using mechanical or exothermic connectors.

H. Cable tray installation shall be coordinate between all project trades. Provide cable tray offsets as required. If issues of coordination arise, project architect and engineer shall determine final use of ceiling space for all trades affected.

I. Cable tray shall not be installed more than 24" above an acoustical tile ceiling.

J. Cable tray shall have a minimum of 12" of headroom above the tray and 18" of clearance on the side of the tray for access.

K. Cable tray shall be trapeze suspended in all hallways.

END OF SECTION

SECTION 27 10 05
TELECOMMUNICATIONS CABLING INFRASTRUCTURE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Backbone optical fiber

B. Horizontal copper

C. Patch panels

D. Optical fiber distribution panel

E. Work area outlets

F. Optical fiber connectors

G. Grounding and bonding products

1.02 SUMMARY

A. Work included, but not limited to:
   1. Data network backbone cable installation
   2. Data network horizontal cable installation
   3. Data wiring closet setup
   4. Infrastructure cabling management
   5. Data patch cables
   6. Ground and bonding
   7. Testing requirements

1.03 GENERAL REQUIREMENTS

A. The drawings and specifications indicate the intent and direction of the installation. Items and their location are shown diagrammatic and are to be field verified by the cabling contractor prior to completing work associated with the item.

B. All cabling work shall be performed in strict accordance with all applicable laws, ordinances, codes of local, state and federal government, or other authorities having lawful jurisdiction. The cabling contractor is required to verify all requirements.

C. The cabling contractor shall furnish all required labor, material, and associated tools to facilitate the installation of all the infrastructure cables and associated items specified herein and with respect to the infrastructure design drawings without damage to the cables, associated items, and/or facilities.

D. Qualified personnel, utilizing state-of-the-art equipment and techniques shall complete all installation work.

E. All cables routed outside of the cable runway installed shall be properly supported.

F. All wall and/or floor penetrations shall be via metal conduit sleeves properly sized, supported and fire stopped.

G. All materials shall be installed in accordance with the manufacturer's specified recommendations and practices.

1.04 QUALITY ASSURANCE

A. Standards: All telecommunications wiring, cabling devices, and other associated items and work shall conform to the most recent requirements of the following codes, standards, and organizations where applicable:
   1. American National Standards Institute (ANSI)
   2. Electronic Industries Association (EIA)
   3. Federal Communications Commission (FCC)
   4. Institute of Electrical and Electronic Engineers (IEEE)
   5. International Organization for Standardization (ISO)

6. National Electric Code (NEC)
7. National Fire Protection Association (NFPA)
8. BOCA National Building Code
9. Underwriter's Laboratories (UL)
10. Telecommunications Industry Association (TIA)
11. Building Industry Consulting Services International (BICSI)
12. Society of Cable Telecommunications Engineers (SCTE)

B. The copper data infrastructure cable system shall have a manufacturer's material and labor performance certification for the installed cable and components. The certification shall be that UTP Category 6 cabling infrastructure will perform to TIA's specifications for that Category. A manufacturer's written certification document shall be submitted at the completion of the project.

C. A matched solution shall be provided end-to-end for all cabling infrastructure. No third party components shall be provided unless otherwise noted elsewhere in the project specification or drawings.

D. The installer must be able to provide a warranty to the owner. Duration of the warranty shall be a minimum of ten years from the date of project completion and acceptance. It shall cover all of the product as well as their performance for the warranty period.

E. The cabling contractor shall be in business for a minimum of five (5) years.

F. The contractor must be registered with BICSI and have at least one Registered Communications Distribution Designer (RCDD) on full-time staff. Provide copy of certificate with submittals.

G. The contractor must possess current liability insurance certificates.

H. Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the components and accessories for each cable type specified, 30 days prior to the proposed test date. Include procedures for certification, validation, and testing.

1.05 SUBMITTALS

A. The cabling contractor shall not begin any installation of materials that require a material fact sheet and/or sample to be submitted and approved by the project engineer. If material is installed prior to approval, the bidder is liable for the cost of removal and replacement if the material is not approved.

B. All submitted documents shall be:
1. Digital (scanned documents are not acceptable)
2. Current, within last 5 years.
3. Complete and in sufficient detail to allow ready determination of compliance with contract documents.
4. Have options clearly indicated as applicable to each submittal.

C. Construction submittal
1. Provide (1) submittal including all products listed in this specification section and any other material not listed but required for proper installation. Provide the following for each product.
   a. Product Data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings. Include electrical characteristics and connection requirements.
   b. Installation Instructions indicating support and hanging details, and service clearances required.
   c. Certifications -

1) Provide both the manufacturer's certification for all installers and technicians that will have a role in this project as well as all BICSI certifications as outlined in the sections above.
2) Provide Fluke or approved network cable tester calibration certification.

D. Closeout submittal
1. After project substantial completion, provide (1) submittal including all products listed in this specification section. Provide the following for each product.
a. Warranty documentation, fully filled out and including start-up and start date information.
b. Test Results. A record of installed cable shall be provided in accordance with TIA/EIA-606. The cable records shall include only the required data fields in accordance with TIA/EIA-606. Include manufacture date of cable with submittal.
c. Red Line Drawings - A completed set of drawings indicating the general cable routing of the backbone cables and the primary routes of the horizontal cables shall be provided. Also indicate all wall and floor sleeves utilized. The drawings for this information shall be a non-working, clean set of drawings. Handwritten drawings shall not be allowed.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The cabling contractor shall coordinate all delivery, storage and handling concerns with the general contractor.

B. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for telecommunications cabling and equipment placed in storage.

1.07 APPROVED CABLING VENDORS

A. All fiber and connectivity products provided by the structured cabling contractor shall be a complete end-to-end system warrantied by the fiber manufacturer.

B. All category cable and connectivity products provided by the structured cabling contractor shall be a complete end-to-end system warrantied by the cable manufacturer.

1.08 JACKET TYPE

A. As per NEC, this building is to have plenum-rated cable and products used exclusively. No “non-plenum” parts shall be installed.

1.09 COLORS

A. The owner shall determine all colors of cables, jack inserts, and other visible components during the submittal process from the standard colors available by each individual manufacturer. No custom colors will be used.

PART 2 PRODUCTS

2.01 BACKBONE OPTICAL FIBER

A. Single Mode Fiber Optic Cabling
1. Provide OS2 plenum rated 12-strand tight buffered fiber optic cabling from the main distribution frame to each intermediate distribution frame.
a. Corning
b. Commscope
c. Belden]
d. Berk-Tek
e. OCC
f. Superior Essex
g. Engineer Approved Equal
2. Quantity: Refer to the drawings for further information.

2.02 HORIZONTAL COPPER

A. Category 6 Data and Voice:

1. Provide unshielded Twisted Pair (UTP), Category 6 4/pair, 23 AWG to locations identified on the plans.
    a. Panduit - TX6500
    b. Commscope Uniprise - UltraMedia 7504
    c. Belden - Data Twist 3600
    d. BerkTek - LANmark 1000
    e. Superior Essex - DataGain 6+
    f. Engineer approved equal
    g. Cabling shall be also provided to each video surveillance camera shown on the plans unless otherwise noted.
    h. Color to be determined by the owner.

B. Patch Cables - Data Racks (Copper):
1. Provide pre-connectorized copper patch cables that match performance and configuration of horizontal data and voice cabling. Length as required for installation per BICSI standards.
2. Quantity: Structured cabling subcontractor shall provide sufficient patch cords for 75% of horizontal cable runs. For bidding purposes, use an average cord length of 10 feet for patch cords.
3. Color and exact length shall be determined by the owner.

2.03 PATCH PANELS

A. Data and Voice:
1. Modular 24 or 48 position, 19 inch rack, 1U or 2U, UTP patch panel. Panel to meet performance standards of horizontal cabling manufacturer. Patch panel bracket shall accept RJ45 modular jacks that are utilized at the work area outlet.
    a. Product shall be a matched solution from cabling manufacturer
    b. Quantity as needed for all connections in contractor plus 25% at each rack for future growth.

2.04 OPTICAL FIBER DISTRIBUTION PANEL

A. Panel shall be a rack mounted optical fiber distribution panel constructed utilizing a minimum of 18 gauge steel. Panel shall be divided into two sections, distribution and user. Distribution section shall have strain relief, routing guides, splice tray and shall be lockable. The user section shall have a cover for patch cord protection. Each panel shall provide fusion spliced pigtails and adapters. Provide adapters as LC type.
1. Product shall be a matched solution from cabling manufacturer.
2. Mechanical terminated ends shall not be allowed.

B. Provide pre-connectorized fiber patch cables with matching connectors as specified. Patch cords shall meet same performance requirements as backbone fiber optic cabling. Length as required for installation per BICSI standards.
1. Product shall be a matched solution from cabling manufacturer.

2.05 WORK AREA OUTLETS

A. Work Area Data/Voice Jacks:
1. Jacks shall be modular RJ-45 style and meet performance requirements of horizontal cabling.
    a. Product shall be a matched solution from cabling manufacturer.

B. Work Area Outlet Cover Plate:
1. Telecommunications cover plates shall comply with TIA-568-C.1 and shall be constructed of high impact thermoplastic material and match the style and color of receptacles and switch cover plates. Provide any blank inserts as required for all unused openings. Device cover plates shall be coordinated with architect during submittal review. Coordinate with each space prior to ordering.
    a. Product shall be a matched solution from cabling manufacturer.

C. Voice Wall-Mounted Outlet:
   1. Provide stainless steel phone faceplate with steel screw terminals and information outlet capable of RJ45 connection to normal phone.
      a. Product shall be a matched solution from cabling manufacturer.

2.06 OPTICAL FIBER CONNECTORS

A. Optical fiber connectors shall all be of the LC fusion splice pigtail style unless noted elsewhere.

2.07 GROUNDING AND BONDING PRODUCTS

A. Provide in accordance with UL 467, TIA J-STD-607, and NFPA 70. Components shall be identified as required by TIA/EIA-606. Provide ground rods, bonding conductors, and grounding busbars as specified in specification section 27 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

PART 3 EXECUTION

3.01 GENERAL

A. The drawings and specifications are considered to reflect the intent and direction for a complete data cable system.

B. Quantities shown are for general information and may be incorrect. The bidder is to verify all quantities and is to report any count differences to the engineer prior to submission of their installation response. The cabling contractor will be held responsible for all required quantities to complete the project to the intent and direction of the drawings and specifications.

C. Material description and manufacturer's part numbers are shown. The cabling contractor is expected and has the responsibility to verify that the part number matches the description. Any discrepancy is to be noted to the engineer prior to response submittal. The cabling contractor is responsible for the correct materials being furnished and installed.

D. Install telecommunications cabling and pathway systems, including the horizontal and backbone cable, pathway systems, telecommunications outlet/connector assemblies, and associated hardware in accordance with TIA-568-C.1, TIA-568-C.2, TIA-569, NFPA 70 and UL standards as applicable. Provide cabling in a star topology network. Pathways and outlet boxes shall be installed as specified in specification section 26. Install telecommunications cabling with copper media in accordance with the following criteria to avoid potential electromagnetic interference between power and telecommunications equipment. The interference ceiling shall not exceed 3.0 volts per meter measured over the usable bandwidth of the telecommunications cabling.

E. Install UTP and optical fiber telecommunications cabling system as detailed in TIA-568-C.1. Screw terminals shall not be used except where specifically indicated on plans. Use an approved insulation displacement connection tool kit for copper cable terminations. Do not exceed manufacturers' cable pull tensions for copper and optical fiber cables. Provide a device to monitor cable pull tensions. Do not exceed 25 pounds pull tension for four pair copper cables. Do not chafe or damage outer jacket materials. Use only lubricants approved by cable manufacturer. Do not over cinch cables, or crush cables with staples. For UTP cable, bend radii shall not be less than four times the cable diameter. Cables shall all be terminated. There shall be no cable with unterminated elements. Cabling shall be continuous with no splices. Label cabling in accordance with paragraph titled LABELING.

F. This contractor is to install if they are licensed to, or contract with a licensed electrician to install conduit serving low voltage cables located in all mechanical rooms and non-accessible areas and exposed structural areas. Use cable trays in other areas as indicated on the drawings. Where cable trays are not accessible, use J-hooks equal to Cablofil or Caddy Cable CAT. No cable shall be allowed to lie on accessible ceilings tiles.

G. Provide sleeves between walls and accessible clouds. Provide hooks with closure holes and cable ties. Mount hooks 3 feet on center.

3.02 HORIZONTAL CABLING

A. Install horizontal cabling as indicated on drawings. Do not untwist Category 6 UTP cables more than one half inch from the point of termination to maintain cable geometry. Provide slack cable in the form of a figure eight (not a service loop) on each end of the cable, 10 feet in the telecommunications room, and 12 inches in the work area outlet.

3.03 TELECOM ROOM CABLING

A. Neatly comb, bundle, and manage all cabling in groups of 24.

B. Provide appropriate accessories and transitions to manage cabling while maintaining manufacturer recommended bend radii and support with Velcro straps as necessary.

3.04 PATHWAYS

A. Provide in accordance with TIA-569 and NFPA 70. Provide building communications cabling pathway as specified in Section 26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS and Section 27 0528 PATHWAYS FOR COMMUNICATION SYSTEMS.

3.05 WORK AREA OUTLETS

A. Terminate UTP cable in accordance with TIA-568-C, TIA-568-C.2 and wiring configuration as specified. All fiber optic cabling shall be terminated in accordance with TIA-568-C.3. Follow manufacturer's installation guidelines for all specific requirements related to work area outlet termination.

3.06 COVER PLATES

A. As a minimum, each outlet shall be labeled as to its function and a unique number to identify cable link in accordance with the section titled LABELING.

3.07 PULL CORDS

A. Pull cords shall be installed in conduit serving telecommunications outlets that do not have cable installed.

3.08 PATCH PANELS

A. Patch panels shall be mounted in equipment racks with sufficient ports to accommodate the installed cable plant plus 25 percent spares. Copper entering a patch panel shall be secured to the panel as recommended by the manufacturer to prevent movement of the cable.

3.09 EQUIPMENT RACKS, BRACKETS AND CABINETS

A. All equipment racks, brackets and cabinets hosting telecommunications equipment shall all be installed in accordance with the manufacturer's recommendations. Permanently anchor all racks to the floor.

3.10 GROUNDING AND BONDING

A. Provide in accordance with TIA J-STD-607, NFPA 70 and as specified in Section 26 0526 GROUNDING & BONDING FOR ELECTRICAL SYSTEMS.

3.11 LABELING

A. Provide labeling in accordance with TIA/EIA-606. Handwritten labeling is unacceptable. Stenciled lettering for voice and data circuits shall be provided using either thermal ink transfer or laser printing.

B. Cables shall be labeled using color labels on both ends with identifiers in accordance with TIA/EIA-606.

C. Workstation outlets and patch panel connections shall be labeled using color coded labels with identifiers in accordance with TIA/EIA-606.

3.12 WIRELESS SYSTEM - POST INSTALL

A. The environment shall be reliant on the stability, performance and facilities-wide coverage of this new wireless network. It shall be this contractor’s responsibility to perform a post-

installation signal strength test to verify complete coverage is being provided in each of the new project areas.

B. The wireless system coverage report may result in some adjustments to the wireless access point layout. This contractor shall assist in a one-time device relocation to achieve full coverage, so far as the installed cable will allow.

C. No hand-written test results will be accepted.

3.13 CABLE TESTING

A. General: Cables are to be tested after installation is complete with Fluke DSX(Versiv) tester or equivalent and delivered in electronic format for engineer review. If for any reason, the drop location, raceway and/or drop location box is removed for additional work of any nature, the drop location is to be re-tested if previously tested. All cables associated with the drop location are to be re-tested. The cost of re-testing is the responsibility of the cabling contractor.
   1. The field-test instrument shall be within the calibration period recommended by the manufacturer, typically 12 months.

B. Fiber Optic Cable
   1. Each strand in fiber optic cable shall be tested for correctness of termination, overall transmission loss, and defects using an approved Optical Time Domain Reflectometer (OTDR) and a power meter. The engineer shall have the option to be present during testing. Notify the engineer one week prior to testing.
   2. Pre-terminated fiber solutions shall be tested by factory providing termination. Field testing is not required.
   3. Testing Equipment manufacturers:
      a. Agilent Technologies
      b. Fluke
      c. Microtest
      d. Noyes
      e. Ideal
   4. Multimode/Singlemode fiber testing shall be I.A.W. TIA/EIA-526-14 Method “B”. System loss measurements (both calculated and measured) shall be provided at 850 and 1300nm in both directions for multimode cables (1310 and 1550nm for singlemode) for each strand. Per IEEE 802.3z, maximum fiber strand attenuation shall not exceed 2.38dB @ 850nm with a modal bandwidth of 160Mhz-km and 2.35dB @ 1310nm with a modal bandwidth of 500Mhz-km. Test as follows:
      a. Measure and record normalized fiber loss at operating wavelength in dB/kn.
      b. Detect and record point faults or discontinuities.
      c. Measure and record overall length of cable.
   5. Certification report shall be provided listing both the calculated and measure loss for each fiber optic circuit and submitted with the test results as called for above. Documentation of testing shall include:
      a. Wavelength, fiber type, fiber manufacturer and cable model number, cable manufacturers' attenuation specifications, cable manufacturers' bandwidth specifications, measurement direction, test equipment and serial numbers (with date of last calibration), date of each test, reference setup, name of technician(s) performing testing.
      b. OTDR trace(s) shall be submitted with require for substantial completion.
   6. Each test result shall indicate the cable number, test date and tester name. All test results are to be submitted to the project engineer in a neat, clean and orderly nature. The test sheets are to be submitted electronically and divided by panel in numeric order.
   7. No handwritten test results will be accepted by the project engineer.

3.14 EXTRA MATERIALS AND LABOR

A. This contractor shall include in their bid an allowance to install five (5) additional data outlets with an average length of 200 feet as directed by the project engineer at any time during the

construction process. Any materials that are not used during construction shall be turned over to the owner at the final acceptance of the building.

END OF SECTION

SECTION 27 11 16
COMMUNICATIONS RACKS, FRAMES AND ENCLOSURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Free standing communication racks

B. Cable management

1.02 SUMMARY

A. Provide all labor, materials, and equipment for the complete installation of each rack.

1.03 GENERAL REQUIREMENTS

A. The drawings and specifications indicate the intent and direction of the installation. Items and their location are shown diagrammatic and are to be field verified by the contractor prior to completing work associated with the item.

B. All work shall be performed in strict accordance with all applicable laws, ordinances, codes of local, state and federal government, or other authorities having lawful jurisdiction. The contractor is required to verify all requirements.

C. The contractor shall furnish all required labor, material, and associated tools to facilitate the installation of all the equipment racks, cabinets, frames and associated items specified herein and with respect to the infrastructure design drawings without damage to the cables, associated items, and/or facilities.

D. Qualified personnel, utilizing state-of-the-art equipment and techniques shall complete all installation work.

E. All materials shall be installed in accordance with the manufacturer's specified recommendations and practices.

1.04 QUALITY ASSURANCE

A. Standards: All equipment, devices, and other associated items and work shall conform to the most recent requirements of the following codes, standards, and organizations where applicable:
   1. TIA - 569-B Commercial Building Standard for Telecommunications Pathways and Spaces
   2. ANSI/TIA - 568-C Commercial Building Telecommunications Cabling Standard
   3. ANSI/NECA/BICSI 568-2006 - Standard for Installing Commercial Building Telecommunications Cabling
   4. TIA - 606-A Administration Standard for Commercial Telecommunications Infrastructure
   5. ANSI-J-STD - 607-A Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
   6. ANSI/TIA-942 Telecommunications Infrastructure Standard for Data Centers
   7. NFPA 70 - National Electric Code

B. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner or Owner’s Representative. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where “approved equal” is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

1.05 SUBMITTALS

A. The contractor is to provide material cut-sheet for all products listed in this specification, and any other material not listed but required for proper installation.

B. Provide both the manufacturer's certification for all installers and technicians that will have a role in this project

1.06 DELIVERY, STORAGE, AND HANDLING

A. The contractor shall coordinate all delivery, storage and handling concerns with the general contractor.

B. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for equipment placed in storage.

1.07 APPROVED EQUIPMENT VENDORS

A. All cabling and conductivity products provided by the structured cabling contractor shall be part of the following complete end-to-end systems:
   1. Chatsworth Products, Inc.
   2. Middle Atlantic Products
   3. Legrand
   4. Hoffman
   5. Great Lakes
   6. Panduit
   7. Engineer approved equal.

PART 2 PRODUCTS

2.01 FREE STANDING COMMUNICATION RACKS

A. 4-Post Open Rack Description:
   1. The rack shall be manufactured from steel.
   2. Each rack shall have two rectangular mounting frames and four (4) L-shaped horizontal braces. The mounting frames will be a welded sub-assembly made from an L-shaped base angle, an L-shaped top angle and two (2) C-shaped equipment mounting channels.
   3. The rack will assemble with nut and bolt hardware. When assembled, the L-shaped horizontal braces will connect the corners of the welded mounting frames to form an open, four-post rack. The base angles will be pre-punched for attachment to the floor. The top angles and the top horizontal braces will be pre-punched for attaching ladder rack with J-bolts.
   4. The open, four post rack will provide front and rear support for equipment. The vertical equipment mounting channels will be spaced to allow attachment of 19” EIA rack-mount equipment and will be punched on the front and rear facing flanges with the EIA-310-E Universal hole pattern. Each rack-mount space (U) will be marked and numbered bottom-to-top on the mounting channels.
   5. The equipment mounting holes will be square-punched. Each rack shall include fifty (50) square-punched hardware insert kits to accept 12-24 screws.
   6. The rack shall be adjustable in depth during assembly. Rack depth will adjust in fixed .98” increments. Each rack will provide seven depth settings and 5.91” of front-to-rear depth adjustment.
   7. The rack components will be bonded during assembly through the assembly hardware. The rack will have at least one (1) masked ground connection point with attachment points for a two mounting-hole ground terminal block (two-hole lug). Each rack shall include a two mounting-hole ground terminal block and antioxidant joint compound.
   8. The sides of the equipment-mounting channels shall be punched to allow attachment of equipment support rails and vertical cable managers along the sides of the rack or for rack-to-rack baying (four post racks must be able to bay with a two-post relay rack).
   9. The rack shall be rated for 2,000 lb. of equipment.
   10. Refer to the drawings for quantities.

B. 4-Post Open Rack Approved Manufacturers:
   1. Chatsworth Products, Inc.
   2. Engineer Approved Equal

2.02 CABLE MANAGEMENT

A. Vertical Cable Management for Racks/Frames

1. Every rack/frame shall have a minimum of one vertical cable manager. The vertical cable manager shall create a space for storing and organizing cables along the side of the rack/frame. The cable manager shall maintain separation between patch/equipment/jumper cords and premise cables.
2. The vertical cable manager shall match the height of the rack(s)/frame(s).
3. The vertical cable manager shall bolt to the side of rack(s)/frame(s) with included hardware.
4. The cable manager shall be sized to match cabling requirements. Maximum cable fill shall be calculated by dividing 50% of the usable area within the cable manager by the area of a single cable.
5. A single vertical cable manager may be used in between bayed racks/frames if it is sized to match cable requirements for both racks/frames.
6. The single-sided cable manager shall be a C-shaped trough with a front door. The single-sided trough shall provide a single cable pathway. The front sides of the cable manager shall have T-shaped cable guides separated by openings that align with each U space on the rack. The back of the manager shall be mostly open to allow easy cable pass-through. Three fixed management position accessory mounting panels shall allow attachment of cable management accessories at the back of the manager.
7. The double-sided vertical cable manager shall be a double-sided H-shaped trough with a front door and a rear door. The double-sided trough shall provide independent front and rear cable pathways. The front and rear sides of the cable manager shall have T-shaped cable guides separated by openings that align with each U space on the rack. The middle of the managers shall be mostly open to allow easy cable pass-through. Three movable mid-sections shall allow attachment of cable management accessories inside the cable manager. The movable mid-sections shall adjust front-to-rear to allow a 40/60, 50/50 or 60/40 front/rear split of the interior cable management space.
8. The door shall be removable, hinged to open from right or left side, with a two-point latch and a single knob on the right and left side to secure the door in the closed position. The front door shall have a two-tone finish: black with a vertical aluminum panel at the center. The rear door on double-sided cable managers shall be flat with a black finish.
9. The T-shaped cable guides shall be made from a composite plastic material (not metal) and shall have rounded edges to protect cables. Openings between the T-shaped guides will be evenly spaced.
10. The cable manager shall be delivered individually boxed, and available in several widths as specified in the contract documents.
11. The vertical cable manager shall be a matched solution from the rack/frame manufacturer and be manufactured from steel, aluminum and plastic.
12. Refer to drawings for quantities and exact part numbers.

B. Horizontal Cable Management for Racks/Frames
1. Place horizontal cable managers above and below each patch panel on/in each rack/frame/cabinet. The horizontal cable manager will guide patch/equipment cords between the vertical cable manager and individual network port connections.
2. The cable manager will be sized to match cabling requirements. Provide 1U of horizontal cable management for every 2U of connectivity. Cables must be able to access the cable manager so that no ports are blocked by the cables.
3. The manufacturer will state estimated cable fills for the cable manager in the product data sheet.
4. The horizontal cable manager will match the rack-mount width of the rack(s)/frame(s)/cabinet(s).
5. The horizontal manager will attach to the front or rear of the rack/frame/cabinet with screws and will be sized to fit within standard EIA-310-D rack mount spacing. The manufacturer of the horizontal cable manager will sell compatible racks/frames/cabinets.
6. The horizontal cable manager will be a single-sided C-shaped trough with a cover. The single-sided trough will have a slot or holes at the rear to facilitate front-to-rear cabling

through the horizontal manager. The front of the cable manager will have T-shaped cable guides along the top and bottom surfaces of the cable manager. Evenly spaced cable openings in between the T-shaped cable guides allow cables to enter/exit the cable manager into the rack-mount space. The openings will have rounded edges to protect the cables. The cover will be removable, hinged to open up or down and will snap on to secure the cover in the closed position.

7. The horizontal cable manager shall be a matched solution from the rack/frame manufacturer and be manufactured from sheet aluminum and composite material.
8. Refer to drawings for quantities.

PART 3 EXECUTION

3.01 GENERAL

A. Free Standing Communication Racks

1. Assemble frames according to manufacturer's instructions. Verify that equipment mounting rails are sized properly for rack-mount equipment before attaching the frame to the floor.
2. All frames must be attached to the floor in four places using appropriate floor mounting anchors. When placed over a raised floor, threaded rods should pass through the raised floor tile and be secured in the structural floor below.
3. Frames shall be individually grounded to the TGB using appropriate hardware provided by the contractor. “Daisy Chaining” multiple racks/frames together for grounding purposes shall be unacceptable. The ground will meet local code requirements and will be approved by the Authority Having Jurisdiction (AHJ).
4. Ladder rack may be attached to the top of the frame to deliver cables to the frame. The frame should not be drilled to attach a ladder rack. Use appropriate hardware from the ladder rack manufacturer.
5. The equipment load should be evenly distributed and uniform on the frame. Place large and heavy equipment towards the bottom of the frame. Secure all equipment to the frame with equipment mounting screws.
6. Cabinets shall be securely bonded to the Telecommunications Grounding Busbar (TGB). Attach a bonding conductor sized as defined in J-STD-607-A and as defined by local code or the authority having jurisdiction (AHJ) between the Telecommunications Grounding Busbar and the cabinet. Attach the bonding conductor to the cabinet using a ground terminal block according to the manufacturer’s installation instructions. The installer shall provide the bonding conductor and other necessary hardware required to make the connections between the cabinet and the Telecommunications Grounding Busbar.

B. Cable Management

1. Attach vertical cable managers to the side of the rack/frame using the manufacturer's installation instructions and included hardware.
2. When a single vertical cable manager is used in between two racks/frames, attach the vertical cable manager to both racks/frames.
3. When more than one cable manager is used on a rack/frame or group of racks/frames, use the same make, style and size of vertical cable manager on the rack/frame or in between racks/frames.
4. The color of the rack(s)/frame(s) and cable manager(s) must match.
5. Door shall be attached to the cable manager and in the closed position after cabling is complete.

END OF SECTION

SECTION 27 32 00
AREA OF REFUGE TWO-WAY COMMUNICATIONS SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Communications Requirements specifically applicable to Electrical Division Specification Sections.

B. Division 27 Specification requirements also include, by reference, all "common" specification sections; Notices, Advertisements, Instructions to Bidders, Proposals and General Conditions. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

C. Division 27 Specification requirements also include, by reference, all Division 1 - General Requirements specification requirements. Requirements of these specification sections are included as a part of this contract.

1.02 SYSTEM DESCRIPTION

A. Two-Way Emergency Communication
   1. Provide a new Two-Way Emergency Communication system for all designated area of refuge/rescue assistance, Stairway Communications, Elevator Landing Communications, Occupant Evacuation Elevator Lobby Communications consisting of all required equipment, conduit, boxes, wiring, connectors, hardware, accessories, system programming, etc. as necessary, for a complete operating system that provides the functional intent indicated.

B. System Description:
   1. When a call for assistance is initiated at call station:
      a. Remote Call Stations: Located at elevator lobbies or designated area of refuge/rescue assistance as indicated on drawings, unless otherwise directed by building and fire code officials.
      b. Master Control Station: Located as indicated on drawings, unless otherwise directed by building and fire code officials.
      c. System battery backup is required, 24 hours standby followed by 240 minutes of use.
      d. Timed, automatic phone connection to designated constantly attended monitoring location is required.
      e. Fully addressable digital system expandable up to 30 remote call stations.
      f. Fully supervised system including remotes and communication circuit.
      g. System shall be capable of T-Tapping communication and power circuits while maintaining full supervision of each T-Tapped branch circuit.
   2. System Operation:
      a. When a call for assistance is initiated at call station:
         1) Provide audible and visual notification at call station to confirm that call has been placed.
         2) Provide audible and visual notification at command panel(s) that call has been placed.
         3) Maintain visual notification of each call location at control station(s) until manually reset by control station operator.
         4) Maintain audible notification at command panel (s) that call(s) have been placed until call is acknowledged by operator.
         5) Maintain visual notification at call station until reset by operator.
      b. When a call for assistance is acknowledged at command panel:
         1) Provide visual notification at call station that call has been picked up and is active.
         2) Establish two-way voice communication between call station and command panel.

3) When a call has not been acknowledged, during a programmed time delay, to allow for local response, automatically initiate the call to listed remote monitoring station, identifying specific building with a message and establish two-way voice communication with the remote call station.

C. The command center is to be located at a central control point on the first floor or as determined by local Authority Having Jurisdiction (AHJ). Call stations that communicate with the command center are to be located on all floors above and below the level of exit discharge.

D. The emergency communication hardware shall comply with the Americans with Disabilities Act (ADA). The call boxes shall have the ability to be programmed with up to 2 emergency phone numbers (either both Off-Site or Base Station and Off-Site). Upon activation of the emergency push button, a call will be automatically placed to the centralized location. If there is no answer at the centralized location the call boxes must dial a secondary location outside the building to activate **two way off-site person to person voice communications.**

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. ICC (IBC) - International Building Code; Most Recent Edition Adopted by the local building official and fire code official, Including All Applicable Amendments and Supplements through the 2024 Code cycle.

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by local building and fire code officials, Including All Applicable Amendments and Supplements.

F. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.

G. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by local building and fire code officials, Including All Applicable Amendments and Supplements.

H. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

I. UL2525 Two-Way Emergency Communication System for Rescue Assistance.

J. NEC Article 700.8 – Emergency Systems Surge Protection Devices

1.04 SUBMITTALS

A. Shop Drawings: provide a building layout showing each device and wiring connection required.

B. Product Data: Provide electrical characteristics and connection requirements.

C. Test Reports: indicate satisfactory completion of required tests and inspections.

D. Manufacturer’s Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation and starting of products.

1.05 PROJECT RECORD DOCUMENTS

A. Record actual location of devices, and signage.

B. Deliver to owner as both hard copy and electronic file.

1.06 OPERATION AND MAINTENANCE DATA

A. Operation Data: Operating Instructions.

B. Maintenance Data: Maintenance and repair procedures.

1.07 WARRANTY

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished, and labor installed under this contract for a period of three years after date of final acceptance.

1.08 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with a minimum ten years of experience.

B. Installer: Company specializing in installing the products specified in this section with three years (min.) experience.

C. Installer shall be capable of answering trouble calls from a permanently maintained location less than 100 miles from project site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Space Age Electronics - Basis of Design: LifeGuard Networks – Shield30

B. Jeron Electronic Systems

C. Emcom

D. Engineer approved equal.

2.02 RESCUE ASSISTANCE SYSTEM CONTROL PANEL

A. Control Panel Description:
   1. Panel shall have battery backup to comply with all local codes and standards.
   2. This system shall consist of multiple remote call stations, which will communicate with one to five control panels and have access to a public telephone system for external alarm notification and two-way voice communication.
   3. The control panel must have a powder coated steel housing (surface or flush mount), include a handset, and be powered from power supply with battery backup. Power supply must be listed for use with system.

B. Quantity:
   1. Refer to the drawings for each required device location.

2.03 REMOTE CALL STATIONS

A. Remote Call Station Description:
   1. The remote call station shall have a momentary switch, microphone, and loudspeaker.
      a. Vandal resistant speaker.
      b. Suitable for indoor environment, unless specified by the manufacture for outdoor use in conjunction with an approved manufactures enclosure.
      c. Finish: Silver powder coated steel.
      d. Mounting: Surface or flush-mounted.
      e. Provides distinct means to initiate call for assistance.
      f. Provides for distinct audible and visual notification to confirm that call has been placed and for distinct visual notification that call has been acknowledged.
      g. Provide distinct visual notification to confirm the station is connected and communicating.
      h. Following initial call for assistance, provides for hands-free two-way communication with command panel.
      i. Addressable micro-controller operation providing supervision and full digital communications.
      j. Product(s):
         1) Provide Shield30 (SR01V, SR02V) Remote Call Station.
         2) Remote Back Box (SRBV, SRLBV).
   2. The station shall have hands free voice communication with the control panel(s).
   3. The station shall have silk-screened operating instructions.
   4. The station shall be vandal resistant. The standard two gang mounting plate shall be flush and incorporates heavy-duty switches and speakers along with stainless steel plates.

B. Quantity:

1. Refer to the drawings for each required device location.

2.04 SIGNAGE

A. System shall consist of a minimum of one “location” and “instruction” sign to clearly indicate location of designated area.

B. A tactile sign with raised lettering and braille shall be located at the entrance to area.

2.05 AREA OF REFUGE DIALER (CELLULAR)

A. Furnish and install a dedicated cellular dialer for the area of refuge system. Dialer shall meet IBC requirements, shall utilize the latest radio technology available at the site, shall not interfere with other cellular dialers within the facility, and shall operate without interruption from inside the facility.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer’s instructions.

B. Install all required cabling from the control panel to each individual remote call station.

C. Insulated bushing on conduit ends and wiremold ends.

D. Conduit is required for pathway survivability requirements. Minimum conduit size shall be 3/4 inch.

3.02 FIELD QUALITY CONTROL

A. Upon completion of the rescue assistance system installation, the contractor shall provide a written statement advising the architect of completion and to being compliance with fire and electrical codes and in accordance with wiring diagrams, instructions and direction provided by the manufacturer.

B. A Representative of the manufacturer shall certify the system complete and that the owner has received adequate instructions in system operation.

3.03 MANUFACTUERER’S FIELD SERVICES

A. Prepare and start systems.

B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.

3.04 DEMONSTRATION

A. Demonstrate normal and abnormal modes of operation and required responses to each.

3.05 ADA HEIGHT

A. The new rescue assistance system devices will require new back boxes for the remote call stations. Install at ADA height of 48 inches to the operating mechanism of any remote call station, which is newly installed in order to comply with a wheel chair bound person’s forward reaching.

B. The newly mounted devices shall not protrude from the wall over four inches (4”) to comply with ADA.

3.06 CABLE

A. The rescue assistance system manufacturer shall approve the low voltage cable. All low voltage electrical cable that is installed as per of the new rescue assistance system shall be plenum rated cable where required.

B. The cable, which is installed without using raceway, shall be neatly routed and supported every four feet (4’) by no less than a nylon wire tie or supported in bridle rings. All wiring in mechanical rooms shall be in conduit. All exposed wiring shall be in raceway. No cable shall be allowed to lay on the accessible ceiling tile.

END OF SECTION

SECTION 27 41 00
AUDIO VIDEO SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. WPD - Training A 2101
B. WPD - Training B 2102
C. WPD - Police Conference 2113
D. Briefing Room 1313
E. Conference 2215
F. Conference 3208
G. Meeting Room 3307
H. Large Conference Room 3600
I. Council Chambers 3601
J. Mollenhoff Conference 3602

1.02 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 RELATED SECTIONS

A. Specification Section 27 0050 - Basic Communications Requirements
B. Specification Section 27 0090 - Minor Communication Demolition for Remodeling
C. Specification Section 27 1005 - Telecommunications Cabling Infrastructure

1.04 REFERENCES

A. NFPA 70 - National Electrical Code
B. ADA - Accessibility Guidelines for Buildings and Facilities
C. INFOCOMM F501.01:2015 - Cable Labeling for Audiovisual Systems
D. AVIXA A102.01:2017 - Audio Coverage Uniformity in Listener Area

1.05 SYSTEM DESCRIPTION

A. Training 2102 (Base Bid)
   1. he room will have one 85" display with an HDMI input underneath. Program audio will come from ceiling speakers. Control will be from a 7" touchscreen.
   2. Head end will be located in Electrical/IT Storage 2008.

B. Training A 2101 / Training B 2102 (Alternate Bid)
   1. Training Room B 2102 will have one 85" display with an HDMI input underneath. Training Room A 2101 will have one 75" display with HDMI input underneath. Program audio in each room will come from ceiling speakers. Control will be from a 7" touchscreen in each room.
   2. Rooms will operate independently when airwall is closed, and together when airwall is open. A partition sensor will be installed to automate combining/dividing the rooms.
   3. Shared head end will be located in Electrical/IT Storage 2009.

C. Briefing / Conference Rooms
   1. Each room shall have an HDMI extender transmitter under the table, connecting to a shielded Cat6 jack in the floorbox. The HDMI receiver will be located behind the display. Displays and mounts shall be owner-furnished, contractor installed. Control of the display shall be from the factory remote.

D. Council Chambers / Mollenhoff Conference
   1. Existing equipment from the current council chambers shall be transferred to these rooms by owner's contractor. 274100 contractor will have no scope in these rooms.

1.06 GENERAL REQUIREMENTS

A. The drawings and specifications indicate the intent and direction of the installation. Items and their location are shown diagrammatic and are to be field verified by the contractor prior to completing work associated with the item.

B. All work shall be performed in strict accordance with all applicable laws, ordinances, codes of local, state and federal government, or other authorities having lawful jurisdiction. The contractor is required to verify all requirements.

C. The contractor shall furnish all required labor, material, and associated tools to facilitate the installation of all the audio and video equipment associated items specified herein and with respect to the design drawings without damage to the cables, associated items, and/or facilities.

D. Qualified personnel, utilizing state-of-the-art equipment and techniques shall complete all installation work.

E. All materials shall be installed in accordance with the manufacturer's specified recommendations and practices.

1.07 SUBMITTALS

A. The contractor is to provide material cut-sheet for all products listed in this specification, and any other material not listed but required for proper installation.

B. Provide both the manufacturer's certification for all installers and technicians that will have a role in this project.

C. Shop drawings: Submit plans, elevations, sections, details, and attachments to other work.
   1. Indicate all system device locations on architectural floor plans. No other system(s) shall be included on these plans.
   2. Include full schematic wiring information on these drawings for all devices. Wiring information shall include cable type, conductor routings, quantities, and connection details at device.
   3. Include a touch panel layout and statement of the system sequence of operation for owner to review and approve.

D. Operation and Maintenance Data:
   1. Provide one (1) set electronic format manuals including operating instructions, maintenance recommendations and parts list including wiring and connection diagrams modified to reflect as-built conditions.
   2. Manuals: Deliver final copies of the manuals within thirty (30) days after completing the installation test.
   3. The basics of the manuals shall include the following:
      a. The contents of the manual identified on the cover.
      b. Include names, addresses, and telephone numbers of the Contractor responsible for the installation and maintenance of the system and the factory representatives for each item of equipment for the system.
      c. The manuals shall have a table of contents and labeled sections. The final copies delivered after completion of the installation test shall include all modifications made during installation, checkout, and acceptance testing.
      d. There shall be a set of Functional, Hardware, and Software manuals.
      e. The functional manual shall identify the operational requirements for the system and explain the theory of operations, design philosophy, and specific functions. Include a description of hardware and software functions, interfaces, and requirements.
      f. The hardware manual shall describe the equipment furnished including:
         1) General description and specifications

2) Equipment layout and electrical schematics to the component level
3) Alignment and calibration procedures
4) Manufacturer's repair parts list indicating sources of supply.

g. The software manual shall describe the functions of software and include all other information necessary to enable proper loading, testing, and operation. This manual shall include:
1) Definition of terms and functions.
2) System use and application software.
3) Initialization, startup, and exit.
4) Reports generation.
5) Details on forms customization and field parameters.

h. As-Built Drawings: During system installation, the Contractor shall maintain a separate hard copy set of drawings, elementary diagrams, and wiring diagrams of the systems to be used for record drawings. This set shall be accurately kept up to date by the Contractor with all changes and additions to the systems. Copies of the final as-built drawings shall be provided to the end user in an acceptable AutoCAD (DWG/DXF) format.

i. System Programming: A copy of the final as-built programming and configuration shall be provided to the end user on a USB drive.

j. Provide a yearly cost, if any, associated with the licensing of the software.

1.08 QUALITY ASSURANCE

A. Equipment Qualifications:
1. Equipment manufacturers shall be an established organization with referenced and documented experience delivering and maintaining components of equal or higher sophistication and complexity as compared to the system detailed in this specification.
2. Equipment installers shall employ at a minimum the following methods for quality assurance of component and assembly devices.
a. Perform visual inspection of devices to verify assembly according to defined procedures. Perform end of line operational tests to ensure product functionality has been correctly configured.
3. Perform individual functionality and system level testing to ensure compliance with product specifications. Perform single and multiple unit system tests to mimic end-user installation configurations. Utilize automated hardware and software testing to evaluate system performance under published operational loads and compare to published system capabilities.

B. Bidder Qualifications:
1. At the time of the bid, the bidder shall have satisfactorily completed projects of a similar size, scope, and complexity as the system detailed in this specification. The bidder shall furnish written proof of experience from three (3) references and proof of current accreditation or certification by the manufacturer for required training for sales or installation or service of the associated devices.
2. The bidder shall also be a factory authorized local service organization under this contract. Local shall be defined as an area in a 125 mile radius of the installed location.

1.09 DELIVERY, STORAGE, AND HANDLING

A. The contractor shall coordinate all delivery, storage and handling concerns with the general contractor.

B. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for equipment placed in storage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Refer to AV Equipment Schedules located in drawings for a full list of manufacturers and part numbers for basis of design.

B. All cable utilized shall meet manufacturer's recommendations for devices provided.

C. Refer to 27 1005 for additional approved manufacturers for category cable.

D. All cable used for HDBaseT devices shall be on the HDBaseT Alliance recommended list.

PART 3 EXECUTION

3.01 INSTALLATION

A. The drawings and specifications are considered to reflect the intent and direction for a complete and operational system (s). Install in accordance with manufacturer's instructions.

B. Mounting Heights: Coordinate locations of outlet boxes specified to obtain mounting heights indicated in Architectural elevations and other drawings.

C. Material description and manufacturer's part numbers are shown. The contractor is expected and has the responsibility to verify that the part number matches the description. Any discrepancy is to be noted to the engineer prior to response submittal. The cabling contractor is responsible for the correct materials being furnished and installed.

D. Install input circuits in separate cables and raceways from output circuits.

E. Leave 18 inch excess cable at each termination at volume pad, speaker, and other system outlet.

F. Leave six feet (6') service loop of cable at each termination at system cabinet.

G. Provide protection for exposed cables where subject to damage.

H. Support cables above accessible ceilings to keep them from resting on ceiling tiles. Use spring metal clips or plastic cable ties to support cables from structure or ceiling suspension system. Include bridle rings or drive rings.

I. Use suitable cable fittings and connectors.

J. Install equipment racks in location shown; arrange to provide adequate ventilation and access.

K. Ground and bond the equipment and circuits in accordance with Specification Section 26 0526 Grounding and Bonding for Electrical Systems.

L. Use plenum rated cable in concealed accessible locations. In accessible visible locations run cable in conduit.

M. Coordinate all IP addresses required for equipment with the owner.

N. All programming needs shall be coordinated directly through the owner with regard to touch screen layout and room function.

O. Refer to 27 1005 for category cable installation procedures.

3.02 FIELD QUALITY CONTROL

A. All equipment, parts and materials supplied shall be new and free from manufacturing defects.

B. Audio levels shall be uniform within 6db throughout room.

C. Audio levels shall be adjusted to achieve 10db above ambient room noise levels. Measure and record sound levels at consultant coordinated locations.

D. Refer to 27 1005 for category cable testing procedures.

3.03 MANUFACTURER'S FIELD SERVICES

A. Include making final wiring connections, inspection and adjusting of completed installation and systems demonstration.

B. Certify that installation is complete and performs according to specified requirements.

3.04 ADJUSTING

A. Adjust transformer taps for appropriate sound level.

B. Adjust devices and wall plates to be flush and level.

3.05 OWNER PERSONNEL TRAINING

A. Provide detailed operation and maintenance instruction and training. This training is to be performed on site after substantial completion of project. Training session are to be captured on video and provided to the client with close out documentation.

B. Use submitted operation and maintenance manual as reference during training. Supplement with additional training materials as required.

C. Contractor shall submit training materials to the consultant prior to training.

D. Provide two 1-hour training sessions for the training rooms and one half-hour training session for the conference rooms.

3.06 WALL PLATES

A. As a minimum, each outlet shall be labeled as to its function and a unique number to identify cable link in accordance with the section titled LABELING.

3.07 PULL CORDS

A. Pull cords shall be installed in conduit serving audio video outlets that do not have cable installed. Provide pull cords for any conduit longer than 10'.

3.08 EQUIPMENT RACKS, BRACKETS AND CABINETS

A. All equipment racks, brackets and cabinets hosting telecommunications equipment shall all be installed in accordance with the manufacturer's recommendations. Permanently anchor all racks to the floor.

3.09 GROUNDING AND BONDING

A. Provide in accordance with TIA J-STD-607, NFPA 70 and as specified in Specification Section 26 0526 Grounding and Bonding for Electrical Systems.

3.10 LABELING

A. Provide labeling in accordance with AVIXA standards. Handwritten labeling is unacceptable. Stenciled lettering for voice and data circuits shall be provided using either thermal ink transfer or laser printing.

B. Cables shall be labeled using color labels on both ends with identifiers in accordance with TIA/EIA-606.

C. Workstation outlets and patch panel connections shall be labeled using color coded labels with identifiers in accordance with TIA/EIA-606.

END OF SECTION

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SECTION 28 00 50
BASIC ELECTRONIC SAFETY AND SECURITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Electronic Safety and Security Requirements specifically applicable to Electrical Division Specification Sections.

B. Division 28 Specification requirements also include, by reference, all Division 00 and 01 specification sections. This contractor is responsible to review these specification sections. Requirements of these specification sections are included as a part of this contract.

C. Division 28 Specification requirements also include, by reference, Specification Section 08 7100 - Door Hardware. Review and inclusion of the electrical requirements of this specification section are included as a part of this contract.

1.02 WORK BY OWNER

A. The Following Work or Sub Contracts Will Be Furnished and Installed By The Owner:
   1. Security cameras devices shall be installed by owner. All rough-ins, shall be by electrical contractor as shown on plans. Structured cable contractor shall provide network connectivity at locations indicated on plans.
   2. Access Control head end shall be installed by owner. All rough ins, shall be by electrical contractor as shown on plans. Structured cable contractor shall be provide network connectivity at all locations indicated on plans. Existing server shall be relocated to new building. Coordinate network settings to maintain operation at both buildings until move is complete.

B. Owner's Responsibility:
   1. Arrange for and deliver owner reviewed shop drawings, product data and samples to contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with contractor.
   4. Submit claims for transportation damage and replace damaged, defective or deficient items.

C. Contractor's Responsibility:
   1. Review owner reviewed shop drawings, product data and samples.
   2. Review and unload owner purchased materials at site, inspect for completeness and/or damage jointly with the owner.
   3. Handle, store, install and finish products. Install electrical wiring and devices.
   4. Repair and/or replace items damaged after receipt.

1.03 OWNER OCCUPANCY

A. The owner will not occupy the premises during the construction period.

B. Limit use of site and premises to allow owner occupancy.

C. Cooperate with the owner to minimize conflict and to facilitate owner's operations.

D. Schedule the work to accommodate this requirement.

1.04 REGULATORY REQUIREMENTS

A. This contractor shall give proper authorities all requisite notices relating to work in their charge, obtain official permits, licenses for temporary construction and pay proper fees for it.

B. This contractor is to be solely answerable for and shall promptly make good all damage, injury or delay to other contractors, to neighboring premises or to persons or property of the public by themselves, by their employees or through any operation under their charge, whether in the contract or extra work.

C. No attempt has been made to reproduce in these specifications any of the rules or regulations contained in city, state or federal ordinances and codes pertaining to the work covered by these specifications that the contractor be thoroughly familiar with all such ordinances and codes.

D. The fact that said various rules, regulations and ordinances are not repeated in this specification does not relieve the contractor of the responsibility of making the entire installation in accordance with the requirement of those authorities having jurisdiction.

E. All work shall comply with the applicable recommendations of:
   1. National Board of Fire Underwriters
   2. ANSI-NFPA 70 National Electrical Code
   3. National Fire Protection Association (NFPA)
   4. Occupations Safety and Health Act (OSHA)
   5. IBC Building Code (current) and any current applicable city building and or electrical codes.
   6. Fire Protection: Conform to UFC and NFPA

F. Obtain permits and request inspections from authority having jurisdiction.

G. Conform to latest approved versions of codes.

H. ICC 500 Rated Storm Shelter
   1. The contractor shall comply with all installation requirements as dictated in applicable in the current ICC 500 ICC/NSSA Standard for the Design and Construction of Storm Shelters.
   2. Refer to drawings for ICC 500 footprint extents and additional requirements.
   3. ALL CONDUIT GREATER THAN 2" IN DIAMETER PENETRATING THE STORM SHELTER STRUCTURE SHALL USE STEEL ELBOWS. COORDINATE ALL PENETRATIONS WITH DESIGN TEAM DURING SHOP DRAWING PHASE.
   4. Numerous penetrations may occur within a single shroud. Coordinate with other trades for bunched penetrations.

1.05 PROJECT/SITE CONDITIONS

A. Install work in locations shown on drawings unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of owner and architect/engineer before proceeding.

C. This contractor shall, before submitting their bid, visit the site of the project to familiarize themselves with locations and conditions affecting their work.

D. It is the intent of this specification that the contractor furnishes all labor and material required to complete the installation as outlined in the drawings and specifications. No additions to the contract price shall be allowed due to the failure of this contractor to properly evaluate the effect of existing conditions on the work to be done under this contract.

E. Whenever renovation or remodeling or relocation of existing equipment is included in the contract, it is imperative that all locations of existing wiring conduits, electrical panels, equipment, services and grades be noted on the job site before bid is submitted and that all elevations and grades be verified before roughing in new work.

F. This contractor shall provide holes as necessary for the installation of their work and in accordance with materials other than the structure.

1.06 SEQUENCING AND SCHEDULING

A. This contractor shall arrange their work in order that it progresses along with the general construction of the building.

B. This contractor shall be kept informed as to the work of other trades engaged in this project and shall execute their work in such a manner so as not to delay or interfere with progress of other contractors.

C. Where space for electrical lines and conduit is limited, it is imperative that all such trades coordinate their work so as to Ensure concealment in space provided. Where conflict exists, the design team shall decide priority of space. If work is not properly coordinated, the design team may require removal and relocation of work without additional compensation.

1.07 GUARANTEE

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished and labor installed under this contract for a period of one year after date of final acceptance, unless a longer period is specified.

B. Neither final certificate of payment nor any provisions in the contract documents nor partial or complete occupancy of premises by owner shall constitute an acceptance for work not done in accordance with contract documents or relieve the contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

C. Should any defects arise as the result of defective workmanship or material within the guarantee period set forth, this contractor shall make the necessary correction at their own expense.

1.08 ENGINEER APPROVED EQUAL PRODUCTS

A. When the engineer, at the request of the interested parties, including the contractor, supplier and manufacturer approved "engineer approved equal" products for this project, such products are approved on the assumption that they will equal or exceed the performance of the products specified.

B. If such products do not do so after being installed on this project, this contractor shall replace or modify the particular product as necessary to equal the performance of the products specified at no expense to the owner, architect or engineer.

C. Request for "engineer approved equal" products shall be received by the architect/engineer prior to the last addendum being issued. Requests for substitutions received after this date will not be considered. Substitution requests shall clearly state which products are being considered for substitution. Substitution requests shall include all pertinent product information needed to evaluate the substitution as an "equal".

D. Similar products shall be all of the same manufacturer and style. There is no exception to this unless prior approval has been granted from engineer.

1.09 OWNER'S RIGHT OF SALVAGE

A. Before beginning construction the contractor shall check and verify with the owner each item of existing equipment that must be removed.

B. The owner will designate which items of material or equipment not reused that they may wish to keep. This contractor shall then remove these items with care and store in a location designated by the owner for the owner's disposal.

C. All other items of equipment to be removed and not specified for reuse in new construction or reserved by the owner for their use shall become the property of the contractor and shall be removed from the site.

1.10 PROTECTION AND MAINTENANCE

A. The work covered by these drawings and specifications involves all work in the new (alternate) and existing building.

B. Where necessary to connect to any existing utility service, this contractor shall contact the owner and shall coordinate any building service connection with the owner so that normal operation to the building is disrupted as little as possible.

C. Any work to be done in existing structures shall be coordinated with the owner and arrangements made so that traffic flow may be maintained and areas finished where possible before other areas are begun.

D. This contractor shall protect existing equipment in finished areas from dirt, dust and damage as a result of their work.

E. Coordinate protection requirements with department heads before beginning construction.

F. Protect any building openings from unauthorized entry. Coordinate with owner where building entry must be controlled.

1.11 DEMOLITION

A. This contractor shall be responsible for the demolition and removal of all existing electrical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be reused".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.
   4. All elements to be removed are subject to the Owner's Right of Salvage.

B. Preserve services to the existing facility. Extend/reroute/reconnect the existing systems as required providing for the continued function of these systems.

1.12 CUTTING AND PATCHING

A. This contractor shall do all cutting and patching necessary for the installation of their work in all existing and new buildings unless otherwise noted.

B. In areas where the integrity of fire separation assembly/wall is compromised by the work, this contractor shall be responsible to patch and/or seal openings as necessary to maintain and/or return fire separation to rating as required by applicable codes.

C. This contractor shall do all cutting and patching required for their work beyond the remodeled areas unless otherwise noted. All finish work shall include patching to match existing adjacent surfaces. Painting shall be by others.

1.13 CLEANING AND RUBBISH

A. This contractor, upon completion of their work, shall remove all rubbish and debris resulting from their operation and shall remove it from site at their own expense.

B. As far as their work is concerned, all equipment shall be cleaned and the premises left in first class condition.

C. This contractor shall maintain the work area each day to prevent hazardous accumulation of debris from their work.

1.14 SEALING AND PENETRATION

A. Clearance around the piping passing through fire or smoke rated construction shall be sealed to maintain the rated integrity of the construction (1 hr. 2 hrs. etc.). One and two-hour rated assemblies are to be patched on both sides of the assembly.

B. This contractor shall verify rating and location of all such construction with the architectural drawings and seal all penetrations.

C. Manufacturer offering products to comply with the requirements include the following:
   1. Dow Corning "Silicone RTV Foam"
   2. 3-M Corporation "Fire Barrier Caulk and Putty"
   3. Thomas & Betts "Flame Safe Fire Stop System"

D. Installation of these products are to be in strict accordance with the manufacturer's recommendations and architectural specifications, details or equivalent fire stopping general specification section.

E. This contractor shall submit shop drawings showing approved sealing assemblies to be utilized on this project.

1.15 HAZARDOUS MATERIALS

A. If this contractor stores any hazardous solvents or other materials on the site, they shall obtain copies of the safety data sheets for the materials and post them at the site. The contractor shall inform the owner and all employed of any potential exposure to this material.

B. At no time shall any product containing asbestos be incorporated into the work.
   1. If asbestos materials are encountered, report to the owner. The owner will be responsible for asbestos removal.

1.16 RECORD DRAWINGS

A. This contractor shall provide (at the conclusion of the project) one clean, non-torn, neat and legible "as-built" set of drawings to the owner. These drawings shall show the routing of conduit, wiring and equipment drawn in at scaled locations. All cabling, devices, and endpoints shall be labeled and conform to head end programming and system drawings. All dimensions indicated shall be referenced to a column line. A set of construction blueprints will be furnished for this work.

B. All electrical panels and electrical installed equipment shall be shown on the "as-built" drawings.

C. Refer to Architectural Specification Sections for additional requirements.

D. This contractor shall update these drawings during the project at least every week.

1.17 ALTERNATES

A. Refer to description of alternate bids under General Specification Sections.

1.18 REVIEW OF MATERIALS

A. This contractor shall submit to the engineer for review one (1) electronic copy giving a complete list of materials, fixtures, devices and panels they propose to furnish. The brochure shall contain complete information as to the model of equipment, type, size, capacities, dimensions, and illustration. An electronic copy shall be kept on the job at all times.

B. Checking of submittal drawings by the engineer does not relieve the contractor of the responsibility for the accuracy of such drawings and for their conformity to drawings and specifications unless the contractor notifies engineer, in writing, of such deviation at time such drawings are furnished.

C. All submittals shall have the date marked on them when the contractor receives them from the supplier. Submittals shall be submitted through the contractor and shall not come direct from the supplier to the architect or engineer.

D. This contractor shall mark the date and sign each set signifying that the contractor has checked that each of them in their entirety before submitting to the engineer. Submittals that are not dated and signed by the contractor will not be accepted, or checked and will be marked "resubmit" and sent back to the contractor.

1.19 TEST OF SYSTEMS

A. This contractor, before concealed, shall test all systems installed under this contract as called for in these specifications and as required by local codes. Tests shall be made in the presence of the engineer, local authorities or their duly authorized representative. Any defects discovered in testing shall be corrected and the tests repeated until all defects are eliminated.

B. This contractor shall be held responsible for all damage resulting from defects in the system.

C. Each individual feeder circuit shall be tested at the panel and in testing for insulation resistance to ground; the power equipment shall be connected for proper operation. In no case shall the

insulation resistance to ground be less than that required by the National Electrical Code (NEC).

1.20 SCOPE OF WORK

A. This contractor shall furnish all the labor and material to install a complete safety and security system in the new building. The system shall include all items of work as outlined in these specifications and on the drawings.

B. All work shall be performed by a well-qualified and licensed technician with a thorough knowledge of the various systems involved in this building. It shall be this contractor's responsibility to see that their electricians are familiar with all the various codes and tests applicable to this work.

C. All equipment shall be new and of the type specified by the engineer unless otherwise noted in these specifications or on the drawings to remain and or be reused.

D. The intent of the specifications and drawings is for complete installation of the systems outlined in the specifications and drawings so that at the conclusion of construction the system will be turned over to the owner complete and ready for safe and efficient operation.

E. This contractor is required to furnish and install all such items normally included on systems of this type, which, while not mentioned directly herein or on the drawings are obviously essential to the installation and operation of the system and which are normally furnished on quality installation of this type. The specifications and drawings cannot deal individually with the many minute items that may be eventually required by the nature of the systems.

F. This contractor, shall before proceeding with any work, review the architectural drawings. Any conflict between the technology and architectural drawings shall be reported to the engineer for clarification.

G. If there is a discrepancy between the drawings and the specifications or within either document, the more stringent requirement shall be estimated unless brought to the engineer’s attention and an addendum is issued for clarification.

H. The Safety and Security Contractor shall establish system elevations prior to fabrication and installation. The Safety and Security Contractor shall coordinate elevations with other trades. All elevations shall be coordinated with all trades in the field prior to installation. When a conflict between trades arises, the design team shall be notified immediately prior to further installation however priority shall be as follows:
   1. Lighting Fixtures
   2. Gravity flow piping, including steam and condensate.
   3. Electrical bus duct.
   4. Sheet metal.
   5. Cable trays, including access space.
   6. Other piping.
   7. Conduits and wireway.

I. Low Voltage Cable Installation
   1. This contractor is to install if they are licensed to, or contract with a licensed electrician to install conduit serving low voltage cables located in all mechanical rooms and non-accessible areas and exposed structural areas. Use cable trays in other areas as indicated on the drawings. Where cable trays are not accessible, use J-hooks equal to Cablofil or Caddy Cable CAT. No cable shall be allowed to lie on accessible ceilings tiles. Provide sleeves between walls and accessible clouds. Provide hooks with closure holes and cable ties. Mount hooks 3 feet on center.

1.21 DAILY HOUSEKEEPING AND CLEANING

A. At the end of each workday, the contractor shall remove all of their debris, rubbish, tools, and surplus materials from the project work area. The work area shall be broom cleaned and left in

a neat and orderly condition. The contractor, for the removal of debris from the project, shall not use the owner's waste disposal facility.

B. At end of construction, all equipment shall be cleaned and the premises left in first class condition as far as this contractor's work is concerned.

1.22 WALL CONTINUITY (1 HR.)

A. All items mounted in 1 hr. rated walls requiring an opening larger than a four inch (4") square (16 sq. inches) require the 1 hr. rating not be degraded.

B. Any branch panel in a 1 hr. wall will require the exterior of the recessed panel be covered with 5/8 inch fire rated gypsum board. This is true for any device requiring more than a 16 sq. inch opening.

1.23 CABLE

A. The fire alarm system manufacturer shall approve low voltage cable. All low voltage electrical cable, installed as part of a new fire alarm system, shall be plenum rated cable.

B. Cable installed without using raceway shall be neatly routed and supported every 3 feet by no less than a nylon wire tie or supported in bridle rings. All wiring in mechanical rooms shall be in conduit. All exposed wiring shall be in raceways. No cable shall be allowed to lie on the accessible ceiling tile.

1.24 DIGITAL MEDIA AGREEMENT

A. When documents are determined to be available, and as requested by the contractor, they will be transmitted upon the completion and execution of the MODUS digital media agreement. A service fee for each document transmitted will be assessed to the contractor. Documents will be transmitted upon payment receipt. Current service fee is $100.00 per CAD sheet.

1.25 SECURE NETWORKABLE DEVICES

A. Update network devices to the most current software/firmware.

B. Change default password of all networkable devices.
   1. Passwords shall have at least eight characters.
   2. Include uppercase and lowercase letters, numerals, and special characters

C. Supply MAC address and serial number of all networkable devices.

D. Work with the Owner's IT department to align to existing IT standards.

E. Provide to the owner a printed and/or electronic spreadsheet log of all network information including, IP addresses, MAC addresses, logins and password information during system training.

1.26 SYSTEM CONFIGURATION AND PROGRAMMING FILES

A. Supply system configuration and programming files where export is available.

B. Supply uncompiled programming for systems applicable.

C. All configuration and programming shall be property of the owner at conclusion of the project.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

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SECTION 28 00 90
MINOR ELECTRONIC SAFETY AND SECURITY DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements of the Contract Forms, the Conditions of the Contract, Division 1 - General Requirements and Specification Section 26 0050 - Basic Electrical Requirements "General Provisions" apply to this section.

1.02 SCOPE

A. This contractor shall be responsible for the demolition and removal of all existing electrical elements within the project area except as follows:
   1. Elements shown on the drawings as "existing to remain and/or to be relocated".
   2. Elements serving adjacent areas.
   3. Elements required for the support of the newly remodeled areas.

B. Preserve services to the existing facility. Extend, reroute, and reconnect existing systems as required providing for the continued function of these systems.

C. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

D. This contractor shall remove all abandoned equipment, conduit, and supports associated with the remodeled area unless noted otherwise.

E. This contractor is responsible to provide temporary electronic safety and security protection during this project.

1.03 MATERIALS

A. All elements to be removed are subject to the Owner's Right of Salvage.

B. All materials removed shall be the property of the removing contractor and shall be removed from the site by them, unless otherwise specified.

C. The owner may designate and have salvage rights to any material herein demolished by this contractor. It will be the owner's responsibility to designate such salvageable items and remove them prior to the contractor working in that area.

1.04 EXISTING CONDITIONS

A. If any existing devices that are to remain are disturbed by operations under this contract, the contractor is required to re-establish continuity of such systems.

B. This contractor shall arrange for the general contractor to repair and patch all construction with material necessary to match surrounding due to removal of equipment and conduit.

C. This contractor shall furnish all required labor and material, where required, to extend new work to connect to similar work for extension of existing systems.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. **Beginning of demolition means installer accepts existing conditions.**

B. Demolition drawings are based on casual field observation and existing record documents. Report discrepancies to the owner before disturbing the existing installation.

C. Verify field-circuiting arrangements and reconnect as necessary.

D. Verify that abandoned wiring and devices serve only abandoned facilities. Reconnect circuits, as required, to prevent de-energizing of remaining receptacles of lights.

3.02 PREPARATION

A. Disconnect safety & security in walls, floors, and ceilings scheduled for removal.

B. Coordinate service outage with local utility company, inspectors, owners, and design team.

C. Provide temporary wiring and connections to maintain existing systems in service during construction.

D. Existing safety and security services: Maintain existing system in service until new systems are complete and ready for deployment. Disable systems only to make switchover connections. Obtain permission from the owner, at least 1 week before partially or completely disabling any system. To minimize outage, duration, make temporary connections as required.

E. Existing Building Security System, Video Surveillance, Door Access, and Fire Alarm Systems:
   1. Maintain existing system in service until new systems are accepted.
   2. Disable system only to make switch over and connections
   3. Obtain permission from the owner at least 1 week before partially or completely disabling system.
   4. Minimize outage duration.
   5. Make temporary connections to maintain service in areas adjacent to work areas.

3.03 DEMOLITION AND EXTENSION OF EXISTING SAFETY AND SECURITY

A. Demolish and extend existing safety and security work under provisions of this section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors and patch surfaces.

E. Disconnect abandoned cable and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide a blank cove for abandoned devices that have not been removed.

F. Disconnect and remove abandoned control panels and head end equipment.

G. Disconnect and remove devices and equipment service abandoned safety and security system.

H. Repair adjacent construction and finishes damaged during demolition and extension work.

I. Maintain access to existing safety and security installations that remain active. Modify installation or provide access panel as appropriate.

J. Extend existing installation using materials and methods compatible with existing electrical installations or as specified.

3.04 CLEANING AND REPAIR

A. Clean and repair existing materials that remain or are to be reused.

B. Control Panels: Clean exposed surfaces and check tightness of all connections. replace damaged items and equipment. Provide typed directory showing revised changes or programming.

3.05 INSTALLATION

A. Install relocated materials and equipment.

END OF SECTION

SECTION 28 13 00
ACCESS CONTROL SYSTEM

PART 1 GENERAL

1.01 SYSTEM VENDOR

A. Procure services of existing Access Control Contractor, Continental, Hawkeye Alarm, Ross Samek, 319-232-0490, ross@hawkeyealarm.com

1.02 SECTION INCLUDES

A. Access control system field hardware

B. Electrical power requirements

1.03 RELATED SECTIONS

A. Specification Section 08 7100 - Door Hardware

B. Specification Section 26 0433 - Raceways and Boxes for Electrical Systems

C. Specification Section 26 0519 - Electrical Power Conductors and Cables for Electrical Systems

D. Specification Section 26 0526 - Grounding and Bonding for Electrical Systems

1.04 REFERENCES

A. ADA - Accessibility Guidelines for Buildings and Facilities

B. NFPA 70 - National Electrical Code

C. NFPA 72 - National Fire Alarm and Signaling Code

D. IBC International Building Code

1.05 SUMMARY

A. Access control system (ACS) shall be an extension of the owner's existing Continental Access Control System.

B. The existing access control system manages the security operations for multiple sites. It shall consist of all the software and hardware necessary to provide access control and alarm monitoring either from a workstation on the local area network or remotely, utilizing the internet.

C. The system shall be designed such that entry/exit points may be added in one, two, four or eight door increments.

D. All software and licensing necessary for full system functionally shall be included as part of this solution.

1.06 GENERAL REQUIREMENTS

A. The drawings and specifications indicate the intent and direction of the installation. Items and their location are shown diagrammatic and are to be field verified by the contractor prior to completing work associated with the item.

B. All work shall be performed in strict accordance with all applicable laws, ordinances, codes of local, state and federal government, or other authorities having lawful jurisdiction. The contractor is required to verify all requirements.

C. The contractor shall furnish all required labor, material, and associated tools to facilitate the installation of all the access control/security equipment associated items specified herein and with respect to the design drawings without damage to the cables, associated items, and/or facilities.

D. Qualified personnel, utilizing state-of-the-art equipment and techniques shall complete all installation work.

E. All materials shall be installed in accordance with the manufacturer's specified recommendations and practices.

1.07 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Reference each product to a location on Drawings.
   1. Manufacturer's technical data for all material and equipment at the system and sub system level to be provided as part of the ACS.

B. Shop Drawings: Submit plans, elevations, sections, details, and attachments to other work.
   1. Indicate all system device locations on architectural floor plans. No other system(s) shall be included on these plans.
   2. Include full schematic wiring information on these drawings for all devices. Wiring information shall include cable type, conductor routings, quantities, and connection details at device.
   3. Include final door frame rough-in drawing for individual door openings.
   4. Include a complete ACS one-line, block diagram.
   5. Include a statement of the system sequence of operation.

1.08 CLOSE OUT DOCUMENTS

A. Operation and Maintenance Data new/updated devices: For electronic security system emergency, operation, and maintenance manuals.
   1. Provide one (1) set electronic format manuals including operating instructions, maintenance recommendations and parts list including wiring and connection diagrams modified to reflect as-built conditions.
   2. Manuals: Deliver final copies of the manuals within thirty (30) days after completing the installation test.
   3. The basics of the manuals shall include the following:
      a. The contents of the manual identified on the cover.
      b. Include names, addresses, and telephone numbers of the Contractor responsible for the installation and maintenance of the system and the factory representatives for each item of equipment for the system.
      c. The manuals shall have a table of contents and labeled sections. The final copies delivered after completion of the installation test shall include all modifications made during installation, checkout, and acceptance testing.
   4. There shall be a set of Functional, Hardware, Cybersecurity Hardening Guide and Software manuals.
   5. The functional manual shall identify the operational requirements for the system and explain the theory of operations, design philosophy, and specific functions. Include a description of hardware and software functions, interfaces, and requirements.
   6. The hardware manual shall describe the equipment furnished including:
      a. General description and specifications
      b. Installation and check out procedures
      c. Equipment layout and electrical schematics to the component level
      d. Alignment and calibration procedures
      e. Manufacturer’s repair parts list indicating sources of supply.
   7. The software manual shall describe the functions of software and include all other information necessary to enable proper loading, testing, and operation. This manual shall include:
      a. Definition of terms and functions.
      b. System use and application software.
      c. Initialization, startup, and exit.
      d. Reports generation.
      e. Details on forms customization and field parameters.
   8. As-Built Drawings: During system installation, the Contractor shall maintain a separate hard copy set of drawings and wiring diagrams of the ACS to be used for record drawings.

This set shall be accurately kept up to date by the Contractor with all changes and additions to the ACS. Copies of the final as-built drawings shall be provided to the end user in an acceptable AutoCAD (DWG/DXF) format.

a. Updated Passwords, IP address MAC addresses programming operation check list.
b. Door operation checklist confirming all door operate per owner requirements and 08 7100 specifications.

1.09 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. ACS manufacturer shall be an established organization with referenced and documented experience delivering and maintaining SMS of equal or higher sophistication and complexity as compared to the system detailed in this specification.
   2. ACS manufacturer shall employ at a minimum the following methods for quality assurance of component and assembly devices.
      a. Perform visual inspection of devices to verify assembly according to defined procedures. Perform end of line operational tests to ensure product functionality has been correctly configured.
   3. Perform individual functionality and system level regression testing to ensure compliance with product specifications. Perform single and multiple unit system tests to mimic end-user installation configurations. Utilize automated hardware and software testing to evaluate system performance under published operational loads and compare to published system capabilities.

B. Bidder Qualifications:
   1. At the time of the bid, the bidder shall have satisfactorily completed projects of a similar size, scope, and complexity as the system detailed in this specification. The bidder shall furnish written proof of experience from three (3) references and proof of current accreditation or certification by the manufacturer for required training for sales or installation or service of the ACS and associated devices.
   2. The bidder shall also be a factory authorized local service organization that shall carry a complete stock of parts and provide maintenance for the SMS and related systems under this contract. Local shall be defined as an area in a 125 mile radius of the installed location.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Match existing Continental hardware

B. No Engineer approved equal.

2.02 ACCESS CONTROL SYSTEM FIELD HARDWARE

A. Access Control System (ACS) Hardware: The ACS shall be equipped with the access control field hardware required to receive alarms and administer all access granted or denied decisions. This shall include but not be limited to: intelligent system controllers (ISC), reader controllers and general purpose input/output panels. All field hardware must be designed to meet UL 294 requirements. The ACS must be able to retrieve device serial numbers from all field hardware, excluding card readers, biometric readers, and keypads.

B. ACS Authentication Hardware:
   1. Contactless smartcard reader – multi-technology, mobile ready standalone credential readers:
      a. HID® Signo Reader 20 Mullion Mounted
      b. HID® Signo Reader 40 Single gang mounted
      c. HID® Signo Keypad Reader 20K Mullion Mounted
      d. HID® Signo Keypad Reader 40K Single gang mounted
      e. Refer to drawings and locations and quantities.

C. Proximity Cards:
   1. Provide Hughes Identification Devices (HID) proximity card. The manufacturer shall extend a lifetime warranty against defects in material and workmanship. Coordinate all card options including but not limited to: magnetic stripe, slot punch and numbering scheme with the Customer Name prior to ordering.
      a. Quantity: 100

D. Door Status Switch (DC):
   1. George Risk Industries (GRI) model 8080-TWG-B
   2. George Risk Industries (GRI) model 7623-TWG-G
   3. George Risk Industries (GRI) model 200-36
   4. Engineer approved equal

E. Overhead Door Position Switch
   1. GRI 4700-A2
   2. Engineer Approved Equal

F. Audible Alarm (ALM):
   1. System Sensor model MHW
   2. Engineer approved equal

G. Relays
   1. Air Products & Controls Model MR-101/C
   2. Omron model LY Series General Purpose Relays
   3. Engineer approved equal

H. Key Switch Stations
   1. SDC 701 Single Gang - Alternate Action SPDT
   2. SDC 701N Narrow - Alternate Action SPDT
   3. SDC 701T Double Gang - Alternate Action SPDT
   4. SDC 702 Single Gang - Momentary
   5. SDC 702N Narrow - Momentary
   6. SDC 702T Double Gang - Momentary
   7. SDC 705 Single Gang - Alternate Action DPDT
   8. SDC 705N Narrow - Alternate Action DPDT
   9. SDC 701T Double Gang - Alternate Action SPDT
   10. 1SDC 701TXRMB Double Gang - Audible Buzzer, Alternate Action SPDT
   11. Engineer approved equal

I. Duress Buttons (DB)
   1. Access Security Products model ASP-18
   2. Engineer approved equal

J. Door Release Buttons (REL)
   1. Access Security Products model ASP-18
   2. Engineer approved equal

K. Door Control panels
   1. ALARM CONTROLS CP-26AB
   2. Engineer approved equal

2.03 ELECTRICAL POWER REQUIREMENTS

A. System Power: The security management system shall operate using standard 120 volts AC power.

B. Battery Backup: A rechargeable 12VDC, gel-type, lead acid battery backup shall be provided for all intelligent system controllers, reader controllers, and general purpose input/output panels.

C. Provide a centralized power supply for all electronic locking hardware with the exception of all electrified panic bar locations. Coordinate power supply quantities with division 08 7100.
   1. Altronix
   2. Engineer approved equal.

2.04 SURGE PROTECTION

A. Provide Ethernet surge protection systems for all externally mounted network connections (PoE card readers, telephone entry systems, sensors).
   1. Externally mounted Ditek DTK-MRJPOEX
   2. Internally mounted Ditek DTK-MRJPOE

PART 3 EXECUTION

3.01 EXAMINATION

A. Submittals for review by design team confirms that the contract documents and site conditions are accepted without qualifications unless exceptions are specifically noted.

B. The site shall be visited on a regular basis to appraise ongoing progress of other trades and contracts, make allowances for all ongoing work, and coordinate the requirements of this contract in a timely manner.

C. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of electronic security system.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 SYSTEM INTEGRATION

A. Integrate electronic security system with the following systems and equipment:
   1. Electronic door hardware
   2. Fire Alarm
   3. Video Surveillance

3.03 INSTALLATION

A. Install system in accordance with manufacturer's installation instructions. The following conditions are applicable:
   1. In order to ensure a complete, functional system, for bidding purposes, where information is not available from the owner upon request, the worst-case condition shall be assumed.
   2. Interfaces shall be coordinated with the owner's representative, where appropriate.
   3. All necessary back boxes, pull boxes, connectors, supports, conduit, cable and wire shall be furnished and installed to provide a complete and reliable system installation. Exact location of all devices and wiring shall be presented to the owner for approval in advance of any installation.

B. The contractor shall install all system components and appurtenances in accordance with the manufacturer's instructions, and shall furnish all necessary interconnections, services, and adjustments required for a complete and operable system as specified and shown. Control signal, communications, and data transmission line grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation. Provide mounting hardware as required.

C. Technicians shall be certified by the manufacturer for the version of the product in place.

D. All inputs shall be protected against surges induced on device wiring. Outputs shall be protected against surges induced on control and device wiring installed outdoors and as shown. All communications equipment shall be protected against surges induced on any communications circuit. All cables and conductors which serve as communications circuits from security console to field equipment, and between field equipment, shall have surge protection circuits installed at each end.

E. Connect each field device with owner's data network as required. Coordinate each connection type and requirement with structured cabling contractor.

F. Wiring Method: Install wiring in metal raceways, except in accessible spaces and in interior hollow gypsum board partitions where cable may be used. Minimum conduit size shall be 1/2-inch. Control and data transmission wiring shall not share conduit with other building wiring systems.

3.04 CABLE

A. The access control system manufacturer shall approve and contractor shall install the low voltage cable. All low voltage electrical cable that is installed as part of the access control system shall be plenum rated cable where required.
   1. Contractor shall provide a composite security cable where applicable.

3.05 TESTING AND CERTIFICATION

A. This contractor shall demonstrate the functionality of the system, as defined by the matrix of responsibility on the plans and section 08 7100, upon completion of installation, documenting the result of all tests and providing these results to the owner. The system shall be tested in accordance with the following:
   1. This contractor shall conduct a complete inspection and test of all installed equipment. This includes testing and verifying connection to equipment of other divisions.
   2. This contractor shall provide staff to test all devices and all operational features of the system for witness by the owner's representative. The contractor shall provide two-way radio communications to assist in the testing. The owner's representative, prior to acceptance, must witness all testing.

B. The testing and certification shall take place as follows:
   1. System shall be tested in conjunction with the manufacturer's representative.
   2. All deficiencies noted in the above test shall be corrected.
   3. Test results shall be submitted to the consultant or owner's representative.
   4. System test witnessed by owner's representative and correction of any deficiencies noted.
   5. The owner's representative shall accept the system.
   6. A letter of certification shall be provided to indicate that the tests have been performed and all devices are operational.

3.06 FIELD QUALITY CONTROL

A. Test in accordance with NFPA 72.

3.07 WARRANTY

A. This contractor shall guarantee all of the apparatus, materials, equipment furnished, and labor installed under this contract for a period of one year after date of final acceptance.

3.08 MANUFACTURER'S LICENSING CONTRACT

A. This contractor shall update and maintain all system licensing of the installed hardware under this contract for a period of one year after date of final acceptance.

B. Contractor shall work with owner providing a yearly cost of any Software Subscription Agreement SSA associated with the licensing of the software.

END OF SECTION

SECTION 28 31 00
FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire alarm and smoke detection control panel
B. Voice evacuation panel
C. Peripheral devices
D. Fire alarm wire and cable
E. Fire/smoke dampers
F. Sprinkler flow and tamper switch
G. Flush Mount Fire alarm annunciator panel
H. Monitor and control modules
I. Cellular communicator

1.02 RELATED SECTIONS

A. Specification Section 08 7100 - Door Hardware
B. Specification Section 21 1300 - Fire Suppression Sprinkler System
C. Specification Section 21 2000 - Fire Extinguishing System
D. Specification Section 23 3100 - HVAC Ducts and Casing
E. Specification Section 23 3300 - Air Duct Accessories
F. Specification Section 23 3417 - High Volume, Low Speed Fans
G. Specification Section 26 0533 - Raceways and Boxes for Electrical Systems
H. Specification Section 27 4100 - Audio Video System
I. Specification Section 28 1300 - Access Control System

1.03 REFERENCES

A. NFPA 70 - National Electrical Code
B. NFPA 72 - National Fire Alarm Code
C. NFPA 101 - Life Safety Code
D. International Building Code
E. International Fire Code
F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems

1.04 SYSTEM DESCRIPTION

A. Provide and install a manual and automatic fire alarm system that shall meet or exceed current IBC/IFC code requirements in accordance with NFPA 72.
B. Fire alarm system shall include the system wiring, raceways, pull boxes, terminal cabinets, outlet and mounting boxes, control equipment, alarm and supervisory signal initiating devices, alarm notification appliances and other accessories required for a complete operating system.

1.05 SUBMITTALS

A. Shop Drawings: Provide a scaled building layout showing each device and wiring connection required.
B. Product Data: Provide electrical characteristics and connection requirements.
C. Test Reports: Indicate satisfactory completion of required tests and inspections.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation and starting of products.

E. Contractor shall submit software logic, flow diagrams, battery calculations and one line diagrams illustrating device loops.

F. Contractor shall be responsible for submitting a copy of these documents to the local Authority having jurisdiction or state for required review.

G. Submit copies of NICET certifications as described in this specification section.

1.06 PROJECT RECORD DOCUMENTS

A. Record actual locations of all initiating devices, signaling appliances, shut down relays, power supplies, and end-of-line devices. Illustrate each SLC loop that is planned.

B. Indicate device addresses on the drawings.

C. Deliver to owner as both hard copy and electronic file.

D. Place a document cabinet to hold asbuilts.

1.07 OPERATION AND MAINTENANCE DATA

A. Operation Data: Operating instructions.

B. Maintenance Data: Maintenance and repair procedures.

C. Configuration Data: Printouts of configuration settings for all devices.

D. Routine Maintenance Checklist.

1.08 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum ten years experience.

B. Contractor: The contractor shall have a fully equipped, factory trained, and manufacturer certified service and installation organization.

C. Supervisor: The job supervisor shall be a NICET Level II (or higher) technician and be a full-time employee of the certified reseller. Supervisor shall be responsible for programming and testing.

D. Technician: A fire alarm technician shall have a minimum of four years experience terminating and installing fire alarm systems. The technician shall also be factory trained in the installation, adjustment, testing and operation of the equipment specified. The technician shall be capable of answering trouble calls from a permanently maintained location less than 100 miles from project site.

E. Installer: The installer shall be a company specializing in installing the products specified in this section with minimum three years experience, a NICET certified installer and/or licensed electrician shall be allowed to install wire, cable, conduit and back boxes for the fire alarm system.

F. A list of technicians with any level of responsibility with this project shall be submitted for review and acceptance during the submittal process. A copy of their NICET Certification(s) shall be included.

1.09 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 72 and NFPA 101.

B. Furnish products listed and classified by UL, FM approved for purpose specified and indicated.

1.10 MAINTENANCE SERVICE

A. A maintenance program shall be offered to the owner at the end of the warranted period to meet NFPA requirements.

1.11 EXTRA MATERIALS AND LABOR

A. Provide 1 installed manual stations including 40 feet of wiring to be positioned by the owner or engineer.

B. Provide 3 installed automatic smoke detectors including 40 feet of wiring each per device to be positioned by the owner or engineer.

C. Provide 1 installed automatic heat detectors including 40 feet of wiring each per device to be positioned by the owner or engineer.

D. Provide 2 installed audible/visual alarms including 40 feet of wiring each per device to be positioned by the owner or engineer.

E. Provide 1 installed automatic combination detector including 40 feet of wiring each per device to be positioned by the owner or engineer.

F. Provide a minimum of six keys of each type.

G. Devices shall be installed at the direction of the owner or design team.

H. Any materials that are not used during construction shall be turned over to the owner at the final acceptance of the building.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Notifier (Basis of Design)

B. Honeywell (Gamewell FCI, Farenhyt)

C. Farenhyt

D. Edwards

E. Engineer approved equal.

2.02 FIRE ALARM AND SMOKE DETECTION CONTROL PANEL

A. The main FACP Central Console shall contain a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, control circuits, and notification appliance circuits, local and remote operator terminals, printers, annunciators, and other system controlled devices.

B. The Notifier Inspire N16x control panel shall be the basis of design.

C. In conjunction with intelligent Loop Control Modules and Loop Expander Modules, the main FACP shall perform the following functions:
   1. Supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions.
   2. Supervise all initiating signaling and notification circuits throughout the facility by way of connection to addressable monitor and control modules.
   3. Detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed. In the event of CPU failure, all SLC loop modules shall fallback to degrade mode. Such degrade mode shall treat the corresponding SLC loop control modules and associated detection devices as conventional two-wire operation. Any activation of a detector in this mode shall automatically activate associated Notification Appliance Circuits.
   4. Visually and audibly annunciate any trouble, supervisory, security or alarm condition on operator's terminals, panel display, and annunciators.
   5. When a fire alarm, trouble or supervisory condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
      a. The system alarm LED shall flash.
      b. A local piezo-electric audible device in the control panel shall sound a distinctive signal.

c. The 640-character backlit LCD display shall indicate all information associated with the condition, including the type of alarm point and its location within the protected premises.
d. All system outputs assigned via preprogrammed equations for a particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.

D. The control panel shall be capable of expansion via up to 2 SLC modules. Each module shall support a maximum of 318 analog/addressable devices for a maximum system capacity of 636 points. The system shall be capable of 2048 annunciator points per system regardless of the number of addressable devices.

E. The Fire Alarm Control Panel shall include a full featured operator interface control and annunciation panel that shall include a backlit liquid crystal display, individual, color coded system status LEDs, and a QWERTY style alphanumeric keypad for the field programming and control of the fire alarm system. Said LCD shall also support graphic bit maps capable of displaying the company name and logo of either the owner or installing company.

F. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.

G. The door shall provide a key lock and include a transparent opening for viewing all indicators. For convenience, the door shall have the ability to be hinged on either the right or left-hand side.

H. The control unit shall be modular in structure for ease of installation, maintenance, and future expansion.

I. Communicator
1. Universal Digital Alarm Communicator Transmitter
a. The HON-DACT-DS is capable of transmitting the status of software zones (Alarm and Trouble), System Trouble, Panel Off-Normal, Supervisory, Bell Trouble, Low Battery, and AC Fail.
b. Dual phone lines with line voltage detect.

2.03 VOICE EVACUATION PANEL

A. The voice evacuation panel located with the FACP, shall contain all equipment required for all audio control, emergency telephone system control, signaling and supervisory functions. This shall include speaker zone indication and control, telephone circuit indication and control, digital voice units, microphone and main telephone handset.

B. The Notifier Inspire Digital Voice Command Center shall be the basis of design.

C. Function: The Voice Command Center equipment shall perform the following functions:
1. Operate as a supervised multi-channel emergency voice communication system.
2. Operate as a two-way emergency telephone system control center.
3. Audibly and visually annunciate the active or trouble condition of every speaker circuit and emergency telephone circuit.
4. Audibly and visually annunciate any trouble condition for digital tone and voice units required for normal operation of the system.
5. Provide all-call Emergency Paging activities through activation of a single control switch.
6. As required, provide vectored paging control to specific audio zones via dedicated control switches.
7. Provide a factory recorded "library" of voice messages and tones in standard WAV. File format, which may be edited and saved on a PC running a current Windows® operating system.
8. Provide a software utility capable of off-line programming for the VCC operation and the audio message files. This utility shall support the creation of new programs as well as

editing and saving existing program files. Uploading or downloading the VCC shall not inhibit the emergency operation of other nodes on the fire alarm network.

9. The Digital Voice Command and associated equipment shall be protected against unusually high voltage surges or line transients.

2.04 PERIPHERAL DEVICES

A. Fire Sensors:
   1. All fire sensors shall mount on a common base to facilitate the changing of sensor type if building conditions change.
   2. Each sensor shall have the capability to be tested for alarm from the sensor location.
   3. Each sensor shall be capable of being tested for alarm via command from the transponder.
   4. Each sensor shall respond to transponder scan for information with its type identification to preclude inadvertent substitution of another sensor type.
   5. The transponder shall operate with the installed type but shall initiate mismatch (trouble) condition until the proper type is installed or programmed sensor type changed.
   6. Each sensor shall respond to transponder scan for information. Such response proves end-to-end sensor response including the operation of the sensor electronics.
   7. Provide an addressable relay to control a 110-volt solenoid valve, which holds water off. See detail on the drawings. This is for sprinkler flow switches at elevator.

B. Manual Fire Alarm Stations:
   1. Design based on Notifier NBG-12LX or equal.
   2. Fire alarm pull station with red Lexan body, semi-flush mounted.

C. Automatic Smoke Detectors:
   1. Design based on Notifier FSP-951 or equal.
   2. Photo-electric smoke sensors.

D. Thermo-Detectors:
   1. Design based on Notifier FSP-951 or equal.
   2. Area thermo-detectors shall be 135 degree rat-of-rise fixed type and shall cover 2500 sq. ft.

E. Monitor Modules:
   1. Design based on Notifier FMM-101 or equal.
      a. The monitor module shall provide an addressable input for N.O. or N.C. contact devices such as manual stations, water flow switches, sprinkler supervisory devices, etc.
      b. The monitor module shall provide a supervised initiating circuit. An open circuit fault shall be annunciated at the transponder. Subsequent alarms shall be reported.
   2. Design based on Notifier FMM-1 or equal.
      a. The monitor module shall provide an addressable input for dry contact devices such as heat detectors and pull stations, or monitor and power a circuit of two-wire smoke detectors.

F. Relay Modules:
   1. Design based on Notifier FRM-1.
   2. The control module shall provide an addressable output for a separately powered alarm indicating circuit for a control relay.
   3. The control module shall provide a supervised indication circuit where indicated on the drawings. An open circuit fault shall be annunciated at the transponder. Subsequent alarm signaling shall occur in spite of the fault condition.

G. Duct Smoke Detectors:
   1. Design based on Notifier XXX or equal.

a. Notifier DNR - Housing
b. Notifier FSP-951R - Detector
c. Notifier DSTS - Sampling Tube
d. Notifier RTS-151KEY - Remote Test Station

2. Furnish and install duct smoke detectors in supply and return air ducts for all the air handling units with fan shutdown relays.
3. Provide remote key resets for these detectors. Coordinate installation location with design team prior to rough-in.

H. Detector Bases:
1. Design based on Notifier B300-6 or equal.
2. Flanged mounting base for intelligent detectors.

I. Intelligent Sounder Bases:
1. Design based on Notifier B200S-LF-WH or equal.
2. Intelligent addressable low frequency sounder base capable of high sound output. (>85dBA)

J. Combination Detectors:
1. Design based on Notifier FCO-951 or equal.
2. Addressable, multi-criteria carbon monoxide/smoke detector.

K. Control Modules:
1. Design based on Notifier FCM-1 or equal.
2. Addressable control module for indication devices.

L. Remote Testing Switches:
1. Design based on Notifier RTS-151KEY or equal.
2. **Remote test station, designed to test duct smoke detectors from a convenient location. Coordinate installation location with design team prior to rough-in.**

M. Horn/Strobe Indicators:
1. Design based on Notifier system sensor or equal.
a. P2WLED - Wall mount, white.
b. PC2WLED - Ceiling mount, white
2. Contractor shall coordinate color with design team.
3. Mounted to comply with Americans with Disabilities Act.
4. Flush mounted unit shall have thermoplastic faceplate, trim shall have the word "ALERT".
5. Visual Alarm Light: Xenon Light.

N. Strobes:
1. Design based on Notifier system sensor or equal.
a. SWLED - Wall mount, white.
b. SCWLED - Ceiling mount, white.
2. Flush mounted unit shall have thermoplastic faceplate, trim shall have the word "ALERT".
3. Contractor shall coordinate color with design team.
4. Mounted to comply with Americans with Disabilities Act.
5. Strobes shall feature field-selectable candela settings of 15, 30, 75, 95, 110, and 177.
6. Strobe candela level shall be adjusted as required to meet coverage requirements. Revision of locations to meet code shall be done as needed in coordination with design team.

O. Speakers:
1. Design based on Notifier system sensor or equal.
a. SPWL - Wall mount, white.
b. SPCWL - Ceiling Mount, White.
2. Flush mounted unit shall have thermoplastic faceplate, trim shall have the word "ALERT".
3. Contractor shall coordinate color with design team.

4. Mounted to comply with Americans with Disabilities Act.
5. Speaker tap shall be adjusted as required to meet intelligibility requirements. Revision of locations to meet code shall be done as needed in coordination with design team.

P. Speaker Strobes:
1. Design based on Notifier SPS(A)L or equal.
   a. SPSWLED - White.
   b. SPSCWLED - Ceiling mount, White.
2. Contractor shall coordinate color with design team.
3. Mounted to comply with Americans with Disabilities Act.
4. Speaker tap shall be adjusted as required to meet intelligibility requirements. Revision of locations to meet code shall be done as needed in coordination with design team.
5. Strobes shall feature field-selectable candela settings of 15, 30, 75, 95, 110, and 177.
6. Strobe candela level shall be adjusted as required to meet coverage requirements. Revision of locations to meet code shall be done as needed in coordination with design team.

2.05 FIRE ALARM WIRE AND CABLE

A. Fire Alarm Power Branch Circuits: Building wire as specified by the manufacturer.

B. Initiating Device and Indicating Appliance Circuits: All fire alarm wiring shall be in metallic conduit or open raceway system concealed in finished areas as specified. Wiring shall be as specified by the manufacturer.

2.06 FIRE/SMOKE DAMPERS

A. Electrical contractor shall provide and install 120 volt wiring for smoke dampers. Fire alarm contractor shall provide and install code compliant detection at each fire/smoke damper or smoke damper. Fire alarm contractor shall coordinate signal from Fire Alarm panel to HVAC control system to shut down associated units.

B. Where a damper is installed within an un-ducted opening in a wall, a smoke detector shall be installed within 5 feet of the damper.

C. Dampers shall be controlled/monitored by the fire alarm system via addressable relays and monitor modules that interrupt power to the damper. Dampers shall close when power is removed. Direct control from duct detector relays is not allowed. One fire alarm addressable relay may control multiple dampers but shall only be grouped for the same air handling unit equipment. Damper power circuit shall be on the same electrical branch as the associated air handling equipment, when on emergency power, the same transfer switch shall serve the air handling equipment and associated dampers

D. Dampers shall close when associated air handling equipment is shut down. A relay provided by the T.C.C. shall initiate damper closure though a dedicated fire alarm monitor module. Fire alarm programming shall associate monitor module(s) with respective damper operation.

E. Dampers that close more than 80% of air from an air handling unit (AHU) shall be interlocked with AHU shutdown programming and shall provide an appropriate delay to allow sufficient time (usually 120 seconds) to allow AHU fans to slow down prior to damper closure to prevent high-static pressure trips. Delays shall be initiated by the building automation system, provide additional control relays to achieve delays and inhibit signals.

F. All smoke damper circuits shall be dedicated.

G. See the mechanical and electrical drawings for damper locations.

H. Provide remote test switch associated with each fire/smoke and smoke damper.

2.07 SPRINKLER FLOW AND TAMPER SWITCH

A. This contractor is responsible to wire all flow and tamper switches on all valves provided by the sprinkler contractor.

2.08 FIRE ALARM ANNUNCIATOR PANEL (FAAP)

A. Furnish and install where indicated on the drawings a remote annunciator panel. Panel shall provide alarm/trouble/reset capabilities to match main control panel information and features.

B. Design based on Notifier RLD.

2.09 MONITOR AND CONTROL MODULES

A. This contractor is responsible to provide all necessary components and wiring for service to approved HVAC equipment 2000 cfm (and larger), approved kitchen hoods and approved fire suppression services. Coordinate exact requirements with HVAC, kitchen equipment, and fire suppression contractors.

2.10 CELLULAR COMMUNICATOR

A. Design based on Notifier STARLINK SLE-MAX2-CFB, SLE-FIRE-VR.

B. Contractor shall confirm preferred Service with design team: AT&T or Verizon.

C. Provide other accessories as required for a functional, code-compliant system.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install devices according to NFPA 72. Manual station with operating handle 48 inches on center above finished floor. Install combo audible and visual signal devices 90 inches above floor or six inches (6") below ceiling, whichever is lower and in accordance with ADA Guidelines.

C. Automatic Detector Installation: Conform to NFPA 72.

D. Assist owner in providing cellular service to cellular dialer 4 weeks prior to substantial completion.

E. This contractor shall be responsible for installing an indication system that meets or exceeds the required strobe intensity per NFPA 72.

F. This contractor shall be responsible for installing an indication system that meets or exceeds the required speech transmission index level per NFPA 72. Adjust tap settings on all speakers as required.

G. Provide and install monitor modules required to successfully monitor all planned Ansul, pre-action sprinkler and/or clean agent suppression systems.

H. Detector should not be located in areas with excessive exhaust fumes, kitchen areas, near fireplaces or furnace rooms and within three feet (3') of air supply ducts, air diffusers, or ceiling fans.

I. Coordinate with design team to ensure signage is provided per code on door of room housing the Fire Alarm Control Panel.

J. This contractor is responsible to provide all necessary components and wiring for service to approved HVAC equipment 2000 cfm (and larger), approved kitchen hoods and approved fire suppression services. Coordinate exact requirements with HVAC, kitchen equipment, and fire suppression contractors.

K. This contractor is responsible to provide all necessary components and wiring for service to mute Sound Masking, Audio and Paging Systems:
   1. Connect Fire Alarm Control Unit (FACU) to the audio system utilizing a supervised line and addressable relays, per NFPA 72, to shut down and effectively mute all sound masking, audio and paging systems.
   2. The FACU and associated supervised lines to meet UL 2572 ensuring the shutdown mechanism is properly supervised and is reliable and will in no way damage the FACU or audio system.

3. The FACU and associated relays must not introduce any noise into the sound masking, audio or paging system.
4. Muting ambient sound during an emergency is necessary to meet ADA suggested guidelines and NFPA acoustic requirements.

3.02 ELECTRICAL REQUIREMENTS

A. All wiring shall be concealed within walls. No exposed raceways except areas with exposed structure. Coordinate conduit routing with the architect. Provide conduit for wiring located in non-accessible areas. In areas with accessible ceilings, use j-hooks as specified. Provide sleeves through walls and floors (3/4 inch minimum). Do not exceed a 40% pipe fill.

B. Minimum 3/4 inch conduit size.

C. Fire alarm cable installed in conduit shall not be shared by any other low voltage system cable.

D. All cable terminations shall be located within the devices itself or in a junction box. Exposed splices are not acceptable.

E. Make conduit and wiring connections to door release devices, sprinkler flow switches, and sprinkler valve tamper switches. This contractor is responsible for all wiring and conduit to the sprinkler system post indicating valve, when this valve is provided. See drawings for location.

F. Provide and Install insulated bushing on end of raceways.

G. Mount outlet box for magnetic door holder to withstand 80 lbs pulling force.

H. All fire alarm devices, junction and pull boxes shall be installed so they are easily accessible without removing light fixtures, equipment, conduits, junction boxes or other items.

I. Provide locking breaker on 120 VAC power source and label "Fire Alarm." Locking breaker shall be painted red. Any power source to FACP or devices shall be labeled with location of Power source for room number, panel and circuit number.

J. Fire alarm control and remote power panel’s power shall be supplied by a surge protected dedicated circuit(s).

K. Auxiliary functions that are powered from a remote source must be monitored for power if they do not go to the operational mode for fire protection. (i.e. A power opener purge door that must open to purge air through building or a stairway air pressurization fan that must be monitored for power in case the breaker is shut off.)

L. Building has generator backup connected to fire alarm panel. Provide battery backup able to power the entire system for 4 hours. Refer to NFPA 72 for additional information.

3.03 FIELD QUALITY CONTROL

A. Test in accordance with NFPA 72.

B. Upon completion of the fire alarm system installation, the contractor shall provide a written statement advising the architect of completion and to be in compliance with fire and electrical codes, and in accordance with wiring diagrams, instructions and directions provided by the manufacturer.

C. Representative of the manufacturer shall certify the system complete and that the owner has received adequate instructions in system operation.

3.04 MANUFACTURER'S FIELD SERVICES

A. Prepare and start systems.

B. Include services of certified technician to supervise installation, adjustments, final connections and system testing.

3.05 DEMONSTRATION

A. Demonstrate normal and abnormal modes of operation and required responses to each.

3.06 CABLE

A. The fire alarm system manufacturer shall approve the low voltage cable and cable size. All low voltage electrical cable, which is installed as part of the new fire alarm system shall be plenum rated.

B. The cable that is installed without using raceway shall be neatly routed and supported every three feet (3'). All wiring in mechanical rooms shall be in conduit.

C. All exposed wiring shall be in raceway.

D. No cable shall be allowed to lie on the accessible ceiling tile.

E. Cable associated with smoke control or stairwell pressurization systems shall be installed in continuous raceway.

3.07 CERTIFICATION

A. The fire alarm system shall be installed and operating within the manufacturers defined parameters and be certified by the manufacturer’s representative’s signature.

B. Certification shall be turned over to the owner prior to closing of this project.

3.08 EXISTING FIRE ALARM STATUS

A. The electrical contractor shall document all alarms associated to the fire alarm system and contact owner prior to performing general demolition.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and protection of vegetation.

B. Removal of existing debris.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.

D. Section 31 22 00 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

E. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

F. Section 31 23 23 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

G. Section 32 92 19 - Seeding.

1.03 SUBMITTALS

A. Site Plan: Showing:
   1. Vegetation removal limits.
   2. Areas for temporary construction and field offices.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SITE CLEARING

A. Comply with other requirements specified in Section 01 70 00.

B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are not to be removed.

E. Abandonment and removal of existing structures and below grade infrastructure. Notify the Owner and Design Team of existing structures; footings, foundations or infrastructure; pipes conduit, pipes, wire, cable, tanks, other that are encountered and not shown on the drawings. Resulting direction will be documented as change direction with tentative action being to remove each item only to the extent needed for Work of current project after confirmation each item has been abandon/no longer in use.

3.03 VEGETATION

A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, playing fields, lawns, and planting beds.

B. Do not begin clearing until vegetation to be relocated has been removed.

C. Do not remove or damage vegetation beyond the limits indicated on drawings.

D. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
   1. At vegetation removal limits.

E. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.

F. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
   1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
   2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   3. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.

G. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

3.04 DEBRIS

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 31 22 00
GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of topsoil.

B. Rough grading the site for site structures.

C. Finish grading.

1.02 RELATED REQUIREMENTS

A. Section 31 10 00 - Site Clearing.

B. Section 31 23 16 - Excavation.

C. Section 31 23 23 - Fill: Filling and compaction.

D. Section 32 92 19 - Seeding: Finish ground cover.

1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: See Section 31 23 23.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

B. Verify the absence of standing or ponding water.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.

D. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

E. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.

F. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.

3.03 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Do not remove wet subsoil , unless it is subsequently processed to obtain optimum moisture content.

E. When excavating through roots, perform work by hand and cut roots with sharp axe.

F. See Section 31 23 23 for filling procedures.

G. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key fill material to slope for firm bearing.

H. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

I. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.

3.04 SOIL REMOVAL

A. Stockpile excavated topsoil on site. '"

B. Stockpile excavated subsoil on site. '"

C. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; protect from erosion.

3.05 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

D. Place topsoil in areas where seeding are indicated.

E. Place topsoil where required to level finish grade.

F. Place topsoil to the following compacted thicknesses:
   1. Areas to be Seeded with Grass: 6 inches.
   2. Shrub Beds: 18 inches.
   3. Flower Beds: 12 inches.
   4. Planter Boxes: To within 3 inches of box rim.

G. Place topsoil during dry weather.

H. Remove roots, weeds, rocks, and foreign material while spreading.

I. Near plants spread topsoil manually to prevent damage.

J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

K. Lightly compact placed topsoil.

L. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.06 REPAIR AND RESTORATION

A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

B. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

3.07 FIELD QUALITY CONTROL

A. See Section 31 23 23 for compaction density testing.

3.08 CLEANING

A. Remove unused stockpiled topsoil and subsoil.'" Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 31 23 16
EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.

B. Trenching for utilities outside the building to utility main connections.

C. Temporary excavation support and protection systems.

1.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring. General requirements for dewatering of excavations and water control.

B. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal.

C. Section 31 22 00 - Grading: Soil removal from surface of site.

D. Section 31 22 00 - Grading: Grading.

E. Section 31 23 16.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

F. Section 31 23 23 - Fill: Fill materials, backfilling, and compacting.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Temporary Support and Excavation Protection Plan.

C. Project Record Documents: Record drawings at project closeout according to 01 70 00 - Execution and Closeout Requirements. Show locations of installed support materials left in place, including referenced locations and depths, on drawings.

D. Field Quality Control Submittals: Document visual inspection of load-bearing excavated surfaces.

PART 2 PRODUCTS

2.01 MATERIALS

A. Bedding and Fill to Correct Over-Excavation:
   1. See Section 31 23 23 for bedding and corrective fill materials at general excavations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the work are as indicated.

B. Survey existing adjacent structures and improvements and establish exact elevations at fixed points to act as benchmarks.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 31 10 00 for clearing, grubbing, and removal of existing debris.

C. See Section 31 22 00 for topsoil removal.

D. Locate, identify, and protect utilities that remain and protect from damage.

E. Notify utility company to remove and relocate utilities.

F. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

G. Protect plants, lawns, and other features to remain.

H. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Design Professional.

3.03 EXCAVATING

A. Excavate to accommodate new structures and construction operations.

B. Notify Design Professional of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Provide temporary means and methods, as required, to remove all water from excavations until directed by Design Professional. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.04 FILLING AND BACKFILLING

A. Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation.

B. See Section 31 23 23 for fill, backfill, and compaction requirements at general excavations.

C. See Section 31 22 00 for rough and final grading and topsoil replacement requirements.

3.05 REPAIR

A. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 23 23.

3.06 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces by Design Professional before placement of foundations.

END OF SECTION

SECTION 31 23 23
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade, footings, slabs-on-grade, paving, and utilities within the building.

B. Backfilling and compacting for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 31 22 00 - Grading: Removal and handling of soil to be re-used.

C. Section 31 22 00 - Grading: Site grading.

D. Section 31 23 16 - Excavation: Removal and handling of soil to be re-used.

1.03 REFERENCE STANDARDS

A. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017 (Reapproved 2025).

1.04 SUBMITTALS '"

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

1.05 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where indicated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Subsoil excavated on-site.
   1. Graded.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   3. Complying with ASTM D2487 Group Symbol CL.

B. Structural Fill: Subsoil excavated on-site.
   1. Graded.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   3. Complying with ASTM D2487 Group Symbol CL.

C. Granular Fill - Gravel : Pit run stone; free of shale, clay, friable material and debris.

D. Topsoil: See Section 31 22 00.

2.02 ACCESSORIES

A. Geotextile: Non-biodegradable, woven.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the Work are as indicated.

B. Identify required lines, levels, contours, and datum locations.

C. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

D. Verify structural ability of unsupported walls to support imposed loads by the fill.

E. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.

G. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

H. Correct areas that are over-excavated.
   1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.
   2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

I. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under slabs-on-grade and load bearing building features: Percent maximum dry density as required to provide minimum bearing pressure of 1,500 PSF.

J. Reshape and re-compact fills subjected to vehicular traffic.

K. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Design Professional. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.04 FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Structural Fill:
   1. Maximum depth per lift: 6 inches, compacted.
   2. Compact to minimum 95 percent of maximum dry density.

C. Under Interior Slabs-On-Grade:
   1. Use granular fill.
   2. Compact to 95 percent of maximum dry density.

D. At Foundation Walls and Footings:
   1. Use general fill.
   2. Fill up to subgrade elevation.
   3. Compact each lift to 90 percent of maximum dry density.
   4. Do not backfill against unsupported foundation walls.

5. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.

E. Over Subdrainage Piping at Foundation Perimeter and Under Slabs:
   1. Drainage fill and geotextile: Section 31 05 19.
   2. Cover drainage fill with general fill.
   3. Fill up to subgrade elevation.
   4. Compact to 95 percent of maximum dry density.

F. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches:
   1. Bedding: Use general fill.
   2. Cover with general fill.
   3. Fill up to subgrade elevation.
   4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

G. At Lawn Areas:
   1. Use general fill.
   2. Fill up to 6 inches below finish grade elevations.
   3. Fill up to subgrade elevations.
   4. Compact to 95 percent of maximum dry density.
   5. See Section 31 22 00 for topsoil placement.

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.06 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

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SECTION 31 63 29
DRILLED CONCRETE PIERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavation and construction of drilled concrete piers as shown on the drawings or specified herein.

B. Furnish and install all **reinforcing steel and other accessories** as shown on the drawings or specified herein.

C. Structural notes indicated on the drawings regarding drilled concrete piers shall be considered a part of this specification.

1.2 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 10 00 - Concrete Formwork.

C. Section 03 20 00 - Concrete Reinforcement.

D. Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any other pertinent codes or standards conflict with this specification, the more stringent provision shall govern.

1. AASHTO M36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains.
2. ACI 336.1 - Specification for the Construction of Drilled Piers.
3. ASTM A36 - Standard Specification for Carbon Structural Steel.
4. ASTM A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
5. ASTM A929 - Standard Specification for Sheet Steel, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe.
6. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

1.4 TESTING

A. Drilled Pier Testing Requirements:

1. **Special** Inspection Agency shall keep a record or log of each drilled pier as installed. Records shall show location, top and bottom elevations, shaft and bell diameters, date drilled pier is poured, type of strata encountered**, depth of test holes, location of any lenses of water, if present,** and any other pertinent information. A copy of this record shall be submitted to the Architect and Structural Engineer for their record files.

2. Contractor shall schedule and provide time and means for the **Special** Inspection Agency to inspect, take samples and make tests.
3. **Special** Inspection Agency shall determine the final bearing elevations and bearing capacities of the drilled piers based on the conditions encountered in the excavation.
4. Probe holes shall be drilled to determine the continuity and bearing capacity of the rock stratum.
5. Conduct tests on the first three drilled piers bearing on rock stratum and additional tests as directed.

1.5 QUALITY ASSURANCE

A. All drilled piers shall be installed by a Contractor specializing in the installation of drilled piers, and who have documented experience in the field of drilled pier construction.

1.6 BID REQUIREMENTS

A. Drilled Pier Quantity: Determine the quantity of concrete drilled piers as indicated on the drawings.

B. Drilled Pier Length: Base the length of the concrete drilled piers on the datum elevations scheduled on the drawings. The elevation identifying the bottom of the shaft is an approximate length for estimating purposes only. The actual length will be determined in the field from the actual elevation of the bearing stratum to be verified by the **Special** Inspection Agency.

C. The Drilled Pier Contractor shall examine the construction site and conditions under which piers are to be installed and notify the Contractor/Construction Manager and Architect in writing prior to bidding of any conditions detrimental to proper and timely completion of the work.

D. Unit prices shall be included in the contractors bid and bid documents and issued to the Architect prior to construction as part of the submittal package.

E. Adjustments in the contract price will be made due to changes in the number and length of drilled piers, based on unit prices established in this Agreement as follows:

1. Payment for drilled piers will be made on actual net volume of drilled piers in place and accepted. Actual length and shaft diameter may change due to job conditions. Adjusted payment will be made based on net variations to the total quantities, based on design dimensions.
2. Provide the following unit costs if additions to, or deductions from, work are required and authorized in writing by the Architect/Engineer:

    a. Additional length of drilled pier ($/per cubic yard)
    b. Subtracted length of drilled pier ($/per cubic yard)

Soil excavation ($/per cubic yard)
Rock excavation ($/hr.)
Removal of obstructions ($/hr.)

1.7 SUBMITTALS

A. Shop drawings:

1. Prepare and submit reinforcing steel shop drawings in accordance with Section 03 20 00.
2. Prepare and submit concrete mix design in accordance with Section 03 30 00.
3. Upon request, prepare and issue submittals listed in ACI 336.1

4. Submit unit costs outlined in Article 1.6.

B. Post Construction:

1. The **Special** Inspector shall prepare and submit the drilling log or record as described earlier to the Architect and one file copy to the Structural Engineer.
2. Prepare and submit results of tests and inspections.
3. Submit the completed log of each drilled pier installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be transported, stored and erected in a manner that will prevent damage or deformation

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete shall be as specified in Section 03 30 00 of this specification.

1. Concrete compressive strength: As indicated on the drawings.
2. When steel casing is utilized and removed during concrete installation, a minimum 6-inch slump concrete using a water-reducing admixture shall be used to prevent arching of concrete as casing is withdrawn.

B. Concrete reinforcement shall be as specified in Section 03 20 00 of this specification.

C. Temporary Casings: Provide temporary casings of sufficient strength to withstand handling stresses, drilling stresses, concrete pressure and surrounding earth and water pressures, or if required for protection of personnel or to permit advancement of shaft through unstable strata.

Permanent Casings: Permanent steel casings shall be ASTM A283, Grade C, ASTM A36, or ASTM A929, 1/2" minimum wall thickness. Furnish full penetration welds meeting AWS D1.1 requirements for joints in non-corrugated permanent casings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Contractor/Construction Manager shall conduct all excavating, filling, and grading necessary to leave site ready to receive pier work.

B. Situate equipment to not cause damage to adjacent structures. Contractor/Construction Manager shall arrange for protection of adjacent structures from damage if required.

C. Drilled Pier Contractor shall be responsible for all shoring, cribbing, and planning necessary or required for supporting and manipulating their equipment.

D. Where unstable or unsuitable soils are located, equipment supports shall be kept at least 10 feet away from the pier location to prevent compression or shearing of soil at the top of the pier wall.

E. In the event that the Contractor hits obstructions which cannot be removed with standard soil drilling tools, the Contractor shall seek approval from the Architect to remove the obstruction on a unit price basis. An obstruction shall be defined as any object, (boulder, rock, concrete, etc.) which prevents the drilled pier construction with standard soil drilling equipment. **Special** Inspector shall determine if objects encountered are classified as obstructions.

3.2 FIELD MEASUREMENT

A. Contractor/Construction Manager shall field locate each pier relative to the building lines and column centerlines.

3.3 INSTALLATION

A. Drilled piers shall be constructed as indicated on the drawings, and in accordance with ACI 336.1.

B. The drilled piers shall be accurately centered at the proper location and installed plumb.

C. When the shaft excavation is complete, the bottom of the shaft and bearing of the drilled pier shall bear directly on a solid rock formation. Socket all drilled piers a minimum **as indicated on the drawings** into the rock formation.

D. Debris shall be removed from the bottom of the shaft by mechanical methods and not by the trade contractor's personnel. At no time shall any field personnel access the drilled pier excavation.

E. The **Special** Inspection Agency shall verify bearing capacity at each pier. The **Special** Inspection Agency shall examine the spoil material from the excavation to determine if bearing stratum reached is suitable or if additional drilling is required.

F. Remove and dispose of excavated material as directed in Division 31 of this specification.

G. Place steel casing in shaft during drilling to protect the excavation from collapse and the displacement of unstable earth.

H. Allow inspection of **shaft and casing** prior to placement of **reinforcement and concrete**.

I. Fabricate and install reinforcing as one continuous unit as indicated on the drawings.

J. Install reinforcement in accordance with Section 03 20 00 of this specification.

K. Test concrete in accordance with Section 03 30 00 of this specification.

L. Install acceptable concrete in accordance with Section 03 30 00 of this specification with equipment designed for the vertical placement of concrete. Concrete shall be placed immediately after shafts are cleaned, data is recorded, and approval of the bearing surface is obtained.

M. Excavations shall not be left open overnight.

N. Use templates to set all anchor bolts, leveling plates and dowel bars required or indicated on the drawings.

O. Install dowels for connection of **grade beams and concrete piers** as indicated on the drawings.

P. Remove any water from the shaft prior to concrete placement.

Q. Progressively remove temporary steel casing as concrete is installed. Do not permit the top of the drilled pier to deform during casing removal.

R. Place concrete continuously without interruption, vibrating at least the top five feet of each shaft after temporary casing has been removed.

S. Free-fall of concrete shall be adequate to ensure compaction. Utilize tremie equipment to direct the concrete vertically down the shaft without hitting the sides.

Fill void spaces between permanent casings and shaft excavation with fluid sand-cement grout.

3.4 TOLERANCES

A. The maximum variation in top elevation of the center of any drilled pier shall be plus 1 inch and minus 3 inches at the cut off elevation.

B. The drilled piers shall not be out of plumb more than 1%.

C. The maximum variation from true centerline alignment shall be 1 inch for diameters of 18 inches or less, and 3 inches for diameters greater than 18 inches.

D. Any drilled piers out of center or plumb beyond the tolerances noted shall be corrected to the Architect/Engineer's satisfaction at no additional cost.

E. Excavate the bottom of the pier to a level plane within a tolerance of 1 inch vertical to 12 inches horizontal or as acceptable to the **Special** Inspection Agency.

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SECTION 32 16 23
SIDEWALKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks.

B. Concrete wheelchair ramps.

1.02 REFERENCE STANDARDS

A. ACI 211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.

B. ACI 305R - Guide to Hot Weather Concreting; 2020.

C. ACI 306R - Guide to Cold Weather Concreting; 2016.

D. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

F. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2026c.

G. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2025.

H. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2025.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings:

1.04 FIELD CONDITIONS

A. Temperature Requirements: Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

B. Follow recommendations of ACI 305R and ACI 306R when concreting during hot and cold weather, respectively.

C. Follow recommendations of polymeric sand manufacturer.

PART 2 PRODUCTS

2.01 CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS

A. Gravel Subbase: 2 inch.

B. Concrete Forms: Contractor's option; wood or steel.

C. Concrete Materials: Comply with ASTM C94/C94M.

D. Aggregate: Pit Run, washed, 3/8 inch (1 cm) stone; free of shale, clay, friable material and debris.

E. Reinforcement:
   1. Steel Welded Wire Reinforcement: ASTM A1064/A1064M, plain type, flat sheets, unfinished.

F. Joint Filler: Preformed expansion, with a thickness of 1/2 inch.

G. Curing Compound: Synthetic, Type 1, Class A, according to ASTM C309.

H. Surface Sealer: Topical, Type 1 , Class A, according to ASTM C1315.

I. Tactile Warning Surfaces: At locations indicated or as required to meet current SUDAS standard requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify gradients and elevations of the subgrade are correct as shown on drawings. Where poor subgrade material is encountered, remove and replace with suitable material.

B. Verify compacted subgrade is acceptable, ready to support imposed loads and paving, and ready to receive work.

3.02 SUBBASE PREPARATION

A. Maintain subgrade in a smooth, compacted condition with required section and established grade until concrete is placed.

3.03 CONCRETE SIDEWALK AND WHEELCHAIR RAMP INSTALLATION

A. Mixing:
   1. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
   2. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

B. Forming:
   1. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
   2. Sidewalk Forms: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Height equal to the full depth of the finished sidewalk.
   3. Wheelchair Ramps: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Comply with ADA Standards.
   4. Coordinate with adjacent Work and embed items; Expansion and filler material where abutting structures, embed posts for railings, signage, bollards, utilities passing under or through.

C. Reinforcement:
   1. Place wire-mesh reinforcement mid-height of forms.

D. Placement:
   1. Place concrete in a single lift.
   2. Consolidate concrete by tamping and spading.

E. Joints:
   1. Spacing: Provide scored joints every 10 feet (3 m).
   2. Filler height equal to the full depth of the finished concrete.

F. Finishing:
   1. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge, 1/4 inch radius.
   2. Wheelchair Ramps: Broomed perpendicular to slope.
   3. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
   4. Place surface sealer on exposed concrete surfaces after hardening. Apply in accordance with manufacturer's instructions.

3.04 TOLERANCES

A. Surface Flatness: 1/4 inch, maximum, measured with 10 foot straight edge.

B. Variation from True Position: 1/4 inch, maximum.

C. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.

3.05 PROTECTION

A. Immediately after placement, protect sidewalk from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian traffic over sidewalk for 7 days minimum after finishing.

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SECTION 32 92 19
SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Seeding, mulching and fertilizer.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading: Topsoil material.

B. Section 31 22 00 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.

C. Section 31 23 23 - Fill: Topsoil material.

1.03 SUBMITTALS

A. Product Data: Provide seed mixture product information including: grass see mix,

B. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

B. Review proposed seed mixture with authority having jurisdiction as applicable. Provide compliance and record documentation when required.

2.02 SEED MIXTURE

A. Seed Mixture and Species: Match existing adjacent.

B. State-certified seed of the latest season's crop. Deliver in original sealed packages bearing the producer's guaranteed analysis for percentages of mixtures, purity, germination, weed and seed content, and inert material. Label the packages in conformance with the U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. On-site seed mixing shall be done only in the presence of the Engineer.

C. The origin shall be clearly identified on the seed label for all seed types, including native forbs.

D. Permanent Lawn Mixture: Used for residential and commercial turf site, fertilized, and typically mowed. Use between March 1 and May 31 and between August 10 and September 30.

Common Name	Application Rate (lb/acre)
Creeping red fescue*	25
Turf-type perennial ryegrass**	20
Turf-type perennial ryegrass**	20
Kentucky bluegrass cuftivar***	65
Kentucky bluegrass cuitivar***	65
Kentucky bluegrass cultivar***	65

*A commercial mixture may be used if it contains a high percentage of similar bluegnasses; it may or may not contain creeping red fescue.
**Choose two'different cultivars of turf-lype perennial ryegrass, at 20 Ibs/acre each.
***Choose three different cultivars of Kentucky bluegrass. at 65 Ibsfacre each.

2.03 ACCESSORIES

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. Mulching Material: Thermally refined wood fiber, nontoxic, free of growth or germination inhibiting ingredients, dust form.

C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

D. Temporary Erosion Control Elements: Straw, wood fiber or other organic option for seed retention.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 SEEDING

A. Apply seed at a rate of 8 lbs per 1000 sq ft evenly in two intersecting directions. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Do not sow immediately following rain, when ground is too dry, or during windy periods.

D. Immediately following seeding and compacting, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

E. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

F. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

END OF SECTION

CITY OF WATERLOO

NEW CITY HALL / POLICE HEADQUARTERS

100 E 4TH ST,
WATERLOO, IA

INVISION:24102
CITY OF WATERLOO

BID DOCUMENTS
8/26/2026



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NEW CITY HALL / POLICE HEADQUARTERS

INVISION:24102
CITY OF WATERLOO

ISSUE DATE:8/26/2026
BID DOCUMENTS
MANAGING ARCHITECT: JIM TRUNNELL
JIM.TRUNNELL@INVISIONARCH.COM

SHEET NAME:
COVER SHEET

SHEET:
G0.00

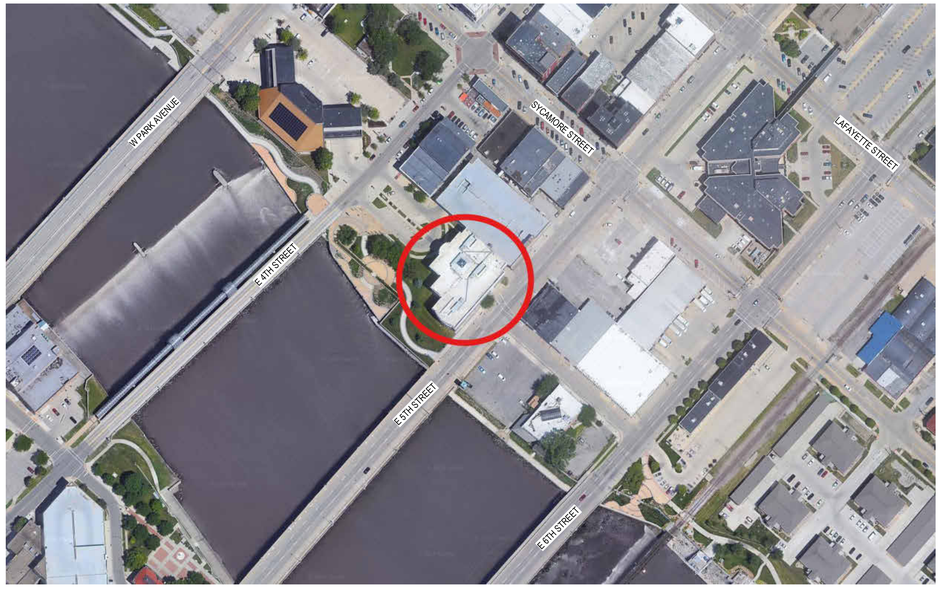
CITY OF WATERLOO

NEW CITY HALL / POLICE HEADQUARTERS

100 E 4TH ST,
WATERLOO, IA

BID DOCUMENTS

8/26/2026



GENERAL CODE INFO:

APPLICABLE CODES - CITY OF WATERLOO

2021 - INTERNATIONAL BUILDING CODE
2021 - INTERNATIONAL EXISTING BUILDING CODE
2024 - INTERNATIONAL MECHANICAL CODE
2024 - UNIFORM PLUMBING CODE
2012 - INTERNATIONAL ENERGY CONSERVATION CODE
2023 - NATIONAL ELECTRICAL CODE
2021 - INTERNATIONAL FIRE CODE

BUILDING HEIGHTS AND AREAS (CHAPTER 5)

BUILDING FLOOR AREA:	51,000 SF
NEW BUILDING FLOOR AREA:	880 SF
BUILDING STORIES HEIGHT:	75' ALLOWED - EXISTING 61'-8" - NEW 14'-0"
BUILDING TYPE:	TYPE 2B
SPRINKLERS:	YES
PARKING:	N/A - ADJACENT PARKING GARAGE

OCCUPANCY TYPE (CHAPTER 3)

1. OCCUPANCY - BUSINESS

MATERIALS LEGEND:

- FINISH CONTOURS
- EXISTING CONTOURS
- EARTH
- GRAVEL
- BRICK
- CONCRETE
- PARTICLE BOARD
- PRECAST CONCRETE
- RIGID INSULATION
- SPRAY INSULATION
- FIBER CEMENT PANEL
- GYPSUM BOARD
- PLYWOOD
- MASONRY
- STEEL
- NOMINAL LUMBER
- NON-NOMINAL LUMBER/SHIM
- ALUMINUM
- FINISH LUMBER
- BATT INSULATION
- MINERAL WOOL

GENERAL NOTES:

1. ALL WORK SHALL COMPLY WITH APPLICABLE CODES AND ORDINANCES IN FORCE AT TIME OF CONSTRUCTION.
2. VERIFY ALL DIMENSIONS, EXISTING AND NEW CONDITIONS ON THE JOB BEFORE PROCEEDING WITH THE WORK. DISCREPANCIES, IF ANY, ARE TO BE REFERRED TO THE ARCHITECT PRIOR TO START OF WORK.
3. UNLESS NOTED OTHERWISE, THE PLAN DIMENSIONS SHOWN ARE:
   A. TYPICALLY TO THE CENTERLINE OF STUD AT INTERIOR PARTITIONS
   B. TO THE FACE OF WALLS IN HALLWAYS SHOWING CLEAR WIDTHS
   C. TO THE FACE OF FURRED OUT WALLS
   D. TO THE FACE OF MASONRY OR FACE OF CONCRETE WHERE INDICATED (NOMINAL)
   E. IF DIMENSION POINT IS IN QUESTION, CONTACT ARCHITECT
4. DOORS NOT LOCATED BY DIMENSION ON PLANS OR DETAILS SHALL BE INSTALLED SUCH THAT THE DOOR, WHEN IN THE FULL OPEN POSITION AGAINST WALL STOP, IS PARALLEL TO ADJACENT WALL. COORDINATE WITH DOOR HARDWARE.
5. CONTRACTORS SHALL CONSULT PLANS OF ALL TRADES FOR OPENINGS AND ROUGH-INS, ROUGH-OUTS THROUGH SLABS, WALLS, CEILINGS, AND ROOFS FOR DUCTS, PIPES, CONDUITS, CABINETS AND EQUIPMENT, AND SHALL VERIFY SIZE AND LOCATION BEFORE PROCEEDING WITH WORK.
6. PROVIDE FIRE RESISTIVE CLOSURE, MEETING THE REQUIREMENTS OF THE GOVERNING FIRE AUTHORITIES, AT ALL GAPS AROUND THE PENETRATING DUCT, PIPES, CONDUITS, OR LIKE ITEMS AT ALL FIRE RATED BUILDING COMPONENTS.
7. THE CONTRACTOR SHALL VERIFY ALL ROUGH-IN DIMENSIONS AND EQUIPMENT, FURNISHED AND INSTALLED BY HIMSELF/HERSELF OR OTHERS, PRIOR TO PROCEEDING WITH WORK.
8. ALL PIPING, CONDUITS, DUCTS, ETC. SHALL BE FURRED-IN WITHIN ALL ROOMS EXCEPT ELECTRICAL CLOSETS, TELEPHONE CLOSETS, MECHANICAL ROOMS, AND ROOMS DESIGNATED TO HAVE EXPOSED ROOF STRUCTURE.
9. CONTRACTOR SHALL COORDINATE WITH ALL OWNER FURNISHED ITEMS AND PROVIDE ALL REQUIRED MECHANICAL AND ELECTRICAL CONNECTIONS, INCLUDING STUB OUTS FOR NEW OR FUTURE WORK INDICATED.

ALTERNATES:

ALTERNATE 1: STORM SHELTER ADDITION
BASE BID: NO STORM SHELTER OR ASSOCIATED WORK.
ADD ALTERNATE BID: CONSTRUCT NEW STORM SHELTER ADDITION AND ALL ASSOCIATED WORK.

ALTERNATE 2: BULLET RESISTANT PUBLIC CORRIDOR WALLS AND DOORS
BASE BID: IDENTIFIED PUBLIC CORRIDOR WALLS, DOORS AND FRAMES CONSTRUCTED USING TYPICAL STUD WALL ASSEMBLY AND TYPICAL DOORS AND FRAMES.
ADD ALTERNATE BID: IDENTIFIED PUBLIC CORRIDOR WALLS, DOORS AND FRAMES CONSTRUCTED TO BE BULLET RESISTENT.

ALTERNATE 3: BULLET RESISTANT EXTERIOR WINDOWS AND DOORS
BASE BID: IDENTIFIED EXISTING WINDOWS TO REMAIN.
ADD ALTERNATE BID: IDENTIFIED WINDOWS AND DOORS TO BE REPLACED WITH BULLET RESISTANT WINDOW UNITS, INCLUDING FRAMES AND GLAZING.

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G0.03 CODE REVIEW AND LIFE SAFETY - PLANS
G0.04 ACCESSIBILITY DETAILS & TYPICAL MOUNTING HEIGHTS

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E1.08 FIRST FLOOR ELECTRICAL PLAN - WALKER DUCT
E1.09 SECOND FLOOR ELECTRICAL PLAN - WALKER DUCT
E2.01 FIRST FLOOR LIGHTING PLAN
E2.02 SECOND FLOOR LIGHTING PLAN
E2.03 THIRD FLOOR LIGHTING PLAN
E4.01 ELECTRICAL ENLARGED PLANS
E4.02 ELECTRICAL ALTERNATE 1 PLANS
E5.01 ELECTRICAL DETAILS
E5.02 ELECTRICAL DETAILS
E5.04 ONE LINE DIAGRAM DETAILS
E5.05 ONE LINE DIAGRAM - DEMOLITION
E5.06 ONE LINE DIAGRAM - NEW
E5.08 ELECTRICAL SCHEDULES
E6.01 ELECTRICAL SCHEDULES
E6.02 ELECTRICAL SCHEDULES
E6.03 ELECTRICAL SCHEDULES
E6.04 ELECTRICAL SCHEDULES
E6.05 ELECTRICAL SCHEDULES
E6.06 ELECTRICAL SCHEDULES
E6.07 ELECTRICAL SCHEDULES
E6.08 ELECTRICAL SCHEDULES
E6.09 ELECTRICAL SCHEDULES
E6.10 ELECTRICAL SCHEDULES
E6.12 ELECTRICAL SCHEDULES

8. TELECOMMUNICATIONS
T1.01 FIRST FLOOR LOW VOLTAGE FLOOR PLAN
T1.02 SECOND FLOOR LOW VOLTAGE FLOOR PLAN
T1.03 THIRD FLOOR LOW VOLTAGE FLOOR PLAN
T2.01 FIRST FLOOR LOW VOLTAGE CEILING PLAN
T2.02 SECOND FLOOR LOW VOLTAGE CEILING PLAN
T2.03 THIRD FLOOR LOW VOLTAGE CEILING PLAN
T3.01 ENLARGED PLANS LOW VOLTAGE
T3.02 ENLARGED PLANS LOW VOLTAGE
T4.01 IT CLOSET MAPPING
T4.02 LOW VOLTAGE ADD ALTERNATE PLAN VIEWS
T5.01 LOW VOLTAGE DETAILS
T5.02 LOW VOLTAGE DETAILS
T5.03 LOW VOLTAGE DETAILS
T5.04 LOW VOLTAGE DETAILS
T5.05 LOW VOLTAGE ALTERNATE DETAILS

ARCHITECTURAL SYMBOLS:

NORTH ARROW
NORTH DIRECTION
NORTH

DETAIL REFERENCE
DETAIL NUMBER
SIM
SHEET NUMBER

STANDARD DIMENSION STYLE
DIMENSION W/ DOT INDICATE CENTERLINE OF OBJECT
STANDARD DIMENSIONS

INTERIOR WALL IDENTIFICATION
WALL TYPE
ADDITIONAL COMMENTS / MODIFIER
INSULATION IDENTIFIER
FIRE RATING

EXTERIOR WALL IDENTIFICATION
WALL TYPE

DRAWING REFERENCE
View Name
1/8" = 1'-0"

DOOR IDENTIFICATION
NEW
EXISTING
DOOR NUMBERS

WINDOW IDENTIFICATION
NUMBER DESIGNATES WINDOW TYPE

EXTERIOR & INTERIOR ELEVATION
DENOTES ELEVATION SHOWN
ELEVATION NUMBER
SHEET NUMBER

SPOT ELEVATION

SECTION TAG
SECTION NUMBER
SIM
SHEET NUMBER

ROOM IDENTIFICATION
Room Name
101
ROOM NAME
ROOM NUMBER

STRUCTURAL GRID
NUMBER DESIGNATES (VERTICAL) LETTER DESIGNATES (HORIZONTAL) GRID BUBBLES

KEYNOTE
NUMBER DESIGNATES KEY NOTE

FINISH TAG
Room name
RM ###
Wall Finish
Base Finish
Floor Finish
Remarks

CASEWORK TAG
CUSTOM
PLAM1
24 • 24 • 34.5
CUSTOM SIZE
MATERIAL
LOCK INDICATOR
LIGHT VALANCE
SIZE: W•D•H

COUNTERTOP TAG
PLAM1
4 • 25 • 1.50
MATERIAL
COUNTERTOP THICKNESS
COUNTERTOP SIZE: D
BACKSPLASH SIZE: H

ACT	ACOUSTICAL CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AMC	ACOUSTICAL METAL CEILING
ANOD	ANODIZED
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
AP	ACRYLIC PANEL
APROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASTM	ASTM INTERNATIONAL
AW	ACOUSTICAL WALLCOVERING
BB	BURNISHED BLOCK
BD	BOARD
BGC	BY GENERAL CONTRACTOR
BLDG	BUILDING
BLKG	BLOCKING
BO	BY OTHER (THAN CONTRACTOR)
BR	BUMPER RAIL
BRG	BEARING
CAB	CABINET
CB	CARPET BASE
CC	CUBICAL CURTAIN
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CG	CORNER GUARD
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CK	CORK
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET
CS	CONCRETE SEALED
CSWK	CASEWORK
CTOP	COUNTERTOP
CTR	CENTER, CENTERED
CW	CURTAIN WALL
DBL	DOUBLE
DEMO	DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DN	DOWN
DP	DEPTH
DTL	DETAIL
DW	DISHWASHER
DWG	DRAWING
EA	EACH
EC	ENTRY CARPET
EF	EPOXY FLOOR
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELECT	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
EQ	EQUAL
EQUIP	EQUIPMENT
EX	EXISTING
EXP	EXPANSION, EXPOSED
EXT	EXTERIOR
FCB	FIBER CEMENT BOARD
FD	FLOOR DRAIN
FE	FINISHED END PANEL
FEC	FIRE EXTINGUISHER CABINET
FEW	FIRE EXTINGUISHER WALL
FHC	FIRE HOSE CABINET
FIN	FINISH
FIXT	FIXTURE
FLEX	FLEXIBLE
FLR	FLOOR
FOF	FACE OF FINISH
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT OR FEET
FTP	FIRE TREATED PLYWOOD
FV	FIELD VERIFY
G	GROUND
GA	GAGE, GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GF	GRAPHIC FILM
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GL	GLASS
GP	GLASS PANEL
GR	GROUT
GYP	GYPSUM
GYP BD	GYPSUM BOARD
HD	HAND DRYER
HDG	HOT DIPPED GALVANIZED
HDW	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HPC	HIGH PERFORMANC COATING/ED
HR	HANDRAIL
HT	HEIGHT
HVAC	HEATING, VENTILATION, & AIR CONDITIONING
IB	INTEGRAL BASE
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IN	INCH
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
JT	JOINT
KS	KNEE SPACE
L	LOCK
LAV	LAVATORY
LKR	LOCKER
LVR	LOUVER
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MKBD	MARKERBOARD
MLWK	MILLWORK
MM	MILLIMETER
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
N	NEW
NA	NOT APPLICABLE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OFVI	OWNER FURNISHED, VENDER INSTALLED
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
ORD	OVERFLOW ROOF DRAIN
OTS	OPEN TO STRUCTURE
PC	POLISHED CONCRETE
PLAM	PLASTIC LAMINATE
PLYWD	PLYWOOD
PR	PAIR
PREFIN	PREFINISHED
PT	PAINT
PTD	PAPER TOWEL DISPENSER
RAD	RADIUS
RAF	RESILIENT ATHLETIC FLOORING
RB	RESILIENT BASE
RC	RESILIENT CHANNEL
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFRIGERATOR
REINF	REINFORCE
REQD	REQUIRED
RF	RESILIENT FLOORING
RO	ROUGH OPENING
RTU	ROOF TOP UNIT
RV	ROOF VENT
SC	SCRIBE
SCHED	SCHEDULE
SIM	SIMILAR
SLNT	SEALANT
SN	STAIR NOSING
SPEC	SPECIFICATION
SPECD	SPECIFIED
SQ	SQUARE
SR	STAIR RISER
SSM	SOLID SURFACE MATERIAL
SST	STAINLESS STEEL
ST	STAIR TREAD
STN	STAIN
STRUCT	STRUCTURAL
SURF	SURFACE
SUSP	SUSPEND
SYMM	SYMMETRICAL
T	TEMPERED
T&G	TONGUE AND GROOVE
TB	TILE BASE
TC	TROWELED CONCRETE
THRU	THROUGH
TK	TACKABLE SURFACE
TKBD	TACKBOARD
TL	TILE
TM	T MOLDING
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF STEEL
TP	TOILET PARTITION
TPD	TOILET PAPER DISPENSER
TSTAT	THERMOSTAT
TV	TELEVISION
TYP	TYPICAL
TZ	TERRAZZO
UL	UNDERWRITERS LABORATORIES
UNF	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
V	LIGHT VALANCE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VTR	VENT THOUGH ROOF
VWP	VINYL WALL PAD
W/	WITH
W/O	WITHOUT
WB	WOOD BASE
WBL	WOOD BLOCKING
WC	WALL COVERING
WD	WOOD
WDSF	WOOD SPORTS FLOORING
WF	WOOD FLOORING
WOC	WALK-OFF CARPET
WP	WALL PROTECTION
WR	WATER RESISTANT
WSCT	WAINSCOT
WT	WINDOW TREATMENT
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH

LICENSED PROFESSIONAL ARCHITECT
JAMES TRUNNELL
06286
IOWA

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed architect under the laws of the State of Iowa.

JAMES TRUNNELL — 08.12.2026
Printed or typed name — Date

Signature
JUNE 30, 2027
Registration expires

GENERAL AND ARCHITECTURAL SERIES
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STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
TITLE SHEET

SHEET:
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CODE REVIEW

PROJECT	New City Hall / Police Headquarters	**PROJECT #**	24102
OWNER	City of Waterloo	**DATE**	8/12/2026
LOCATION	Waterloo, IA		
ARCHITECT	Jim Trunnell, AIA		

GOVERNING BUILDING CODES (INCLUDED IN DETAILED REVIEW):

- Waterloo City Code of Ordinances (WCC)
- Iowa Code (IC) & Iowa Administrative Code (IAC)
- 2021 International Building Code (IBC) w/ minor amendments. [WCC 9-1-1 & 2]
- 2012 International Energy Conservation Code (IECC). [(State Code) IAC 661-303.3]
- 2020 ICC 500, Design and Construction of Storm Shelters (DCSS) [IBC 423.5]

OTHER APPLICABLE REGULATIONS:

- Accessibility:
  - 2009 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.
  - 2010 Americans with Disabilities Act Standards for Accessible Design (ADA)
- 2021 International Existing Building Code (IEBC) [WCC 9-1-1 & 2]
- 2021 International Fire Code (IFC) w/ appx. B, C, D, & H. w/ amds. [WCC 9-2-2]
- 2024 International Mechanical Code (IMC) w/ amds. [WCC 9-5A-1 & 2 / IAC 641-61.2]
- 2023 National Electrical Code NFPA 70 (NEC) w/ amds. [WCC 9-3-5 & 6 / IAC 661-504.1]
- 2024 Uniform Plumbing Code (UPC) w/ amds. [WCC 9-4A-1 & 2 & IAC 641-25.1]
  - 2021 IBC/IPC allowed for Fixture Counts. [City AHJ (email 2/16/2024)]

PROJECT DESCRIPTION:

Work to include selective interior demolition of existing structure, new walls, flooring, ceilings, finishes, doors and frames, exterior glazing replacement, mechanical, electrical, plumbing, and technology. Alternate shown for storm shelter.

OCCUPANCY:

Classifications

Typical Building Areas – Group B (Business) [IBC 304.1]

Assembly Occupancies

- Small Assembly Occupancies (Accessory to Group B)
  (rooms or spaces < 750sf or an occ load < 50) [IBC 303.1.2]
- Assembly Group A-3 – Uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A (Courtrooms, Lecture halls, & Waiting areas). [IBC 303.4 & Commentary].

Mixed Occupancy Allowances / Requirements (for reference):

- Accessory Occupancies / Incidental Occupancies:
  - Based on the main occupancy, the total of all accessory occupancies on a floor are limited to 10% of the area and the allowable area for the accessory occupancy without increases. [IBC 508.2.2 & 508.2.3]
  - Rated Separations – not required unless by other sections. [IBC 508.2.4]
- Non-separated Occupancies:
  - Allowable Building Area & Height – based on the most restrictive occupancy. [IBC 508.3.2]
  - Rated Separations – not required unless by other sections. [IBC 508.3.3]
  - Code Requirements – based on each occupancy for that portion of the building. Fire protection systems requirements are based on the most restrictive requirements of any of the non-separated occupancies. [IBC 508.3.1]

- Required Separations of Incidental-Use:

Required Separations of Incidental-Use		
Specific Use Area:	**IBC 2021 [Table 509.1]**	**Comments:**
General Storage Rooms	Determined by mixed occupancy	General storage rooms rated by not required by code
Hazardous Storage (Science Areas)	1-HR Fire Barriers 2-HR Floor	Control Areas [IBC Table 414.2.2 & 414.2.4]
Sprinkler system – where an automatic sprinkler system is allowed in lieu of rated wall, walls shall resist the passage of smoke and have automatic closing doors. [IBC 509.4.2]		

Building Risk Category – Category IV (Fire, rescue, ambulance and police stations and emergency vehicle garages) [IBC Table 1604.5]

- Existing building to be retrofitted to meet structural requirements of 1604.5

GENERAL BUILDING LIMITATIONS:

Building Construction:

- **Construction Type** [IBC Tables 504.3, 504.4, 506.2, & 601]
  - **Typical** (new / existing) **– Type IIB** (2-HR noncombustible)
- **Construction Materials:**
  - Addition Construction Materials:
    - Floors – concrete.
    - Roofs – precast concrete.
    - Walls – CMU Block.
  - Existing Construction Materials:
    - Structural Frame – steel frame / concrete masonry bearing walls. (Existing steel structure is fireproofed, but not required due to updated floor plan/atrium design)
    - Floors – steel & concrete.
    - Roofs – steel framed.
    - Walls – steel framed / concrete masonry.

Building Area:

- Planned Building Area

	Total	New	Existing
First Floor			
Group A-3		**778 SF**	**1,298 SF**
Group B			**14,498 SF**
Second Floor			
Group A-3			**1,617 SF**
Group B			**12,675 SF**
Group S-1			**1,194 SF**
Third Floor			
Group A-3			**2,722 SF**
Group B			**12,508 SF**
Group S-1			**207 SF**
Total	**48,155 SF**	**778 SF**	**47,377 SF**

- Allowable Building Area:
  - Allowable Area per Story (Type IIB / sprinkler multi-story) – **Unlimited**

	General [IBC Table 506.2]	Frontage Increase	w/ Frontage Increase
Group A-3	28,500	(NA)	(NA)
Group B	69,000	(NA)	(NA)

Building Height (stories & height above average grade plane):

- Existing Building Height – 3 stories / 62 ft

	Stories
Existing	3 story / 62 ft (top of atrium skylight)
Storm Shelter	1 story / 14 ft

- Allowable Building Height (Type IIB) – 4 stories / 75 ft

	(Type IIB / sprinkler) [IBC Tables 504.3 & 504.4]
Group A-3	3 stories / 75 ft
Group B	4 stories / 75 ft

Building Construction:

Building Element Fire Resistance Ratings	
Building Element:	**IBC 2021 (Type IIB)**
Structural Frame	0-HR [Table 601] Supporting Roof Only: 0-HR (supporting roof only) [Table 601(a)] 0-HR if ≥ 20 ft above any floor below (supporting roof only) [Table 601(b)]
Bearing Walls – Exterior	0-HR [Table 601 & 705.5]
Bearing Walls – Interior	0-HR [Table 601] 0-HR (supporting roof only) [Table 601(a)]
Non-Bearing Walls – Exterior	0-HR – Fire Separation Distance ≥ 30' (Group A / B / S-1) [Table 705.5] Penthouse Walls – 0-HR (Fire Separation ≥ 20 ft). [IBC 1511.2.4 Expt 1] (see additional notes on penthouse below)
Non-Bearing Walls – Interior	0-HR [Table 601]
Floors & secondary members	0-HR [Table 601]
Roofs & secondary members	0-HR [Table 601] -or- 0-HR if ≥ 20 ft above any floor below [Table 601(b)]

- Vertical Openings – require shaft enclosures unless allowed by one of the following: [IBC 712]
  - Duct & Air Transfer Openings: [IBC 712.1.6]
    - Connecting no more than 2 Stories – fire damper allowed at floor line (not Group I-2 / I-3) [IBC 717.6.1]
    - Air Transfer Openings – allowed per 2-Story VertiCal Openings below. [IBC 717.6.1]
  - Vertical Openings at Exit Access Stairs & Ramps – see Unenclosed Stairs below. [IBC 712.1.12]
  - Skylights & Roof Penetrations – allowed in fire rated roofs as long as the fire resistance of the roof structure is maintained. [IBC 712.1.15]

- Shaft Enclosures
  - Continuity (per Fire Barriers) – to extend from top of floor below to underside of floor or roof sheathing above & continuous through concealed spaces. [IBC 707.5]
  - Supporting Construction – requires same rating as shaft enclosure (FB). [IBC 713.5 & 707.5.1]
  - Enclosure at Bottom – shafts are allowed be enclosed at the bottom with construction of the same fire-resistance as the shaft or lowest floor penetrated (whichever is greater) and/or fire dampers. [IBC 713.11, 1 & 3]

- Elevators:
  - Elevator Lobbies – not required (elevator shaft connects ≤ 3 stories). [IBC 3006.2]
  - Ambulance Stretcher Car – not required (< 4 stories). [IBC 3002.4]
  - Fire-fighter emergency elevator operation – required. [IBC 3003.2]
  - Machine Rooms – require same rating as elevator hoistway, or, if they do not abut & have no openings to the hoistway they serve, they require no rating (≤ 4 stories). [IBC 3005.4]
  - Fire Service Access Elevator – not required (occupied level ≤ 120 ft above lowest level of fire dept. vehicle access). [IBC 3007 & 403.6.1]

- Roof & Roof Structures:
  - Roof Required Min. Fire Classification - Class B (Type IB Construction) [IBC 1505.1 / Table]
  - Reroofing Allowances
    - Roof Slope – 1/4" per foot slope not required (existing low sloped roofs). [IBC 1512.1 Expt 1]
    - Secondary (emergency overflow) drains / scuppers – not required to meet requirements for new roofs. Existing secondary drainage or scuppers cannot be removed. [IBC 15.12.1 Expt 2]
  - Mechanical Equipment Screens [IBC 1511.6]
    - Construction – noncombustible (to meet the requirements for exterior walls).
      Height – 18 ft (from the roof deck to the highest point of the screen) [IBC 1511.6.1]

FIRE PROTECTION SYSTEMS:

Automatic Sprinkler System:

- **Providing – NFPA 13 System** (existing & new).
- Requirements – **Required**
  - Group B (Office Spaces) – Not Required (not ambulatory care) [IBC 903.2.2]
  - Group S-1 – Required (fire area ≥ 12,000 sf) [IBC 903.2.9]
- **Exterior Roofs, Canopies, or Porte-Cochere** – Sprinklers Not Required at exterior canopies & roofs constructed of noncombustible, limited-combustible, or fire-retardant treated wood.
  [NFPA 13: 9.2.3.2]

Standpipe System:

- Required
  - [IBC 905.3]

Portable Fire Extinguishers – Required (Group E / A / B / S) [IBC 906.1(1)]

- Specific Location Requirements:
  - Flammable / Combustible Liquids – Required (where stored / used / dispensed).[IBC 906.1(3)]
  - Special-hazard areas (labs, computer rooms, generator rooms where req'd. by AHJ)
    [IBC 906.1(6)]
- Extinguisher Occupancy Hazard – Ordinary (Moderate) Hazard (typ.). [2018 NFPA 10: 5.4.1]
- Areas of Class A (ordinary combustibles, typ.) [IBC Table 906.3(1) & NFPA 10: Table 6.2.1.1]
  - Maximum Travel Distance – 75 feet
  - Maximum floor area per extinguisher – 11,250 sf
  - Minimum extinguisher rating – 2-A
  - Maximum floor area per unit of A rating – 1,500 sf
- Areas of Class B (areas w/ flammable liquids ≤ 1/4 in.) [IBC Table 906.3(2) & NFPA 10: Table 6.3.1.1]
  - Maximum Travel Distance:
    - 30 feet (min. extinguisher rating 10-B)
    - 50 feet (min. extinguisher rating 20-B)
- Areas of Class C (areas where energized electrical equipment may be sprayed) – require Class C extinguishers. See other Classes for size and placement.
  [IBC 906.3.3 & NFPA 10: 6.4]

Fire Alarm & Detection Systems:

- Fire Alarm System:
  - Providing – voice / alarm system (existing & new)
  - Requirements – Manual system not required
    - Group B (Office Spaces) – Required (Group B Occ. > 500) [IBC 907.2.2]
      - Manual Fire Alarm Boxes – are not required in Group B buildings sprinklered throughout, with alarm activation by sprinkler flow. [IBC 907.2.2 Expt]
- Smoke Detection: Required as noted below
  - Group B: [IAC 301.3(15) amd. to IBC 907.2.3]
    - Corridors – smoke detection required (every 30 ft).
    - Hazardous / Nonoccupied Areas – heat or smoke detection required.
  - Typically – Not Required (Group A / B / S) [IBC 907.2.1, 907.2.2, 907.2.10, & 907.2.11]

MEANS OF EGRESS [IBC CHAPTER 10]:

Occupant Load: (see calculation table with code plan for breakdown of areas)

Number of exits:

- Minimum Number of exits requirements:
  - 1 exit access allowed: (sprinklered) [IBC 1006.2.1 & Table 1006.2.1]
    - Group B: ≤ 49 Occ. / ≤ 100 ft common path of travel.
    - Group A: ≤ 49 Occ. / ≤ 75 ft common path of travel.
    - Unoccupied Mechanical Rooms and Penthouses: no common path limit.
      [IBC 1006.2.1 Expt 3]

- Travel Distance (to nearest exit) [IBC Table 1017.2]
  - Office Spaces – **300 ft** (Group B, sprinkler)

Minimum Calculated Widths:

Minimum Calculated Egress Widths		
	Required	Provided
Stairs		
3rd Floor	**52.8 in.** (264 Occ. x 0.20) (largest calculated width)	**65 in. clear (36 in. leaf x 2)** (min. door width)
2nd Floor	**39.4 in.** (264 Occ. x 0.20) (largest calculated width)	**65 in. clear (36 in. leaf x 2)** (min. door width)
1st Floor	**22.35 in.** (264 Occ. x 0.15) (largest calculated width)	**195 in. clear (36 in. leaf x 5)** (min. door width)

- Egress Widths Required per occupant: [IBC 1005.3.1 Expt 1 & 1005.3.2 Expt 1]
  - Stairways – 0.20" / Occ. (sprinkler & emergency voice / alarm)
  - Components other than stairs – 0.15" / Occ. (sprinkler & emergency voice / alarm)
- Exiting from Multiple Levels – Exits serving multiple floors need only be sized for the occupant load from each floor individually. [IBC 1005.3.1]
- Egress Capacity Distribution – loss of any single exit cannot reduce egress capacity to less than 50% of the required. [IBC 1005.5]
- Egress Convergence – where egress from a story above & below converges at an intermediate level, the egress from the point of convergence is to be sized for the total load from both stories together. [IBC 1005.6]

Separation of Exits / Exit Access

- **1/3 the diagonal** (at least 2 exits) (sprinklered) [IBC 1007.1.1 Expt 2]
- Additional means of egress required above 2 – arranged a reasonable distance apart so if 1 egress becomes blocked, the others are still available. [IBC 1007.1.2]

Accessible Means of Egress:

- Minimum Number of Accessible Means of Egress: [IBC 1009.1]
  - 1 exit access allowed – accessible spaces requiring 1 exit.
  - 2 exit accesses allowed – accessible spaces requiring more than 1 exit.
- Travel Distance & Separation – no requirements, but still need to be separate & distinct with consideration for entrapment. [IBC 1009.1 & Commentary]
- Accessible Exit Discharge – required to a public way. [IBC 1009.2]
- Egress Elevator – not required (accessible level < 4 stories above level of discharge). [IBC 1009.2.1]
- Accessible Egress Stairs – (see stairs below) [IBC 1009.3]
- Exterior Areas for Assisted Rescue – not required (accessible exterior routes from exits). [IBC 1009.7]
- Two-way Communication System – required at elevator landings on each accessible floor above or below the level of exit discharge. [IBC 1009.8]

Doors:

- Minimum width – **35.5 in. (32 in. clear)** [IBC 1010.1.1]
  - Pair of Doors – one door needs to be **35.5 in. (32 in. clear)** [IBC 1010.1.1]
- Encroachment into Required Egress Width: [IBC 1005.7.1]
  - Anywhere in swing – doors cannot reduce the required width by more than 1/2.
  - Fully open – doors cannot reduce the required width by more than 7 in.
- Door Swing – direction of travel when occ. load ≥ 50. [IBC 1010.1.2.1]
  - Electrical Rooms – direction of travel (≥ 800 amps) [NEC 110.26(C)(3)]
  - Sliding Doors – allowed when occ. load ≤ 10 (not Group H). [IBC 1010.1.2 Expt. 9]
- Panic Devices – Required in Group A & E occupancy with Occ. Load ≥ 50. [IBC 1010.2.9]
  - Electrical Rooms – Not Required (< 800 amps). [IBC 1010.2.9.2]

Stairs:

- Minimum Stairway Width:
  - Occupant Load ≥ 50 – 44 in. [IBC 1011.2]
  - Projections into required width – ≤ 4.5 in. (at or below handrail height) [IBC 1014.8]
- Vertical Rise Limit – 12 ft (between landings). [IBC 1011.8]
- Accessible Egress Stairs – do not require 48 in. width or area of refuge (sprinkler).
  [IBC 1009.3.2 Expt 1 & 1009.3.3 Expt 2]
- Unenclosed Stairways – allowed in the following situations:
  - Exit Access Stairs with a Limited Floor Opening Size, Connecting ≤ 4 stories
    (NFPA 13 sprinkler throughout) [IBC 1019.3 Expt 4]
- Handrails
  - Handrails Both Sides – stairs to have handrails on each side. [IBC 1011.11]
  - Handrail Extensions:
    - Typically – required at the top & bottom of stair runs where the handrail does not continue to an adjacent flight of stairs. [IBC 1014.6]
- Roof Access Stair
  - Requirement – Not Required (< 4 stories) [IBC 1011.12]

Corridors & Hallways:

- Minimum Width [IBC 1020.3 & Table 1020.3]
  - Group A / B Areas with Occ. Load ≥ 50 **– 44 in.**
  - Areas with Occ. Load < 50 **– 36 in.**

PLUMBING FIXTURES (2021 UPC)

Plumbing Fixture Counts Breakout

- NUMBER OF FIXTURES:
  - VARIANCE: THE CALCULATIONS IN THE TABLE BELOW SHOW THE NUMBER OF FIXTURES WE ARE CURRENTLY PROVIDING AS WELL AS CALCULATED FIXTURE NUMBERS BASED ON THE 2021 UNIFORM PLUMBING CODE & IPC 2021:
    - URINALS: FOR EACH URINAL IN EXCESS OF THE MINIMUM REQUIRED, ONE WATER CLOSET MAY BE DEDUCTED. THE NUMBER OF WATER CLOSETS CANNOT BE REDUCED BELOW 2/3 THE MINIMUM REQUIRED. [UPC TABLE 422-1 NOTE 4]
    - DRINKING FOUNTAINS:
      - WATER STATIONS: WHERE FOOD IS CONSUMED INDOORS, WATER STATIONS MAY BE SUBSTITUTED FOR DRINKING FOUNTAINS. [UPC 415.2]
  - BASED OFF OF IBC'S OCCUPANT LOAD.
    - TOTAL BUILDING OCCUPANT LOAD – 2779/2 PER UPC 412.3 = 1390
      - MALE
        - WATER CLOSETS
        - 101-200 = 3
        - 610/2 = 305. 305/2 = 153 OCCUPANTS
        - TOTAL REQUIRED = 3, TOTAL PROVIDED = 9 PROVIDED (COUNTING HALF OF ALL UNISEX RESTROOMS)
        - URINALS
        - 101 - 200 = 2
        - 610/2 = 305. 305/2 = 153 OCCUPANTS
        - TOTAL REQUIRED = 2, TOTAL PROVIDED = 6
        - LAVATORIES
        - 301-400 = 5
        - 610/2 = 305 OCCUPANTS
        - TOTAL REQUIRED = 5, TOTAL PROVIDED = 10 (COUNTING HALF OF ALL UNISEX RESTROOMS)
      - FEMALE 15
        - WATER CLOSETS
        - 201 - 400 = 11
        - 610/2 = 305 OCCUPANTS
        - TOTAL REQUIRED = 11, TOTAL PROVIDED= 15 (COUNTING HALF OF ALL UNISEX RESTROOMS)
        - LAVATORIES
        - 301-400 = 6
        - 610/2 = 305 OCCUPANTS
        - TOTAL REQUIRED = 6, TOTAL PROVIDED= 9 (COUNTING HALF OF ALL UNISEX RESTROOMS)
      - DRINKING FOUNTAINS
        - 1 PER 150
        - 610 OCCUPANTS
        - TOTAL REQUIRED = 5, TOTAL PROVIDED = 6 + 3 BOTTLE FILLER
      - SERVICE SINKS
        - TOTAL REQUIRED = 1, TOTAL PROVIDED= 3

STORM SHELTER (ICC 500)

- **Storm Shelter**
  - Requirements – Not required (Critical emergency operations). [IBC 423.4] (Note: The City of Waterloo has reviewed code requirements with legal counsel and has determined that a storm shelter as called for in IBC section 423.4 is not required.)
  - Risk Category of Buildings and Other Structures – Level IV "Fire, rescue, ambulance and police stations and emergency vehicles garages. [IBC Table 1604.5]
  - Required Shelter Capacity - determined by Code official to serve Police Department only.
  - Shelter Location – in the building served or within 1,000 ft of an exterior door. [IBC 423.5.2]
- Shelter Size
  - Typical Area Per Occupant – 5 sf (standing or seated, Tornado) [DCSS Table 502.3]
    – 10 sf (wheelchair, Tornado)
  - Wheelchair Spaces – 1 per 200 occupants. [DCSS 502.3]
  - Floor Area – can utilize reduction factors or clear floor area or a combination [DCSS 502.4]
    - Concentrated Furnishings / Fixed Seating – 50% reduction.
    - Unconcentrated Furnishings / w/o Fixed Seating – 35% reduction.
    - Open Plan Furnishings w/o Fixed Seating – 15% reduction.
  - Egress [egress to be designed for normal use] [DCSS 504.4]
  - Shelter Essential Features & Accessories (tornado shelters) [DCSS Chpt 7]
    - Critical Support Systems – required to remain functional for 2-HRs [DCSS 701.1]
    - Ventilation – providing mechanical ventilation (tornado shelters). [DCSS 702.1.2]
      - Exhaust & Intake Openings
        - Intake Opening Location – 10 ft min. from hazardous / noxious contaminants. [DCSS 702.1.3]
        - Exhaust or Intake opening protection – must meet impact requirements. [DCSS 702.1.4]
    - Water Closets & Lavatories [DCSS 702.3]
      - Quantities [DCSS Table 702.3]
        - Water Closets – 1 / 250 first 500 then 1 / 500 additional.
        - Lavatories – 1 / 1,000.
        - Urinals – WC Substitution allowed the same as normal fixtures. [DCSS 702.3.2.1 & IPC 424.2]
          - Group A – 67% (max substitution for water closets).
          - Other Groups – 50% (max substitution for water closets).
      - Fixture Types – temporary water closets and lavatories approved by the AHJ are allowed. [DCSS 702.3.1]
    - Emergency Lighting – required to remain operation for 2-HRs [DCSS 702.5.2 , 702.8]
    - First Aid Kit – required (> 50 Occ.). [DCSS 702.9]

ENERGY CONSERVATION (IECC 2012):

- Planned – Building is Heated & Cooled.
  - Addition – will be constructed to meet energy code requirements.
  - Existing Building – unaltered portions of the existing building are not required to be brought up to the current code requirements. [IECC C101.4.3]
  - Prescriptive Requirements – are included below for the addition & for locations where the existing building envelope is being altered.

- **Climate Zone: 6A** (Moist) (Black Hawk County, IA) [IECC Table C301.1]

Building Envelope Required Ratings (Prescriptive)		
Building Element	**Commercial Building (Zone 6A)**	**Provided**
Roof (Cont. Insulation)	R-30 [Table C402.2]	
Exterior Walls:		
- Mass Walls	R-13.3ci [Table C402.2]	
- Metal Framed	R-13 + 7.5ci [Table C402.2]	
- Below Grade	R-7.5ci [Table C402.2]	
Exterior Floors (Elevated):		
- Mass	R-12.5ci [Table C402.2]	
- Joist / Framing	R-30 [Table C402.1.2]	
Slab-on-Grade (Unheated)	R-10 for 24in. [Table C402.2]	
Slab-on-Grade (Heated)	R-15 for 36in. [Table C402.2]	
Opaque Doors:		
- Swinging	U-0.37 [Table C402.2]	
- Roll-Up / Sliding	R-4.75 [Table C402.1.2]	
Glazed Doors & Windows	Fixed Fenestration: U-0.36 Operable Fenestration: U-0.43 Entrance Doors: U-0.77 SHGC (PF<0.2): 0.40 SHGC (PF≥0.2): (other factors allowed) [Table C402.3 & C402.3.3.1]	
Skylights	U-0.50 SHGC: 0.40 [Table C402.3]	

- Roof Tapered Insulation (Prescriptive) – a weighted R-value is allowed where minimum insulation thickness is 1" less than that required for the minimum R-value. [IECC C402.2.1 Expt 1]

- Fenestration:
  - Area Limitations (Prescriptive) [IECC C402.3.1]
    - Existing
  - Minimum Skylight Area – Existing
  - Skylight Haze Factor – Existing

- Air Leakage:
  - Air Barrier – required (Climate Zone 6) [IECC 402.4.1]
  - Vestibules:
    - Vestibules Required on – exterior entrance doors opening into conditioned spaces ≥ 3,000sf. [IECC 402.4.7 & Expt. 4]

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
CODE REVIEW AND LIFE SAFETY - WRITTEN REVIEW

SHEET:
G0.02

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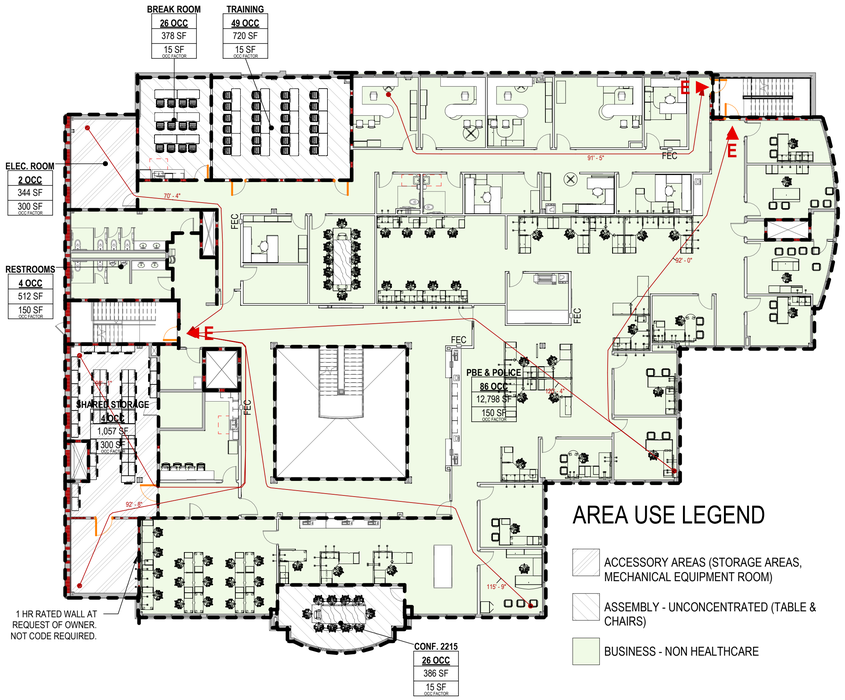


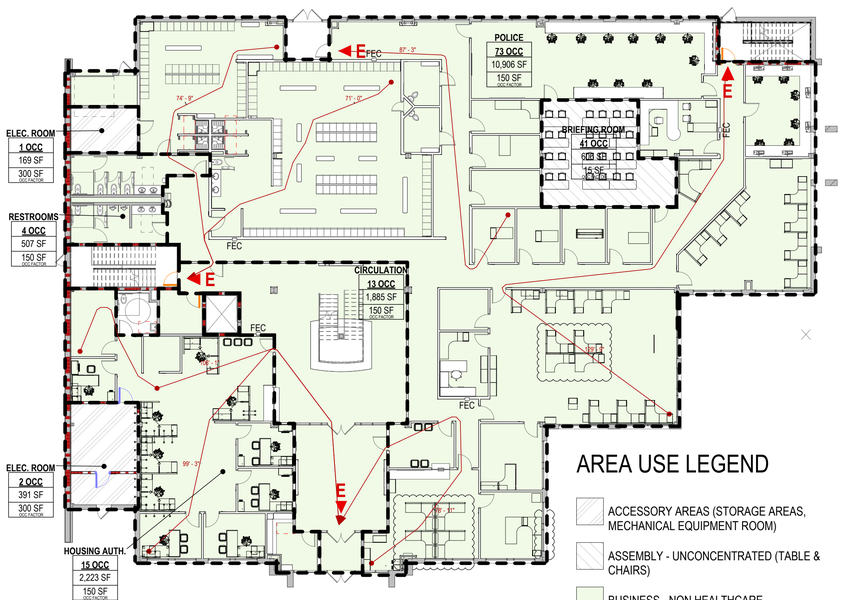
2 2ND FLOOR CODE REVIEW PLAN - AREA 24x36 SHEET

1/16" = 1'-0"



3 3RD FLOOR CODE REVIEW PLAN - AREA

1/16" = 1'-0"



1 1ST FLOOR CODE REVIEW PLAN - AREA 24x36 SHEET

1/16" = 1'-0"

CODE REVIEW - OCCUPANT LOAD FOR AREAS

#	NAME	AREA	FUNCTION OF SPACE	OCCUPANT LOAD FACTOR	OCCUPANT LOAD FACTOR TYPE	OCCUPANT LOAD
FIRST FLOOR						
2	ELEC. ROOM	391 SF	ACCESSORY AREAS (STORAGE AREAS, MECHANICAL, EQUIPMENT ROOM)	300 SF	GROSS	2
3	ELEC. ROOM	169 SF	ACCESSORY AREAS (STORAGE AREAS, MECHANICAL, EQUIPMENT ROOM)	300 SF	GROSS	1
6	BRIEFING ROOM	606 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	41
7	POLICE	10,906 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	73
25	HOUSING AUTH.	2,223 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	15
29	CIRCULATION	1,885 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	13
30	RESTROOMS	507 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	4
FIRST FLOOR		16,685 SF				149
SECOND FLOOR						
8	SHARED STORAGE	1,057 SF	ACCESSORY AREAS (STORAGE AREAS, MECHANICAL, EQUIPMENT ROOM)	300 SF	GROSS	4
9	ELEC. ROOM	344 SF	ACCESSORY AREAS (STORAGE AREAS, MECHANICAL, EQUIPMENT ROOM)	300 SF	GROSS	2
10	TRAINING	720 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	49
11	CONF. 2215	386 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	26
33	BREAK ROOM	378 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	26
12	PBE & POLICE	12,798 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	86
31	RESTROOMS	512 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	4
SECOND FLOOR		16,197 SF				197
THIRD FLOOR						
26	COUNCIL DIAS	58 SF	(none)	7 SF		9
13	SHARED STORAGE	207 SF	ACCESSORY AREAS (STORAGE AREAS, MECHANICAL, EQUIPMENT ROOM)	300 SF	GROSS	1
14	ELEC. ROOM	162 SF	ACCESSORY AREAS (STORAGE AREAS, MECHANICAL, EQUIPMENT ROOM)	300 SF	GROSS	1
15	SEATING	81 SF	ASSEMBLY - CONCENTRATED W/O FIXED SEATS (CHAIRS ONLY - NOT FIXED)	7 SF	NET	12
17	SEATING	176 SF	ASSEMBLY - CONCENTRATED W/O FIXED SEATS (CHAIRS ONLY - NOT FIXED)	7 SF	NET	26
18	SEATING	165 SF	ASSEMBLY - CONCENTRATED W/O FIXED SEATS (CHAIRS ONLY - NOT FIXED)	7 SF	NET	24
20	CONF. 3208	284 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	19
23	CONF. 3600	428 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	29
24	MOLLENHOFF CONF.	731 SF	ASSEMBLY - UNCONCENTRATED (TABLE & CHAIRS)	15 SF	NET	49
19	COUNCIL CHAMBERS	1,109 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	8
21	CITY DEPARTMENTS	12,169 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	82
32	RESTROOMS	496 SF	BUSINESS AREAS - NON HEALTHCARE	150 SF	GROSS	4
THIRD FLOOR		16,067 SF				264
BUILDING TOTALS		48,948 SF				610

HAZARD SEPARATION REQUIREMENTS

RATING	DESCRIPTION	USE	DOORS	HVAC
0 HR	SMOKE PARTITION	COORIDOR WALLS (I-2 OCC.)	0 MIN	ALLOWED W/ NO DAMPERS
1 HR	SMOKE BARRIER	SMOKE COMPARTMENT	20 MIN	ALLOWED W/ SMOKE DAMPERS
1 HR	FIRE WALL	ROOM SEPARATION	20 MIN	ALLOWED W/ FIRE/ SMOKE DAMPERS
1 HR	FIRE BARRIER	HAZARD PROTECTION	45 MIN	ALLOWED W/ FIRE DAMPERS
1 HR	FIRE BARRIER	EXIT ENCLOSURES	60 MIN	NOT ALLOWED
1 HR	FIRE BARRIER	OCCUPANCY SEPARATION	45 MIN	ALLOWED W/ FIRE/ SMOKE DAMPERS
1 HR	FIRE BARRIER	SHAFT ENCLOSURE	45 MIN	ALLOWED W/ FIRE/ SMOKE DAMPERS
2 HR	FIRE BARRIER	OCCUPANCY SEPARATION	90 MIN	ALLOWED W/ FIRE/ SMOKE DAMPERS
2 HR	FIRE BARRIER	EXIT ENCLOSURES	90 MIN	NOT ALLOWED
2 HR	FIRE BARRIER	SHAFT ENCLOSURE	90 MIN	ALLOWED W/ FIRE/ SMOKE DAMPERS
2 HR	FIRE BARRIER	HAZARD PROTECTION	90 MIN	ALLOWED W/ FIRE DAMPERS
2 HR	FIRE WALL	BUILDING SEPARATION	90 MIN	ALLOWED W/ FIRE DAMPERS
3 HR	FIRE WALL	BUILDING SEPARATION	180 MIN	ALLOWED W/FIRE DAMPERS
4 HR	FIRE WALL	BUILDING SEPARATION	180 MIN	ALLOWED W/FIRE DAMPERS

LIFE SAFETY LEGEND:

- # — EXIT WITH OCCUPANCY LOAD NUMBER
- EXIT SIGN (EDGE LIT TYPE UNLESS OTHERWISE NOTED)
- FEC — FIRE EXTINGUISHER CABINET (FEC)
- 1 HR FIRE BARRIER
- 2 HR FIRE BARRIER
- 3 HR FIRE BARRIER
- SMOKE BARRIER
- SMOKE PARTITION
- SPRINKLERED AREA
- FDC — FIRE DEPARTMENT CONNECTION (FDC)
- FACP — FIRE ALARM CONTROL PANEL
- E — EXIT
- 20 MIN DOOR
- 30 MIN DOOR
- 45 MIN DOOR
- 60 MIN DOOR
- 90 MIN DOOR

DOOR - CODE PLAN TAG

XX OCC (USING DOOR) — DOOR LEAF WIDTH
XXX | XXX — OCC USING DOOR | EGRESS CAPACITY FACTOR
XX OCC (CAPACITY) — TOTAL AMOUNT OF OCC PERMITTED

STAIR - CODE PLAN TAG

STAIR WIDTH BETWEEN STRINGERS
XX OCC (USING STAIR) — OCC USING STAIR
XXX* | XXX — EGRESS CAPACITY FACTOR
XX OCC (CAPACITY) — TOTAL AMOUNT OF OCC PERMITTED

AREA / ROOM - CODE PLAN TAG

ROOM NAME
XX OCC — OCC LOAD
XXX — AREA
XXX (OCC FACTOR) — OCC FACTOR

LIFE SAFETY NOTES:

NOTE:
1. ALL FIRE EXTINGUISHERS SHALL BE SELECTED FOR THE CLASS OF HAZARD TO BE PROTECTED (SUPPLIED BY OWNER).
2. MAXIMUM TRAVEL DISTANCES FOR CLASS A FIRES = 75' USING A 2-A EXTINGUISHER RATING.
3. MAXIMUM TRAVEL DISTANCES FOR CLASS B FIRES = 50' USING A 80-B EXTINGUISHER RATING.

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

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DATE: 8/26/2026
SHEET SET: BID DOCUMENTS
SHEET NAME: CODE REVIEW AND LIFE SAFETY - PLANS
SHEET: G0.03

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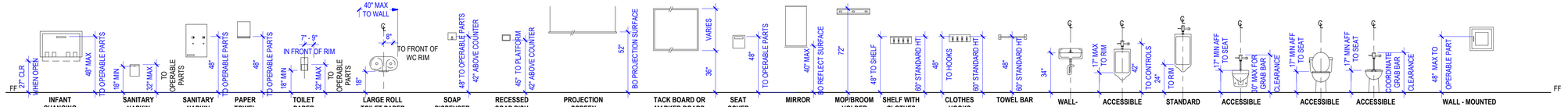
MISC. FIXTURE/ACCESSORY MOUNTING HEIGHT:

SHOWER HEAD	7'-0" TO BOTTOM OF SHOWER HEAD
COAT ROD AND SHELF	5'-6" TO TOP OF SHELF 3'-4" AND 6'-8" AT DOUBLE (ADAPTABLE AND HANDICAP) 4'-0" TO TOP OF SHELF AT SINGLE (HCP)
ELEVATOR CALL BUTTON	42" AFF TO CENTER
ROOM SIGNAGE	60" AFF TO CENTER OF SIGN
LINEN OR PANTRY W/ FIXED SHELVING	@ 4 SHELF = 16", 32", 48", 64" @ 5 SHELF = 14", 28", 42", 56", 70"
SHELF ABOVE WASHER (AND OR) DRYER	58" @ ADAPTABLE UNITS 54" @ HCP (OTHER SHELVING MUST BE PROVIDED W/O REACH OVER LAUNDRY EQUIP)
DOOR VIEWER ADA	43"
DOOR VIEWER STANDARD	60"
OUTLET	18" MIN BOTTOM OF DEVICE 48" MAX W/ NO COUNTER OBSTRUCTION 44" MAX IF OVER A COUNTER
THERMOSTATS	48" MAX TOP OF DEVICE
LIGHT SWITCHES	48" MAX AFF
ADA SIGNAGE	40" TO LESS THAN OR EQUAL TO 70" ABOVE FLOOR TO BASELINE OF CHARACTERS TACTILE CHARACTERS SHALL BE 48" MIN ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE LOWEST TACTILE CHARACTER AND 60" MAX ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE HIGHEST TACTILE CHARACTER

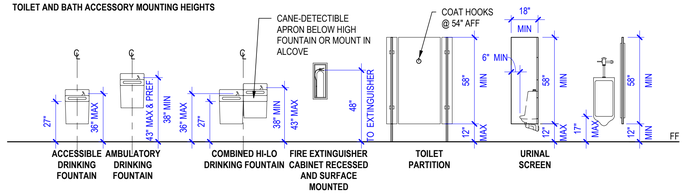
COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR MOUNTING HEIGHTS OF FIXTURES FURNISHED BY THOSE SECTIONS

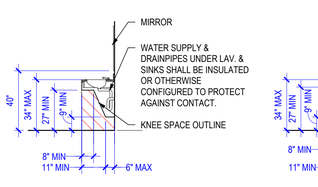
MOUNTING HEIGHT AND ACCESSORY NOTES:

1. IF ANY ACCESSORIES ARE MOUNTED ABOVE A COUNTER, THE TOP OF OPERABLE PARTS CAN BE NO HIGHER THAN 3'-8" AFF
2. SURFACE MOUNTED ACCESSORIES THAT PROJECT MORE THAN 4" FROM THE FACE OF THE WALL MUST BE MOUNTED IN AN ALCOVE, OVER A COUNTER, OR WITH THE BOTTOM EDGE NO MORE THAN 2'-3" AFF
3. WHEN MOUNTED NEAR A GRAB BAR, PROVIDE AT LEAST 2" CLEARANCE BETWEEN THE TOP OF AN ACCESSORY AND THE BOTTOM OF THE GRAB BAR OR 1'-0" CLEARANCE BETWEEN THE BOTTOM OF AN ACCESSORY AND THE TOP OF A GRAB BAR. DOES NOT APPLY TO FULLY RECESSED ACCESSORIES.
4. FOR ACCESSORIES NOT INDICATED OR DIFFERING SUBSTANTIALLY FROM THE DIAGRAMS, CONSULT THE ARCHITECT PRIOR TO INSTALLATION OF BLOCKING/ BACKING.
5. PLUMBING FIXTURES SHOWN ARE DIAGRAMMATIC. SEE PLUMBING DOCUMENTS FOR SPECIFICATIONS OF FIXTURE TO BE INSTALLED.
6. VERIFY IF SHOWER/TUB SURROUND IS PROVIDED WITH PROVISIONS FOR GRAB BAR BLOCKING ATTACHMENT.
7. ALL DIMENSIONS ARE TAKEN TO FINISHED SURFACE.
8. UNLESS SPECIFICALLY INDICATED ELSEWHERE IN THE DOCUMENTS AT DWELLING UNITS - SHOWER SEATS, SHOWER SLIDE BARS, AND GRAB BARS DO NOT NEED TO PROVIDED. BLOCKING TO WITHSTAND 250 LBS OF PULLOUT FORCE SHALL BE INSTALLED IN PREPARATION FOR FUTURE INSTALLATIONS.
9. THE FAIR HOUSING ACT REQUIRES ADDITIONAL BLOCKING IN WALLS BEYOND THE STANDARD LOCATIONS OF GRAB BARS IN COMMERCIAL CONSTRUCTION. PROVIDE BLOCKING TO ACCOMMODATE THE FULL RANGE OF MOUNTING POSSIBILITIES.
10. PROVIDE BLOCKING AT ALL BATHS AS SHOWN FOR ALL TUBS, SHOWERS, AND WATER CLOSETS OR USE FULL BACKING TUB/SHOWER SURROUND.
11. ALL BLOCKING TO BE 22 GA SHEET METAL OR WOOD BLOCKING PER GENERAL CONTRACTOR OPTION AND CONSTRUCTION TYPE, TYP.
12. ITEMS FOR WHICH MOUNTING HEIGHTS ARE INDICATED ON THIS SHEET MAY OR MAY NOT BE USED - SEE PROJECT PLANS, SPECIFICATIONS, AND INTERIOR ELEVATIONS FOR SPECIFIC PROJECT ITEMS.

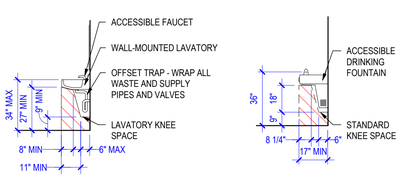


TOILET AND BATH ACCESSORY MOUNTING HEIGHTS



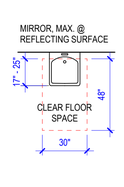


ACCESSIBLE VANITY TOP

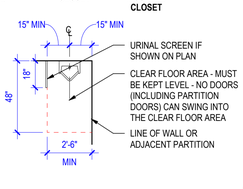


ACCESSIBLE WALL-MOUNTED LAVATORY

ACCESSIBLE DRINKING FOUNTAIN

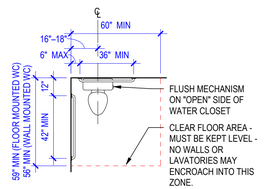


WALL-MOUNTED ACCESSIBLE LAVATORY

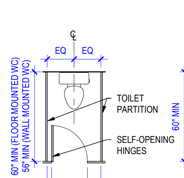


ACCESSIBLE URINAL

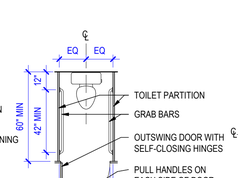
PLUMBING FIXTURE MOUNTING HEIGHTS



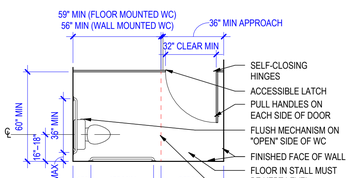
PUBLIC TOILET IN SINGLE USER ACCESSIBLE RESTROOM



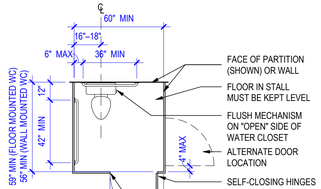
STANDARD TOILET STALL



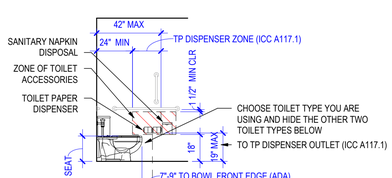
AMBULATORY TOILET STALL



ACCESSIBLE TOILET STALL WITH IN-SWINGING DOOR

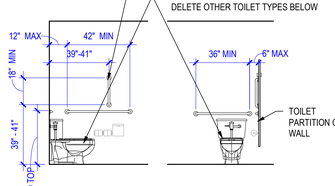


ACCESSIBLE TOILET STALL WITH OUT-SWINGING DOOR



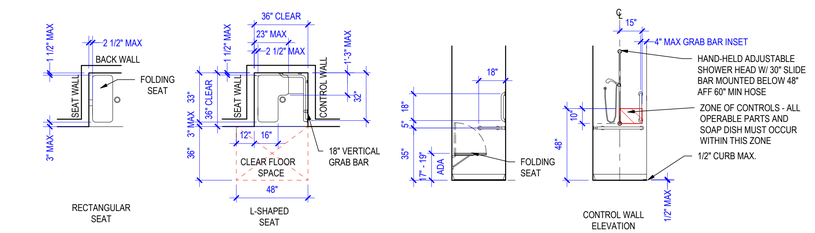
ACCESSIBLE STALL MEETING ICC-117.1 AND ADA

PUBLIC TOILET ACCESSORY REQUIREMENTS



ACCESSIBLE STALL MEETING ICC-A117.1

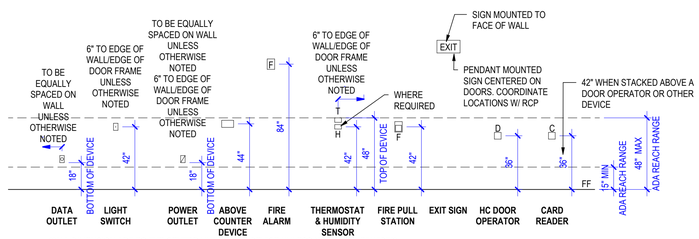
PUBLIC TOILET ACCESSIBLE GRAB BAR REQUIREMENTS



TRANSFER SHOWER

STANDARD TOILET ROOM MOUNTING HEIGHTS AND CLEARANCES

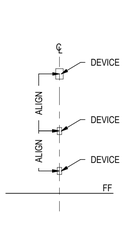
1/4" = 1'-0"



ALL DIMENSION ARE TO THE CENTER LINE OF THE DEVICE UNLESS NOTED OTHERWISE

DEVICE MOUNTING HEIGHTS

1/4" = 1'-0"



DEVICE ALIGNMENT

1/4" = 1'-0"

STANDARD RESTROOM MOUNTING HEIGHTS	
RESTROOMS	BARRIER FREE
DRINKING FOUNTAIN (SPOUT)	36"
HAND DRYER (RECESSED BOTTOM)	40"
HAND DRYER (SURFACE BOTTOM)	44"
LAVATORY AND SINK (TOP OF RIM)	35"
MIRROR, LOWER EDGE, MAX	40"
MIRROR, UPPER EDGE, MIN	--
SOAP DISPENSER (CENTER LINE)	42"
TOILET PAPER HOLDER (CENTER LINE)	19"
TOWEL DISPENSER	39"
URINAL (RIM), MAX	--
URINAL (RIM), MIN	17"
WATER CLOSET (CENTER LINE FLUSH VALVE) MIN	17"
WATER CLOSET (SEAT), MAX	19"

INVISION
PLANNING | ARCHITECTURE | INTERIORS

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Waterloo, IA 50701
319.233.8419
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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ACCESSIBILITY DETAILS & TYPICAL MOUNTING HEIGHTS

SHEET:
G0.04

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SHEET RESPONSIBILITY: Author

THIS SHEET MUST BE PRINTED IN COLOR TO VIEW CONTENT PROPERLY

DESIGN CRITERIA

1. STRUCTURE HAS BEEN DESIGNED TO COMPLY WITH 2021 AND SUBSEQUENT REFERENCE STANDARDS.
2. RISK CATEGORY: IV
3. SUPERIMPOSED DEAD LOADS:

ROOF	TYPICAL	20 PSF
	TORNADO SHELTER	11 PSF
FLOOR	TYPICAL	15 PSF

4. LIVE LOADS: LIVE LOAD REDUCTION USED AS ALLOWED PER CODE

ROOF	TYPICAL	20 PSF
	TORNADO SHELTER	370 PSF SERVICE LEVEL
FLOOR	TYPICAL	50 PSF
	CORRIDORS, STAIRS & PUBLIC AREAS	100 PSF
	PARTITION LOAD	15 PSF
	OFFICE	50 PSF
OTHER	HANDRAILS	MAX OF 50 PLF HORIZ PLUS 50 PLF VERT OR 200 LBS IN ANY DIRECTION, APPLIED AT TOP OF RAILING

5. MECHANICAL UNITS: THE CONTRACTOR SHALL CONFIRM THE ACTUAL MECHANICAL UNITS PURCHASED ARE OF WEIGHT AND SIZE SUCH THAT:
   a. THE UNIT WEIGHT IS LESS THAN OR EQUAL TO WEIGHT LISTED ON PLAN.
   b. THE UNIT LENGTH IS LESS THAN 15 FEET. IF UNIT LENGTH IS GREATER THAN 15 FEET, SNOW DRIFT ON ROOF SHALL BE ACCOUNTED FOR.
   c. THE TOTAL SUPERIMPOSED LOAD UNDER EACH UNIT DOES NOT EXCEED THE LIVE LOAD FOR WHICH THE FLOOR WAS DESIGNED IN THE FLOOR AREA WHERE THE UNIT IS LOCATED AS INDICATED BY THE EQUATION BELOW:

TOTAL SUPERIMPOSED LOAD UNDER UNIT =	TOTAL EQUIPMENT WEIGHT / UNIT FOOTPRINT AREA =	INDICATED SERVICE LEVEL DESIGN LIVE LOAD
TOTAL EQUIPMENT WEIGHT =	OPERATING WEIGHT OF UNIT + CONCRETE HOUSEKEEPING PAD + INERTIA BLOCK + OTHER ANCILLARY ITEMS ASSOCIATED WITH THE EQUIPMENT	
UNIT FOOTPRINT AREA =	EFFECTIVE AREA OF UNIT OR HOUSEKEEPING PAD, WHICHEVER IS LARGER	
EFFECTIVE AREA =	(LENGTH + 6 FEET) x (WIDTH + 6 FEET)	

CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION ON THE LOCATION OF ANY MECHANICAL UNITS WHERE THE SUPERIMPOSED LOAD UNDER THE UNIT EXCEEDS THE INDICATED DESIGN SIZE AND LOAD FOR THE ROOF AND/OR LIVE LOAD FOR THE FLOOR AS INDICATED ON THE PLAN.

6. SNOW:

GROUND SNOW	30 PSF
SNOW EXPOSURE FACTOR	1.0
THERMAL FACTOR	1.0
IMPORTANCE FACTOR	1.2
FLAT-ROOF SNOW	25.2 PSF
DESIGN SNOW	25.2 PSF PLUS DRIFT

7. SEISMIC:

SEISMIC DESIGN CATEGORY	A
IMPORTANCE FACTOR	1.50
SITE CLASS	C
S_S	0.058 g
S_1	0.048 g
S_{DS}	0.05 g
S_{D1}	0.048 g
SEISMIC FORCE RESISTING SYSTEM	ORDINARY STEEL MOMENT FRAMES/CMU SHEAR WALLS
ANALYSIS PROCEDURE	GENERAL STRUCTURAL INTEGRITY
SEISMIC RESPONSE COEFFICIENT, C_S	0.01

8. WIND:

BASIC WIND SPEED	V_{ULT} = 121 MPH V_{ASD} = 94 MPH		
EXPOSURE CLASS	C		
INTERNAL PRESSURE COEFFICIENT, GCpi	±0.18		
COMPONENTS & CLADDING:			
ROOF COMPONENTS	ZONE 1	ZONE 2	ZONE 3
SUPPORT BEAMS (A>100 SF)	50 PSF	66 PSF	66 PSF
ROOF SHEATHING (A=50 SF)	54 PSF	71 PSF	71 PSF
DECK FASTENERS (A=10 SF)	63 PSF	83 PSF	83 PSF
WALL COMPONENTS	ZONE 4	ZONE 5	
A=200 SF	33 PSF	35 PSF	
A=50 SF	36 PSF	41 PSF	
A=20 SF	38 PSF	45 PSF	

C & C NOTES:
   a. THE PRESSURES LISTED ARE IN ACCORDANCE IBC AND ASCE 7, AND THE DESIGN FORCES USED BY THE SUBCONTRACTOR FOR A SPECIFIC APPLICATION ARE THE RESPONSIBILITY OF THE SUBCONTRACTOR.
   b. WIND PRESSURES ARE ULTIMATE DESIGN LEVEL.
   c. SEE ASCE 7 FOR ZONE DEFINITIONS AND EXTENT OF ZONES. 'a' = 12.5 FT.
   d. SUBMIT DESIGN CALCULATIONS SIGNED AND SEALED BY A LICENSED ENGINEER IN THE PROJECT'S JURISDICTION FOR ANY DESIRED MODIFICATION TO THE STATED PRESSURES.

9. ICC 500 SHELTER WIND DESIGN LOADS:

CODE PROCEDURE	ASCE 7 DIRECTIONAL
WIND SPEED, V_T	250 MPH (3 SEC GUST)
INTERNAL PRESSURE COEFFICIENT, GC_{piT}	0.55
DIRECTIONALITY FACTOR, K_{dT}	1.0
IMPORTANCE FACTOR	1.0
TOPOGRAPHIC EFFECTS, Kzt	1.0
IMPACT LOAD (WALL)	15 LB MISSILE (NOMINAL 2x4) TRAVELING HORIZONTALLY AT 100 MPH AND IMPACTING THE SURFACE AT 90°
IMPACT LOAD (ROOF)	15 LB MISSILE (NOMINAL 2x4) TRAVELING HORIZONTALLY AT 100 MPH OR VERTICALLY AT 67 MPH AND IMPACTING THE SURFACE AT 90°

10. ALL LATERAL LOAD RESISTANCE AND STABILITY OF THE BUILDING IN THE COMPLETED STRUCTURE IS PROVIDED BY STEEL MOMENT FRAMES IN EACH ORTHOGONAL DIRECTION. SEE PLANS FOR LOCATIONS. THE ROOF DECK AND FLOOR SLABS SERVE AS HORIZONTAL DIAPHRAGMS DISTRIBUTING THE LATERAL FORCES TO THE VERTICAL LATERAL ELEMENTS WHICH IN TURN CARRY THE LOAD TO THE BUILDING FOUNDATIONS.
    ALL LATERAL LOAD RESISTANCE AND STABILITY OF THE SHELTER IN THE COMPLETED STRUCTURE IS PROVIDED BY REINFORCED CMU SHEAR WALLS. SEE PLANS FOR LOCATIONS. THE CONCRETE TOPPING SLAB AND PRECAST CONCRETE DECK SERVE AS HORIZONTAL DIAPHRAGMS DISTRIBUTING THE LATERAL FORCES TO THE VERTICAL LATERAL ELEMENTS WHICH IN TURN CARRY THE LOAD TO THE BUILDING FOUNDATIONS.

GENERAL

1. DURING THE CONSTRUCTION PERIOD, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PERSONNEL AND PROPERTY ON AND AROUND THE JOBSITE. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING, GUYS, ETC. IN ACCORDANCE WITH ALL NATIONAL, STATE, AND LOCAL SAFETY ORDINANCES. TEMPORARY BRACING, SHORING, GUYING, ETC. SHALL AVOID EXCESSIVE STRESSES AND HOLD STRUCTURAL ELEMENTS IN PLACE DURING CONSTRUCTION. THE STRUCTURE SHOULD NOT BE CONSIDERED STABLE UNTIL ALL STRUCTURAL ELEMENTS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. ALL DRAWINGS AND SPECIFICATIONS ARE CONSIDERED TO BE A PART OF THE CONTRACT DOCUMENTS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO THE START OF CONSTRUCTION SO A CLARIFICATION CAN BE ISSUED. ANY WORK THAT DEVIATES FROM OR IS PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS, SPECIFICATIONS, OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN EXPENSE AND AT NO EXPENSE TO THE OWNER OR THE DESIGN PROFESSIONALS.
3. THE CONTRACT DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALLOWABLE CONSTRUCTION LOADS AND FOR DETERMINING SEQUENCES OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE AND SAFETY OF WORKERS DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO: FALSEWORK, FORMWORK, STAGING, BRACING, AND SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE ARCHITECT SHALL NOT INCLUDE INSPECTION OR APPROVAL OF THE ABOVE ITEMS AND DO NOT IN ANY WAY RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITIES FOR THE ABOVE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
4. ALL DIMENSIONS AND SITE CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR AT THE JOBSITE PRIOR TO BID SUBMITTAL, START OF SHOP DRAWINGS, START OF CONSTRUCTION, AND/OR FABRICATION OF MATERIALS. IF DISCREPANCIES ARE ENCOUNTERED, OR CONDITIONS DEVELOP THAT ARE NOT COVERED BY THE CONTRACT DOCUMENTS, THE ARCHITECT SHALL BE NOTIFIED FOR CLARIFICATION.
5. STRUCTURAL SUBSTITUTIONS MAY BE ALLOWED WITH THE APPROVAL OF THE STRUCTURAL ENGINEER. SUPPLIER SHALL PROVIDE SIGNED AND SEALED DESIGN CALCULATIONS OR SUITABLE PRODUCT LITERATURE FOR THE COMPONENTS. ALL PRODUCT SUBSTITUTIONS SHALL INCLUDE A CODE EVALUATION REPORT SPECIFIC TO THE BUILDING CODE LISTED IN THE DESIGN CRITERIA.
6. STRUCTURAL DRAWINGS INCLUDE DESIGN REQUIREMENTS AND DIMENSIONS FOR STRUCTURAL INTEGRITY BUT DO NOT SHOW ALL DETAIL DIMENSIONS TO FIT INTRICATE ARCHITECTURAL AND MECHANICAL DETAILS. CONTRACTOR SHALL CONSTRUCT THE WORK SO IT WILL CONFORM TO THE CLEARANCES REQUIRED BY ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DESIGN.
7. ALL SYMBOLS AND ABBREVIATIONS USED ON THE DRAWINGS ARE CONSIDERED TO BE CONSTRUCTION STANDARDS. IF CLARIFICATION IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO PROCEEDING WITH THE WORK.
8. DO NOT SCALE DRAWINGS. PRINTED DIMENSIONS HAVE PRECEDENCE OVER SCALED DRAWINGS AND LARGE-SCALE OVER SMALL-SCALE DRAWINGS. CONTRACTOR TO DETERMINE FINAL DIMENSION WITH ARCHITECT.
9. TYPICAL DETAILS SHALL APPLY TO SITUATIONS OCCURRING ON THE PROJECT THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY REFERENCED. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK.
10. SEE ARCHITECTURAL, ELECTRICAL, AND MECHANICAL DRAWINGS FOR DETAILS, CONDITIONS, PITS, TRENCHES, PADS, DEPRESSIONS, ROOF / FLOOR OPENINGS, TOP OF WALL ELEVATIONS, STAIRS, SLEEVES, ITEMS TO BE EMBEDDED OR ATTACHED TO STRUCTURAL ELEMENTS, ETC., NOT SHOWN ON THE STRUCTURAL DRAWINGS. FOR THESE NON-STRUCTURAL ELEMENTS SHOWN ON STRUCTURAL DRAWINGS, THEY ARE FOR GENERAL INFORMATION ONLY.
11. COORDINATE FLOOR FINISH INCLUDING, BUT NOT LIMITED TO THE "FLATNESS" AND "LEVELNESS" REQUIREMENTS, WITH THE FLOOR FINISH CONTRACTOR. PROVIDE UNDERLAYMENT / TOPPING WHERE REQUIRED TO PROVIDE A SURFACE ACCEPTABLE FOR INSTALLATION OF FLOOR FINISHES. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
12. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR MECHANICAL, ELECTRICAL, AND PLUMBING WITH APPROPRIATE TRADE CONTRACTORS. OPENING SIZES AND LOCATIONS SHOWN FOR DUCTS, PIPE, INSERTS, AND OTHER PENETRATIONS WHEN SHOWN ARE FOR GENERAL INFORMATION ONLY AND SHALL BE VERIFIED PRIOR TO FORMING.
13. THE EXACT WEIGHTS, DIMENSIONS, AND LOCATIONS OF ALL MECHANICAL UNITS AND ELECTRICAL GEAR SUPPORTED ON STRUCTURAL FRAMING SHALL BE DETERMINED AND COORDINATED BY THE CONTRACTOR PRIOR TO DETAILING THE STRUCTURAL FRAMING SUPPORTING THOSE UNITS. IF THE UNIT WEIGHTS ARE GREATER THAN THE WEIGHTS SHOWN ON THE STRUCTURAL DRAWINGS, THE STRUCTURAL ENGINEER SHALL BE NOTIFIED PRIOR TO DETAILING THE STRUCTURE. UNIT WEIGHTS, DIMENSIONS, AND LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE APPROXIMATE ONLY AND SHALL NOT BE USED FOR DETAILING THE STRUCTURE.
14. PROVIDE TEMPORARY BLOCKOUTS AND TEMPORARY OPENINGS IN THE STRUCTURE AS REQUIRED TO PERMIT INSTALLATION OF ALL WORK. BLOCKOUTS AND TEMPORARY OPENINGS SHALL BE LOCATED, CONFIGURED, DETAILED, AND INFILLED IN A MANNER THAT ALTERS NEITHER THE STRENGTH OF THE STRUCTURAL FRAMING NOR THE STRENGTH OF CONNECTIONS. INFILL ALL BLOCKOUTS AND TEMPORARY OPENINGS USING THE MATERIALS SPECIFIED FOR THE FRAMING AT THE LOCATIONS WHERE THE BLOCKOUTS AND OPENINGS OCCUR. SUBMIT DRAWINGS INDICATING THE LOCATIONS, DIMENSIONS, AND DETAILS OF ALL PROPOSED BLOCKOUTS AND OPENINGS AND DETAILS INDICATING THE MANNER IN WHICH THE BLOCKOUTS AND OPENINGS WILL BE INFILLED.
15. NO HOLES, NOTCHES, BLOCK-OUTS, ETC. ARE ALLOWED IN STRUCTURAL ELEMENTS UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS OR APPROVED BY THE STRUCTURAL ENGINEER.
16. PENETRATIONS IN CONCRETE SHALL BE CAST-IN-PLACE AND SHALL NOT BE PERMITTED EXCEPT AS SHOWN IN THE STRUCTURAL DRAWINGS.
17. BEFORE SUBMITTING A PROPOSAL FOR THIS WORK, CONTRACTOR SHALL VISIT THE PREMISES AND BECOME FULLY ACQUAINTED WITH FIELD CONDITIONS, TEMPORARY CONSTRUCTION REQUIRED, QUANTITIES AND TYPE OF EQUIPMENT, ETC. THE PROPOSAL SHALL INCLUDE ALL SUMS REQUIRED TO DO THE WORK.
18. ELEMENTS SUCH AS NON-BEARING PARTITIONS, ETC. ATTACHED TO AND/OR SUPPORTED BY THE STRUCTURE SHALL TAKE INTO ACCOUNT DEFLECTIONS AND OTHER STRUCTURAL MOVEMENTS. THE STRUCTURAL FRAMING WAS DESIGNED TO LIMIT DRIFT AND DEFLECTION OF THE STRUCTURAL SYSTEM TO LESS THAN THE MAXIMUM PERMITTED DEFLECTIONS LISTED IN THE BUILDING CODE. THE CONTRACTOR SHALL COORDINATE THE WORK OF OTHER TRADES TO ACCOMMODATE THESE DEFLECTIONS AND TO ACCOMMODATE CONSTRUCTION TOLERANCES.
19. TOPS OF ALL MASONRY WALLS SHALL BE CONNECTED TO THE UNDERSIDE OF THE STRUCTURAL FRAMING PER DETAILS PROVIDED ON THE STRUCTURAL DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF SUCH WALLS.
20. FIRE PROTECTION FOR ALL STRUCTURAL PARTS SHALL BE PROVIDED AS SPECIFIED BY THE ARCHITECTURAL DRAWINGS. UL FIRE RESISTANCE RATING RESTRAINT CLASSIFICATION AS FOLLOWS:
    a. "PRIMARY STRUCTURAL FRAME", AS DEFINED BY IBC SECTION 202 IS "RESTRAINED" EXCEPT AS INDICATED IN FOLLOWING NOTE
    b. THE FOLLOWING FRAMING IS "UNRESTRAINED":
        1. FRAMING SUPPORTED BY BEARING WALLS, OTHER THAN CAST-IN-PLACE CONCRETE WALLS, IN END BAYS AND OTHER LOCATIONS WHERE THE END OF THE FRAMING IS NOT ABUTTING FRAMING IN AN ADJACENT BAY.
        2. HOLLOW CORE SLABS IN END BAYS AND OTHER LOCATIONS WHERE THE END OF THE SLAB IS NOT ABUTTING SLABS IN AN ADJACENT BAY.
        3. STEEL JOISTS IN END BAYS ON ROOFS SUPPORTING STEEL DECK.
        4. ALL WOOD CONSTRUCTION.

SUBMITTALS

1. SUBMITTALS ARE:
   a. CONCRETE MIX DESIGNS
   b. MATERIAL PRODUCT DATA FOR STRUCTURAL MATERIALS
   c. CONCRETE AND MASONRY REINFORCING
   d. STEEL FABRICATION AND MISCELLANEOUS METALS
   e. JOISTS AND JOIST GIRDERS
   f. PRECAST CONCRETE PLANK
2. SUBMITTALS SHALL BE REVIEWED AND COORDINATED PRIOR TO SUBMITTING TO THE ARCHITECT. EACH SHOP DRAWING SUBMITTED SHALL BE STAMPED INDICATING REVIEW BY THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR AND REVIEW BY THE ARCHITECT SHALL NOT BEGIN UNTIL THIS IS COMPLETE. WORK SHALL NOT BEGIN WITHOUT REVIEW BY THE DESIGN PROFESSIONALS.
3. SUBMITTALS SHALL BE REVIEWED BY THE DESIGN PROFESSIONALS FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT ONLY. NOTATIONS MADE BY THE DESIGN PROFESSIONALS ON THE SHOP DRAWINGS DO NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE REQUIREMENTS OF THE DRAWINGS.
4. FOR ADDITIONAL INFORMATION ON REQUIRED SUBMITTALS, SEE INDIVIDUAL MATERIAL SECTIONS.

DELEGATED DESIGN

1. DELEGATED DESIGNS PER SECTION 107.3.4.1 SHALL BE SUBMITTED THE DESIGN PROFESSIONALS AND REVIEWED PRIOR TO INSTALLATION.
2. DELEGATED DESIGNS ARE:
   a. EXCAVATION, SHORING, AND UNDERPINNING (NO SUBMITTAL)
   b. PRECAST CONCRETE ELEMENTS AND CONNECTIONS
   c. STEEL JOISTS AND JOIST GIRDERS
   d. STRUCTURAL STEEL CONNECTIONS
   e. CURTAIN WALL AND STOREFRONT SYSTEMS
   f. ROOFTOP EQUIPMENT ANCHORAGE AND CURBS
   g. STAIRS, ACCESS LADDERS, HANDRAILS, GUARDRAILS, AND GRATING
   h. BUILDING MAINTENANCE DAVIT PEDESTALS, TIE-BACKS, AND FALL ARREST SYSTEMS
3. ALL DELEGATED DESIGNS SHALL BE SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE PROJECT'S JURISDICTION RESPONSIBLE FOR THE PREPARATION OF THESE DOCUMENTS.
4. STAIRS:
   a. STEEL STAIRS IN STEEL FRAMED STRUCTURES SHALL BE CONFIGURED SO THE STAIR STRINGERS CONNECT TO THE WEBS OF SUPPORTING STRUCTURAL STEEL FLOOR FRAMING MEMBERS. STAIR STRINGERS MAY NOT CONNECT TO SLABS ON DECK. STAIR STRINGER AND HANGER CONNECTIONS SHALL BE CONFIGURED SO THEY CONNECT TO THE SUPPORTING STRUCTURAL STEEL IN A MANNER THAT IMPOSES NO TORSION UPON THE SUPPORTING STRUCTURAL MEMBER. WHERE STAIR HANGERS MUST FRAME ECCENTRIC TO THE SUPPORTING STEEL, SUPPLEMENTAL FRAMING SHALL BE PROVIDED AS INDICATED ON THE CONTRACT DOCUMENTS TO PREVENT TORSION ON THE SUPPORTING STEEL FRAMING.
   b. DESIGN FRAMING MEMBERS IN COMMUNICATING STAIRS AND MONUMENTAL STAIRS TO LIMIT LIVE LOAD DEFLECTION TO THE SMALLER OF L/600 OR 1/4". SIZE STAIR FRAMING MEMBERS TO PROVIDE A STAIR ASSEMBLY WITH A NATURAL FREQUENCY > 5 HERTZ AND PEAK ACCELERATION, ap/g = 0.015, AS COMPUTED PER AISC DESIGN GUIDE 11 EQUATION 2.3 USING INDOOR FOOTBRIDGE CRITERIA.
   c. SEE ARCHITECTURAL DRAWINGS FOR STEEL STAIR DETAILS. DESIGN OF FRAMING MEMBERS AND CONNECTIONS TO BE BY SPECIALTY ENGINEER, WORKING DIRECTLY WITH THE STAIR DETAILER AND FABRICATOR. WHERE SUPPORT POSTS ARE REQUIRED, PROVIDE 3'-0" SQUARE x 1'-0" THICKENED SLAB WITH (4)#5 BOTTOM AT BASE OF STAIR.
5. FACADE:
   a. DESIGN AND DETAILING OF THE FACADE SYSTEM AND CONNECTIONS TO THE STRUCTURE SHALL TAKE INTO CONSIDERATION THE FOLLOWING MOVEMENTS:
      1. ±1/2" VERTICAL DIFFERENTIAL DEFLECTION OF SLAB EDGES ON ADJACENT FLOORS
      2. ±1/2" HORIZONTAL DIFFERENTIAL DEFLECTION BETWEEN ADJACENT FLOORS
      3. DIFFERENTIAL THERMAL EXPANSION / CONTRACTION BETWEEN FACADE SYSTEM AND SUPPORTING PRIMARY STRUCTURAL SYSTEM
      4. THE FACADE SHALL NOT BE INSTALLED UNTIL AFTER THE SUPERSTRUCTURE HAS BEEN PLUMBED, ALL FRAMING CONNECTIONS HAVE BEEN INSTALLED, AND ALL SHORES AND RESHORES HAVE BEEN REMOVED.
      5. WHERE STRUCTURAL STEEL HORIZONTAL GIRTS ARE PROVIDED, THOSE GIRTS MAY BE USED ONLY TO RESIST LATERAL LOADS FROM THE FACADE. VERTICAL LOADS MAY NOT BE IMPOSED BY THE FACADE UPON THE GIRT FRAMING UNLESS THE SECTIONS AND DETAILS ON THE STRUCTURAL DRAWINGS SPECIFICALLY INDICATE THAT FACADE GRAVITY LOAD CONNECTIONS MAY BE MADE TO THE GIRTS.

EXISTING CONDITIONS / DEMOLITION

1. EXISTING CONDITIONS:
   a. EXISTING STRUCTURAL INFORMATION SHOWN WAS OBTAINED FROM EXISTING DRAWINGS DATED MARCH 31, 1998 BY AHTS.
   b. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE. CONTRACTOR TO VERIFY EXISTING INFORMATION, DIMENSIONS, AND SIZES AS REQUIRED TO COMPLETE THEIR WORK. WHERE ACTUAL CONDITIONS CONFLICT WITH THE DRAWINGS, THEY SHALL BE REPORTED TO THE ARCHITECT SO CLARIFICATION MAY BE MADE. MODIFICATION OF CONSTRUCTION DETAILS SHALL NOT BE MADE WITHOUT WRITTEN APPROVAL OF THE ARCHITECT.
2. ALL DEMOLITION SHALL BE CARRIED OUT IN SUCH A WAY TO PREVENT DAMAGE TO EXISTING ELEMENTS WHICH ARE TO REMAIN.
3. ALL ELEMENTS WHICH ARE TO REMAIN AND WHICH ARE DAMAGED DURING DEMOLITION WORK SHALL BE REPLACED AT NO ADDED COST. CONTRACTOR SHALL PROVIDE AND BE RESPONSIBLE FOR THE PROTECTION AND REPAIR OF ADJACENT EXISTING SURFACES AND AREAS WHICH MAY BE DAMAGED AS A RESULT OF NEW WORK.
4. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS OF EXISTING STRUCTURE AND SITES THAT ARE AFFECTED BY NEW WORK BEFORE PROCEEDING WITH FABRICATION AND CONSTRUCTION.
5. ALL CONSTRUCTION IS NEW UNLESS IDENTIFIED AS EXISTING, "(E)". THE CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING INFORMATION AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO FABRICATION OF ANY STRUCTURAL COMPONENT. NEW SLABS ARE TO BE AT THE SAME ELEVATIONS AS ADJACENT EXISTING SLABS UON. FOUNDATION ELEVATIONS OR COLUMN LENGTHS SHALL BE ADJUSTED WITH THE APPROVAL OF THE STRUCTURAL ENGINEER TO ACHIEVE MATCHING SLAB ELEVATIONS.
6. REINFORCING STEEL IN EXISTING CONCRETE SHALL BE LOCATED PRIOR TO INSTALLATION OF NEW OPENINGS OR CORING OF HOLES IN THE CONCRETE. REINFORCING STEEL MAY NOT BE CUT WITHOUT APPROVAL FROM THE ENGINEER.

EARTHWORK

1. FOUNDATION DESIGN IS IN ACCORDANCE WITH THE INFORMATION SHOWN ON THE EXISTING BUILDING DRAWINGS. NO NEW GEOTECHNICAL REPORT HAS BEEN PROVIDED BY THE OWNER FOR THIS PROJECT.
2. SOIL PROPERTIES:

FROST DEPTH	3.5 FT (HEATED) 4.0 FT (UNHEATED)

3. A GEOTECHNICAL ENGINEER SHALL BE EMPLOYED TO VERIFY THAT THE PRESUMED ALLOWABLE BEARING PRESSURE WILL BE ACHIEVED PRIOR TO CONSTRUCTION. THAT ENGINEER SHALL DEVELOP AND ENSURE IMPLEMENTATION OF A SITE SUBGRADE PREPARATION PROGRAM AS REQUIRED TO ACHIEVE THE PRESUMED SOIL BEARING PRESSURE. FOOTING AND SLAB-ON-GRADE SUBGRADE PREPARATION SHALL BE IN COMPLIANCE WITH THE APPLICABLE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.
4. ANY TESTS, INSPECTIONS, FIELD OBSERVATIONS, OR APPROVAL FROM THE GEOTECHNICAL ENGINEER SHALL BE PERFORMED PRIOR TO PLACEMENT OF CONCRETE. ALTERATIONS TO SITE PREPARATION OR GRADING SHALL BE REPORTED TO THE GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.
5. PROPERTY LINE LOCATIONS INDICATED ON FOUNDATION PLANS ARE APPROXIMATE. SEE ARCHITECTURAL AND/OR SITE DRAWINGS FOR LOCATION OF THE STRUCTURE ON THE SITE.
6. ALL EXCAVATIONS SHALL BE PROPERLY AND SAFELY BACKFILLED. DO NOT PLACE BACKFILL BEHIND RETAINING / BASEMENT WALLS BEFORE CONCRETE HAS ATTAINED SPECIFIED COMPRESSIVE STRENGTH. CONTRACTOR SHALL BRACE OR PROTECT ALL WALLS BELOW GRADE FROM LATERAL LOADS UNTIL SUPPORTING FLOORS ARE COMPLETELY IN PLACE AND HAVE ATTAINED 7-DAY STRENGTH MINIMUM. BACKFILLING IS NOT PERMITTED FOR FOUNDATION WALLS UNTIL SUPPORTED SLAB TOP AND BOTTOM ARE IN PLACE OR THE WALL IS ADEQUATELY BRACED TO RESIST LATERAL LOADS.
7. CONTRACTOR SHALL PROVIDE DE-WATERING OF EXCAVATIONS FROM SURFACE WATER, GROUNDWATER, OR SEEPAGE. DETAILS OF GROUNDWATER PROCEDURES SHALL BE IMPLEMENTED AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
8. PROVIDE SHORING WHERE THERE IS INSUFFICIENT SPACE FOR STABLE-SLOPED EMBANKMENTS.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING, SHORING, ETC. REQUIRED FOR CONSTRUCTION OF THE PROJECT AND SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES. CALCULATIONS AND SHOP DRAWINGS SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE PROJECT'S JURISDICTION.
10. CONTRACTOR SHALL INVESTIGATE SITE DURING CLEARING AND EARTHWORK OPERATIONS FOR FILL MATERIAL OR BURIED STRUCTURES SUCH AS CESSPOOLS, CISTERNS, AND FOUNDATIONS. IF ANY SUCH MATERIAL OR STRUCTURES ARE FOUND, ARCHITECT SHALL BE NOTIFIED IMMEDIATELY.
11. ANY REQUIRED IMPORT FILL SHALL HAVE A LOW POTENTIAL FOR EXPANSION AND SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO IMPORTING.
12. UTILITY LINES SHALL NOT BE PLACED THROUGH OR BELOW FOUNDATIONS WITHOUT THE STRUCTURAL ENGINEER'S APPROVAL. BELOW GRADE UTILITY OR PIPE ELEVATIONS, WHERE SHOWN, ARE INDICATED FOR REFERENCE ONLY. REQUIRED ELEVATIONS SHALL BE DETERMINED BY OTHERS AND COORDINATED WITH THE FOUNDATIONS.
13. WHERE GRADE ELEVATIONS ARE APPROXIMATELY EQUAL ON BOTH SIDES OF WALLS, BACKFILL SHALL BE PLACED SO THAT IT IS NOT UNBALANCED BY MORE THAN 2 FEET ON EITHER SIDE.
14. ALL REQUIRED BACKFILL AND UTILITY TRENCH BACKFILL WITHIN THE BUILDING AREA SHALL BE COMPACTED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER.

DRILLED CONCRETE PIERS

1. DRILLED PIERS HAVE BEEN DESIGNED FOR THE FOLLOWING NET ALLOWABLE SERVICE LOADS:

END BEARING	25000 PSF
SKIN FRICTION	1000 PSF
MINIMUM EMBEDMENT	4 FT INTO WEATHERED LIMESTONE
MINIMUM PIER LENGTH	8 FT

2. ACTUAL BEARING CAPACITY SHALL BE VERIFIED BY AN EXPERIENCED, QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACING CONCRETE.
3. DRILLED PIERS SHALL BE ACCURATELY CENTERED AT THE PROPER LOCATIONS AND INSTALLED PLUMB. INSTALL TO THE FOLLOWING TOLERANCES:

TOP ELEVATION	+1" AND -3"
PLUMB	WITHIN 1%
PIER CENTERLINE	WITHIN 1" FOR 18"Ø OR LESS WITHIN 3" FOR GREATER THAN 18"Ø

4. THE ELEVATION IDENTIFYING THE BOTTOM OF SHAFT IS AN APPROXIMATE ELEVATION TO BE USED FOR ESTIMATING PURPOSES ONLY. THE ACTUAL BOTTOM OF SHAFT ELEVATIONS WILL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER AND TESTING AND INSPECTION AGENCY.
5. PIERS SHALL BE DRILLED IN PLACE AND FILLED WITH CONCRETE AFTER DATA IS RECORDED, AND APPROVAL OF BEARING SURFACE IS OBTAINED. THE BED AND SHAFT SHALL BE LEVELED AND CLEARED OF LOOSE MATERIAL BEFORE THE CONCRETE IS PLACED. THE SHAFT SHALL BE KEPT FREE OF WATER. EXCAVATIONS SHALL NOT BE LEFT OPEN OVERNIGHT.
6. PLACE CONCRETE CONTINUOUSLY WITHOUT INTERRUPTION, VIBRATING NO LESS THAN THE TOP 5 FEET OF EACH SHAFT.
7. BEARING AND SKIN FRICTION CAPACITIES SHALL BE VERIFIED BY THE GEOTECHNICAL ENGINEER AND TESTING AND INSPECTION AGENCY.
8. THE TESTING AND INSPECTION AGENCY AND CONTRACTOR SHALL MAINTAIN A RECORD OR LOG OF EACH DRILLED PIER AS INSTALLED SHOWING LOCATION, TOP AND BOTTOM ELEVATIONS, SHAFT AND BELL DIAMETERS, DATE CONCRETE IS POURED, AND ANY OTHER PERTINENT INFORMATION.
9. NOTIFY THE ARCHITECT IMMEDIATELY IF OBSTRUCTIONS ARE ENCOUNTERED.
10. SPOIL MATERIAL FROM DRILLED PIER INSTALLATION SHALL NOT BE USED AS FILL MATERIAL AND SHALL BE REMOVED FROM WITHIN THE PROJECT PROPERTY LIN

REINFORCING STEEL

1. ALL REINFORCING STEEL SHALL BE DETAILED AND PLACED IN CONFORMANCE WITH ACI 318, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", AND ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE", UON.
2. CONCRETE REINFORCING STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS:

REINFORCING STEEL UON	ASTM A615, GR 60	Fy=60 KSI
WELDED REINFORCING STEEL	ASTM A706, GR 60	Fy=60 KSI
WELDED WIRE REINFORCING	ASTM A1064	Fy=65 KSI
STEEL WIRE	ASTM A1064	Fy=60 KSI
MECHANICAL COUPLERS	TYPE 2	Fy=1.25xDEFORMED BAR TENSILE STRENGTH
HEADED STEEL STUD SHEAR REINFORCING	ASTM A1044	Fy=51 KSI

3. MINIMUM CONCRETE COVER SHALL BE PROVIDED AS FOLLOWS TO THE OUTERMOST REINFORCING BARS:

CONCRETE EXPOSURE	MEMBER	REINFORCEMENT	COVER (IN)
CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND	ALL	ALL	3
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	ALL	#6 TO #18	2
		#5 AND SMALLER	1 1/2
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLABS, JOISTS, AND WALLS	#14 & #18	1 1/2
		#11 AND SMALLER	3/4
	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINF, STIRRUPS, TIES, SPIRALS, AND HOOPS	1 1/2
OTHER	BOUNDARY ELEMENTS	ALL	1 1/2
	PARKING LEVEL SLABS	TOP BARS	1 1/2
		BOTTOM BARS	1

4. REINFORCING STEEL SHALL BE INSTALLED TO WITHIN THE FOLLOWING TOLERANCES. INDICATED TOLERANCES ARE PER ACI 117, "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS".

ITEM FOR WHICH TOLERANCE IS BEING MEASURED	PERMITTED TOLERANCE
CONCRETE COVER FOR SLAB TOP AND BOTTOM BARS	±1/4"
COVER FOR OTHER REINFORCING STEEL	±3/8"
SPECIFIED SPACING BETWEEN PARALLEL BARS IN SLAB	± (SPECIFIED SPACING/4) BUT NOT TO EXCEED 1"
HORIZONTAL DEVIATION FROM SPECIFIED LOCATION UON	±3"
SPACING AND LOCATION OF BEAM STIRRUPS	± (BEAM DEPTH IN INCHES/12) x 1"
SPACING AND LOCATION OF COLUMN TIES	± (MINIMUM COLUMN DIMENSION IN INCHES/12) x 1"
LOCATION OF ENDS OF BARS PERPENDICULAR TO SLAB EDGES	±1"
HORIZONTAL LOCATION OF PRESTRESSED TENDONS	±1/2" FOR MEMBER DEPTH = 24" ±1" FOR MEMBER DEPTH > 24"
VERTICAL LOCATION (DRAPE) OF PRESTRESSED TENDONS	±1/4" FOR MEMBER DEPTH = 8" ±3/8" FOR MEMBER DEPTH 8" < D = 24" ±1/2" FOR MEMBER DEPTH > 24"

THE ABOVE LIST OF PERMITTED TOLERANCES SHALL BE PROVIDED ON ALL REINFORCING STEEL PLACING DRAWINGS AND ON ALL POST-TENSIONED TENDON PLACING DRAWINGS. PLACING DRAWINGS THAT DO NOT PROVIDE THIS LIST OF TOLERANCES WILL BE REJECTED.

5. FIELD BENDING OF REINFORCING STEEL IS NOT PERMITTED UON.
6. WELDING OF REINFORCING STEEL OTHER THAN A706 IS PROHIBITED. WELDING OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH AWS D1.4 OR D1.8.
7. SUPPORTS AND TIE WIRE FOR COATED REINFORCING SHALL BE PLASTIC PROTECTED. SUPPORTS AND TIE WIRE FOR STAINLESS OR GALVANIZED REINFORCING SHALL BE STAINLESS OR GALVANIZED STEEL PROTECTED RESPECTIVELY. SUPPORTS AND TIE WIRE FOR UNCOATED REINFORCING SHALL BE PLAIN WIRE, NO PROTECTION.
8. ALL WELDED WIRE REINFORCING SHALL BE LAP SPLICED 2 PANELS (1'-0" MIN).
9. SPLICING:
   a. SPLICES IN REINFORCING STEEL SHALL BE MADE ONLY AT THOSE LOCATIONS WHERE SPLICES ARE SHOWN ON THE STRUCTURAL DRAWINGS AND AT THOSE LOCATIONS WHERE SPLICES HAVE BEEN DETAILED ON THE REINFORCING STEEL PLACING DRAWINGS THAT HAVE BEEN REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER. ALL SPLICES SHALL BE CLASS B TENSION LAP SPLICES UON.
   b. MECHANICAL SPLICE COUPLERS MAY BE USED INSTEAD OF TENSION LAP SPLICES AT THE CONTRACTOR'S OPTION AT ANY LOCATION. MECHANICAL SPLICE COUPLERS MUST BE USED WHERE SPLICING #14 AND LARGER BARS, INCLUDING WHERE SPLICING #14 AND LARGER BARS TO #11 AND SMALLER BARS. STAGGER MECHANICAL SPLICES IN ADJACENT BARS 30" MINIMUM.
   c. COMPRESSION LAP SPLICES MAY BE USED ONLY AT THOSE LOCATIONS WHERE SUCH SPLICES ARE SPECIFICALLY INDICATED. STAGGER SPLICES WHERE REQUIRED TO PROVIDE 1 1/2" MINIMUM CLEAR SPACING BETWEEN REINFORCING STEEL AT SPLICE LOCATIONS.
10. ALL HOOKS SHALL BE STANDARD HOOKS OR STANDARD STIRRUP HOOKS UON. STANDARD STIRRUP HOOKS SHALL HAVE CONTINUOUS BAR AT INSIDE CORNER OF HOOK.
11. VERTICAL REINFORCING STEEL IN CONCRETE AND MASONRY WALLS WITH ONE LAYER OF REINFORCING BARS SHALL BE INSTALLED IN THE CENTER OF THE WALL UON.
12. WHEN BAR HOOK LENGTHS EXCEED SLAB THICKNESS, TILT HOOKS DURING INSTALLATION. TILTED HOOKS SHALL MAINTAIN THE SPECIFIED MINIMUM CONCRETE COVER.
13. STANDARD STIRRUP HOOKS FOR #3, #4, AND #5 BARS SHALL BE PROVIDED IN SLABS LESS THAN 9" THICK.
14. DOWELS SHALL MATCH GRADE, SIZE, SPACING, AND QUANTITY OF LAPPED REINFORCING STEEL UON. EXTEND ALL DOWELS FOR FULL DEPTH OF SUPPORTING ELEMENT AND PROVIDE HOOKS UON. DOWELS SHALL NOT BE POST-INSTALLED INTO FRESH CONCRETE.
15. FIELD CUTTING OF REINFORCING STEEL IS PROHIBITED UNLESS INDICATED ON THE REINFORCING PLACING DRAWINGS.
16. HEATING OF BARS FOR BENDING IS PROHIBITED.
17. REINFORCING STEEL PLACING DRAWINGS SHALL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 315. THE PLACING DRAWINGS SHALL SHOW ALL INFORMATION NECESSARY TO FABRICATE AND PLACE THE REINFORCING STEEL.
18. REINFORCING STEEL SPACINGS ARE CENTER-TO-CENTER DIMENSIONS UON. REINFORCING STEEL SHOWN IN SECTION PERPENDICULAR TO THE CUT ARE CONTINUOUS UON.
19. THE SPACING OF ALL REINFORCING STEEL MUST BE COMPUTED BY THE REINFORCING STEEL DETAILER AND MUST BE INDICATED ON THE PLACING DRAWINGS. EXTENT ARROWS MUST BE USED TO CLEARLY INDICATE THE LOCATIONS WHERE GROUPS OF REINFORCING BARS ARE TO BE INSTALLED.
20. A LIST OF ALL APPLICABLE REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE INDICATED ON ALL REINFORCING STEEL PLACING DRAWINGS. PLACING DRAWINGS THAT DO NOT SHOW SUFFICIENT INFORMATION NEEDED TO PLACE THE REINFORCING STEEL WILL BE REJECTED.

CAST-IN-PLACE CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, AND ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE UON.
2. CONCRETE MATERIALS SHALL CONFORM TO:

PORTLAND LIMESTONE CEMENT	ASTM C595, TYPE IL
FLY ASH	ASTM C618, TYPE C OR F
FINE AND COARSE AGGREGATE	ASTM C33
WATER	POTABLE
AIR-ENTRAINING ADMIXTURE	ASTM C260
WATER REDUCING ADMIXTURE	ASTM C494

3. CONCRETE STRENGTHS SHALL CONFORM TO:

COMPONENT	f'c AT 28 DAYS[1] (PSI)	MAX PERMITTED W/C	EXPOSURE CLASS
SHALLOW FOUNDATIONS	4500	0.45	F2, S0, W0, C0
DRILLED PIERS	3000	0.60	F0, S0, W0, C0
GRADE BEAMS, EXTERIOR SLABS	4500	0.45	F2, S0, W0, C0
INTERIOR SLAB-ON-GRADE	3500	0.50	F0, S0, W0, C0
NORMAL-WEIGHT SLAB ON DECK	3500	0.50	F0, S0, W0, C0
STRUCTURAL TOPPING SLABS	3500	0.55	F1, S0, W0, C0

[1]IF ALTERNATE VALUES ARE INDICATED ON PLANS OR DETAILS FOR SPECIFIC CONDITIONS. THEY SHALL BE USED IN LIEU OF THOSE LISTED IN THE TABLE.

4. AIR ENTRAINMENT:

NOMINAL MAXIMUM AGGREGATE SIZE	REQUIRED AIR CONTENT PER EXPOSURE CATEGORY	
	F1	F2
3/8"	6%	7.5%
1/2"	5.5%	7%
3/4"	5%	6%
1"	4.5%	6%

   a. AIR ENTRAINMENT SHALL CONFORM TO UL RATING REQUIREMENTS FOR FIRE RESISTANCE.

5. REQUIRED NOMINAL MAXIMUM COARSE AGGREGATE SIZE:

CONCRETE ELEMENT	REQUIRED NOMINAL MAXIMUM COARSE AGGREGATE SIZE*
ALL CONCRETE UON	1"
TOPPING SLABS LESS THAN 3" THICK	3/8"

* SMALLER NOMINAL MAXIMUM COARSE AGGREGATE SIZE SHALL BE USED WHERE REQUIRED PER ACI 318.

6. ALL FOUNDATION ELEMENTS SHALL BE CENTERED UNDER WALLS, PIERS, OR COLUMNS UON.
7. "ROUGH JOINTS" ARE JOINTS ROUGHENED TO AN AMPLITUDE OF 1/4" AND FREE AND CLEAN OF LAITANCE. PROVIDE ROUGH JOINTS AT ALL CONSTRUCTION JOINTS UON.
8. CONTRACTOR SHALL SUBMIT PROPOSED LOCATIONS OF ALL CONSTRUCTION JOINTS WHERE JOINTS ARE NOT INDICATED ON THE DRAWINGS.
9. CONSTRUCTION JOINTS IN CAST-IN-PLACE CONCRETE SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF SPAN. PROPOSED CONSTRUCTION JOINT LOCATIONS SHALL BE SHOWN ON REINFORCING STEEL PLACING DRAWINGS. ANY STOP IN CONCRETE WORK MUST BE MADE WITH VERTICAL BULKHEADS AND HORIZONTAL KEYS UON. ALL REINFORCING TO BE CONTINUOUS THROUGH JOINTS UON.
10. HORIZONTAL CONSTRUCTION JOINTS THROUGH CAST-IN-PLACE CONCRETE FRAMING ARE NOT PERMITTED EXCEPT WHERE SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS.
11. JOINTS ABUTTING EXISTING CONCRETE CONSTRUCTION SHALL BE ROUGH JOINTS UON.
12. CONSTRUCTION JOINTS IN SLAB ON DECK SHALL BE LOCATED AS FOLLOWS:
   a. JOINTS PERPENDICULAR TO THE DECK SPAN SHALL BE LOCATED MIDWAY BETWEEN ADJACENT PARALLEL BEAMS.
   b. JOINTS PERPENDICULAR TO GIRDERS SHALL BE LOCATED NO FARTHER THAN 'S'/2 FROM ONE END OF THE GIRDER WHERE 'S' IS THE DIMENSION BETWEEN ADJACENT BEAMS FRAMING TO THE GIRDER.
13. PROVIDE TEMPLATES TO SET EMBEDDED ITEMS.
14. INSTALLATION OF ELECTRICAL CABLE, CONDUIT, AND PIPING IN OR THROUGH CONCRETE COLUMNS AND WALLS IS PROHIBITED UNLESS APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION. INSTALLATION OF PIPING IN CAST-IN-PLACE CONCRETE IS PROHIBITED UNLESS APPROVED BY STRUCTURAL ENGINEER PRIOR TO INSTALLATION.
15. PROJECTING CORNERS OF BEAMS, WALLS, COLUMNS, ETC. SHALL BE FORMED WITH A 3/4" CHAMFER UON ON ARCHITECTURAL DRAWINGS.
16. SLOPE SLABS TO DRAINS. SEE ARCHITECTURAL AND MEP DRAWINGS FOR DRAIN LOCATIONS AND SLOPE REQUIREMENTS. SLAB THICKNESSES SHOWN ON DRAWINGS ARE MINIMUMS.
17. NO LOADS SHALL BE PLACED ON STRUCTURAL CONCRETE SLABS ON DECK WITHIN 7 DAYS AFTER CONCRETE IS PLACED.
18. AFTER CONCRETE IS PLACED, IN NO CASE SHALL THE SUPERIMPOSED CONSTRUCTION LOADS BE GREATER THAN SPECIFIED DESIGN LIVE LOADS UNLESS THE WORK IS SHORED.
19. CONTRACTOR SHALL SURVEY ALL CONCRETE WORK WITHIN 48 HOURS OF PLACING CONCRETE TO ENSURE PLACEMENT IS IN ACCORDANCE WITH PROJECT REQUIREMENTS.
20. CONCRETE FILL THICKNESS SHOWN ON FRAMING PLANS AND DETAIL SHEETS IS MINIMUM THICKNESS. PROVIDE ALLOWANCES FOR ADDITIONAL CONCRETE FILL REQUIRED TO COMPENSATE FOR BEAM OR DECK DEFLECTIONS AND TO MAINTAIN SURFACE TOLERANCES SPECIFIED.
21. PROVIDE SELF-LEVELING UNDERLAYMENT AT ELEVATED CONCRETE SLABS AND SLABS ON DECK AS REQUIRED TO MEET FLOOR FLATNESS AND LEVELNESS REQUIREMENTS.
22. CORING OF CONCRETE IS NOT PERMITTED UNLESS APPROVED BY THE STRUCTURAL ENGINEER. SUBMIT LOCATIONS OF PROPOSED CONCRETE CORES.
23. REINFORCING STEEL SHALL NOT BE DAMAGED WHEN DRILLING CONCRETE.
24. ADHERE TO ACI 305R AND ACI 306R FOR HOT AND COLD WEATHER CONCRETE CONSTRUCTION.
25. DRYPACK AND GROUT SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 7000 PSI.
26. THE PROPOSED MATERIALS AND MIX DESIGN SHALL BE FULLY DOCUMENTED AND REVIEWED BY THE TESTING AND INSPECTION AGENCY. RESPONSIBILITY FOR OBTAINING THE REQUIRED DESIGN STRENGTH IS THE CONTRACTOR'S. SUBMIT TEST DATA ON EACH PROPOSED MIX FOR REVIEW IN ACCORDANCE WITH THE APPLICABLE CODE. MIX DESIGNS SUBMITTED WITHOUT THE REQUIRED TEST DATA WILL BE RETURNED WITHOUT REVIEW.
27. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, LOCATIONS, AND DETAILS OF ALL ARCHITECTURAL FEATURES IN THE CONCRETE. SEE ARCHITECTURAL DRAWINGS AND PROJECT SPECIFICATIONS FOR REQUIREMENTS FOR ALL CONCRETE FINISHES.

STRUCTURAL PRECAST CONCRETE

2. **GENERAL (DESIGN):**
3. PRECAST CONTRACTOR SHALL ENGAGE AN ENGINEER LICENSED IN THE PROJECT'S JURISDICTION TO DESIGN THE CONNECTIONS AND MEMBERS AND SUBMIT SIGNED AND SEALED DRAWINGS AND STRUCTURAL CALCULATIONS PRIOR TO FABRICATION. THE CERTIFICATION OF DOCUMENTS BY THE PRECAST CONTRACTOR IMPLIES ACCEPTANCE OF DESIGN RESPONSIBILITY.
4. THE PRECAST SYSTEM SHALL BE DESIGNED FOR THE LOADS INDICATED ON THE STRUCTURAL DRAWINGS PLUS THE DEAD LOAD OF THE STRUCTURE AND FOR THE LOADS AND LOAD COMBINATIONS MANDATED IN THE BUILDING CODE. THE DESIGN OF PRECAST CONCRETE SHALL BE IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS AND STANDARDS OF ACI AND PCI.
5. CALCULATIONS AND SHOP DRAWINGS SHALL SHOW A COMPLETE AND RATIONAL LOAD PATH AND SHALL CLEARLY INDICATE THE SERVICE LEVEL REACTIONS IMPOSED ON THE SUPPORTING STRUCTURAL SYSTEM AND/OR FOUNDATION SYSTEM. ALL FIELD ANCHORAGE REQUIREMENTS, INCLUDING FIELD WELDING, SHALL BE SHOWN ON SHOP DRAWINGS. REVIEW OF THE PRECAST SHOP DRAWINGS AND CALCULATIONS BY THE STRUCTURAL ENGINEER WILL BE SOLELY FOR THE PURPOSE OF REVIEWING THE IMPACT OF THESE LOADS UPON THE SUPPORTING STRUCTURAL SYSTEM AND/OR FOUNDATION.
6. PRECAST MEMBER SIZES, OPENINGS, ANTICIPATED CAMBER, REINFORCING STEEL, CONCRETE COMPRESSIVE STRENGTHS, GROUT STRENGTHS, AND CONNECTION DETAILS SHOWN ON THE CONTRACT DOCUMENTS FOR PRECAST CONCRETE FRAMING ARE TO BE CONSIDERED GUIDELINES FOR BIDDING PURPOSES ONLY UON. DETERMINATION OF THE ACTUAL REQUIRED SIZES, OPENINGS, CAMBER, REINFORCING STEEL QUANTITIES AND CONFIGURATIONS, CONCRETE AND GROUT COMPRESSIVE STRENGTHS, AND CONNECTION DETAILS SHALL BE DETERMINED BY THE PRECAST MANUFACTURER'S ENGINEER AND INCLUDED IN SHOP DRAWINGS. IF ANY DIMENSION SHOULD REQUIRE CHANGING, COORDINATION WITH ALL TRADES IS REQUIRED BY CONTRACTOR.
7. PRECAST MANUFACTURER IS RESPONSIBLE FOR DESIGN OF ALL CONNECTION DETAILS BETWEEN PRECAST MEMBERS, CONNECTION DETAILS BETWEEN PRECAST MEMBERS AND SUPPORTING STRUCTURAL MEMBERS AND FOUNDATIONS, AND CONNECTION DETAILS OF ALL ELEMENTS CONNECTING TO THE PRECAST. CONNECTIONS TO THE PRIMARY STRUCTURAL SYSTEM SHALL BE DESIGNED AND DETAILED SO THOSE CONNECTIONS IMPOSE NEITHER ECCENTRIC NOR TORSIONAL LOADS UPON THE SUPPORTING MEMBERS.
8. PRECAST CONCRETE PRESTRESSING STEEL WIRE SHALL BE HIGH STRENGTH STEEL WIRES HAVING A MINIMUM ULTIMATE STRENGTH OF 270 KSI AND CONFORMING TO ASTM A416.
9. PRECAST SHALL BE DESIGNED TO MEET THE FIRE-RATING REQUIREMENTS INDICATED ON THE ARCHITECTURAL DRAWINGS. SEE THE ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
10. **GENERAL (FABRICATION):**
11. THE PRECAST MANUFACTURING PLANT SHALL BE CERTIFIED BY THE PRECAST / PRESTRESSED CONCRETE INSTITUTE (PCI) PRIOR TO THE START OF PRODUCTION.
12. ARCHITECTURAL PRECAST CONCRETE SHALL ONLY BE FURNISHED BY A MANUFACTURER WHO CAN DEMONSTRATE BY REPRESENTATIVE PROJECTS, EQUIPMENT, PERSONNEL, ETC., A PROVEN ABILITY TO PRODUCE AND INSTALL THE PRECAST CONCRETE FOR THIS PROJECT.
13. THE TOPS OF COMPOSITE MEMBERS SHALL BE CAST ROUGH WITH A MINIMUM AMPLITUDE OF 1/4" TO PROVIDE ADEQUATE BOND TO CAST-IN-PLACE CONCRETE. CONTACT SURFACES SHALL BE THOROUGHLY CLEANED PRIOR TO POURING CONCRETE.
14. PRECAST MANUFACTURER SHALL COORDINATE LOCATIONS OF ELECTRICAL CONDUIT, JUNCTION BOXES, SLEEVES, AND OPENINGS IN PRECAST FOR PASSAGE OF CONDUIT, PIPE, AND OTHER UTILITIES WITH THE APPROVAL OF SHOP DRAWINGS. CORING AND DRILLING OF PRECAST IS PROHIBITED UNLESS AUTHORIZED BY MANUFACTURER.
15. PRECAST MANUFACTURER SHALL COORDINATE LOCATIONS OF INSERTS, EMBEDMENTS, AND ANCHORS FOR ATTACHMENT OF EQUIPMENT AND ARCHITECTURAL ELEMENTS.
16. PRECAST MANUFACTURER SHALL PROVIDE EMBEDMENT PLATES FOR CONNECTIONS SHOWN ON THE STRUCTURAL DRAWINGS AS WELL AS PROVIDE FORMED OPENINGS AND CUTOUTS SHOWN ON ARCHITECTURAL AND STRUCTURAL DRAWINGS. EMBED PLATES, OPENINGS, AND CUTOUTS SHALL BE COORDINATED WITH LOCATIONS OF PRESTRESSING WIRE. THE ARCHITECT SHALL BE INFORMED OF ANY CONFLICTS PRIOR TO FABRICATION.
17. PRECAST MANUFACTURER SHALL BE RESPONSIBLE FOR ALL OPENINGS THROUGH PRECAST UNITS LARGER THAN 8"x8" OR Ø'Ø. ALL OTHER OPENINGS LESS THAN 8" SHALL BE CUT BY THE TRADE REQUIRING THEM AND THE LOCATIONS SHALL BE APPROVED BY THE PRECAST SUPPLIER PRIOR TO CUTTING. VERIFY SIZE, LOCATION, AND QUANTITY OF ALL OPENINGS WITH MECHANICAL, ELECTRICAL, AND ARCHITECTURAL PLANS AND ALL CONTRACTORS.
18. EMBEDDED PLATE ASSEMBLIES, WELD PLATES, BOLTS, AND OTHER CONNECTIONS IN PRECAST CONCRETE SHALL BE HOT-DIP GALVANIZED TYPE 304 STAINLESS STEEL UON. REPAIR GALVANIZED SURFACES WITH GALVANIZING REPAIR PAINT.
19. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, LOCATIONS, AND DETAILS OF ALL ARCHITECTURAL FEATURES IN THE PRECAST. SEE ARCHITECTURAL DRAWINGS AND PROJECT SPECIFICATIONS FOR ALL CONCRETE FINISH REQUIREMENTS.
20. ALL PRECAST CONCRETE UNITS SHALL HAVE REACHED THEIR DESIGN STRENGTH PRIOR TO SHIPMENT TO SITE.
21. MANUFACTURER TO CHOOSE BEARING PADS FROM THE FOLLOWING:
   a. RANDOM ORIENTED FIBER, REINFORCED ELASTOMERIC PADS WITH AN ULTIMATE COMPRESSIVE STRENGTH OF 4000 PSI AND SURFACE HARDNESS OF 70 TO 90 SHORE A DUROMETER.
   b. ELASTOMERIC PADS COMPLYING WITH ASTM D4014, PLAIN, VULCANIZED, 100% POLYCHLOROPRENE (NEOPRENE) ELASTOMER WITH SURFACE HARDNESS OF 50 TO 70 SHORE A DUROMETER.
   c. HARDBOARD COMPLYING WITH AHA A135.4, CLASS 1, TEMPERED HARDBOARD STRIPS, SMOOTH ON BOTH SIDES.
22. **GENERAL (INSTALLATION):**
23. INSTALLATION OF PRECAST CONCRETE SHALL BE IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS AND STANDARDS OF ACI AND PCI.
24. CONTRACTOR SHALL PROVIDE ALL NECESSARY INSERTS, ADDITIONAL REINFORCING, BRACING AND LIFTING EQUIPMENT AS REQUIRED TO LIFT AND HANDLE MEMBERS SAFELY AND WITHOUT CRACKING OR DAMAGE.
25. ALL TEMPORARY SHORING PROVIDED BY THE PRECAST SUPPLIER SHALL BE DESIGNED BY THE PRECAST SUPPLIER AND COORDINATED WITH OTHER TRADES.
26. PRECAST UNITS SHALL BE ERECTED SIMULTANEOUSLY ON EACH SIDE OF ALL SUPPORTING BEAMS OR WALLS. THE BEAMS SHALL BE BRACED TO PREVENT ROTATION UNTIL THE PRECAST UNITS ARE FULLY ERECTED.
27. PATCH ALL LOW AREAS OF PRECAST FLOOR AND ROOF AS REQUIRED TO PRODUCE A FLAT SURFACE ACCEPTABLE TO THE ARCHITECT AND OWNER. SUBMIT PROPOSED PATCHING PROCEDURE FOR REVIEW PRIOR TO START OF WORK.
28. **PRECAST CONCRETE HOLLOW CORE SLABS:**
29. HOLLOW CORE SLABS SHALL BE FABRICATED WITH OPEN VOIDS ALONG THE FULL LENGTH OF THE MEMBER EXCEPT WHERE SLABS OR SLAB ZONES ARE IDENTIFIED AS BEING SOLID. WEIGHT OF HOLLOW CORE SLABS SHALL NOT EXCEED:
   a. 12" HOLLOW CORE: 86 PSF
30. ALL TOPPING SLABS TO BE COMPOSITE WITH HOLLOW CORE SLABS UON.
31. THE MINIMUM WIDTH OF CUT HOLLOW CORE SLABS SHALL BE 2 FEET.
32. HOLLOW CORE SLABS ADJACENT TO OPENINGS SHALL BE DESIGNED FOR THE ADDITIONAL LOAD DUE TO THE INTERRUPTED SLABS. ALL HEADERS AT OPENINGS SHALL BE DESIGNED BY THE PRECAST SUPPLIER. THE BOTTOM OF THE HEADER FRAMING MEMBERS SHALL PROTRUDE NO MORE THAN THE THICKNESS OF THE ANGLE BELOW THE BOTTOM OF THE SLAB. RECESS CONNECTION ANGLES BELOW THE TOP OF THE SUPPORTING SLAB AS REQUIRED WHERE CONNECTION ANGLES WOULD OTHERWISE BE EXPOSED TO VIEW.
33. GROUT ALL KEYWAYS BETWEEN HOLLOW CORE SLABS. USE MINIMUM 4000 PSI GROUT STRENGTH.
34. MANUFACTURER SHALL PROVIDE CRITERIA AND GUIDELINES FOR FIELD CORING HOLES THROUGH THE SLAB AND SHALL SHOW THIS CRITERIA ON THE SHOP DRAWINGS.
35. WHERE COMPOSITE CONCRETE TOPPING IS REQUIRED ON SLABS, SUCH TOPPING SHALL BE INSTALLED SO THE TOP OF THE TOPPING IS FINISHED FLAT AND LEVEL AT THE SPECIFIED FINISHED FLOOR ELEVATION UON. TOPPING CONCRETE SHALL BE REDUCED IN THICKNESS AT MIDSPAN TO ACCOMMODATE SLAB CAMBER AND SHALL BE CONSIDERED IN DESIGN.
36. PROVIDE (1)#5 FIELD-INSTALLED BAR IN JOINTS BETWEEN ADJACENT SLABS CLOSEST TO EXTERIOR SLAB EDGES. LAP BARS WITH A CLASS B SPLICE.

MASONRY

1. CMU CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH TMS 402/602 "BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES".
2. MINIMUM 28-DAY COMPRESSIVE STRENGTHS FOR CMU CONSTRUCTION SHALL BE:

DESIGN ASSEMBLY STRENGTH, f'm	2500 PSI
INDIVIDUAL CONCRETE MASONRY UNITS	3250 PSI
GROUT	2500 PSI

3. CMU MATERIALS SHALL CONFORM TO THE FOLLOWING STANDARDS:

CONCRETE MASONRY UNITS	ASTM C90, NORMAL-WEIGHT UON
MORTAR	ASTM C270, TYPE S UON ASTM C270, TYPE N (NON-STRUCTURAL MASONRY)
GROUT	ASTM C476
JOINT REINFORCING	ASTM A82

4. WIRE REINFORCING PER ASTM A82 FOR SINGLE-WYTHE CMU WALLS, CMU CAVITY WALLS, AND MULTI-WYTHE COMPOSITE CMU WALLS SHALL BE HOT-DIP GALVANIZED PER ASTM A153, CORROSION RESISTANT HORIZONTAL LADDER-TYPE JOINT REINFORCING WITH THE FOLLOWING GAUGE AND VERTICAL SPACING:

RUNNING BOND	9GA @ 8" OC (ALL WIDTHS)
BELOW GRADE WALLS	9GA @ 8" OC
OTHER THAN RUNNING BOND	9GA @ 8" OC (6"-8" WIDTHS) 9GA @ 8" OC (10"-16" WIDTHS)

5. ALL LOAD BEARING CMU WALLS TO HAVE FULL MORTAR BED, HEAD, AND COLLAR JOINTS.
6. PROVIDE MINIMUM 1" GROUT BETWEEN MAIN REINFORCING AND/OR BOLTS AND CMU UNIT FACE. VERTICAL REINFORCEMENT SHALL BE CENTERED IN WALL UON. VERTICAL REINFORCING BARS SHALL BE SECURELY HELD IN POSITION BY WIRE TIES OR OTHER APPROVED MEANS TO ENSURE DESIGN LOCATION AND LAP. PLACE BARS AND LAP PRIOR TO GROUTING.
7. HORIZONTAL BOND BEAM AND VERTICAL REINFORCING SHALL BE CONTINUOUS UON.
8. CELLS SHALL BE IN VERTICAL ALIGNMENT. DOWEL SIZE AND LOCATION IN FOOTINGS SHALL BE SET TO ALIGN WITH VERTICAL REINFORCING STEEL WITHIN 6" TOLERANCE. VERTICAL REINFORCEMENT TO RUN FULL HEIGHT OF WALL UON.
9. GROUT CELLS SOLID IN ALL WALLS UON.
10. GROUT IN 5'-4" MAXIMUM LIFTS.
11. LIFTS OF GROUT SHALL BE KEYED 1 1/2" INTO THE PREVIOUS COURSE BELOW.
12. HORIZONTAL BAR REINFORCEMENT SHALL BE FULLY EMBEDDED IN GROUT IN AN UNINTERRUPTED POUR.
13. ALL BOND BEAMS TO HAVE A MINIMUM 8" DEPTH. PROVIDE TALLER BOND BEAMS AS NEEDED FOR COURSING OR TO AVOID INTERFERENCE BETWEEN REINFORCING STEEL AND POST-INSTALLED ANCHORS. CUT AND STEP BOND BEAM AS REQUIRED.
14. PROVIDE HORIZONTAL TIES WHERE CMU ABUTS CONCRETE.
15. COORDINATE ANY UNIDENTIFIED PIPE OR DUCT PASSING THROUGH STRUCTURAL CMU WALLS WITH PRIOR TYPICAL DETAILS UON. ADDITIONAL LINTELS MAY BE REQUIRED. COORDINATE WITH STRUCTURAL ENGINEER FOR REQUIRED LINTEL SIZE BEFORE CONSTRUCTION OF CMU WALL.
16. PIPE AND CONDUIT SHALL NOT BE PERMITTED IN CELLS WITH VERTICAL REINFORCEMENT. CONDUIT TO BE LOCATED TO AVOID ALL HORIZONTAL REINFORCEMENT. NO ALUMINUM CONDUITS PERMITTED.
17. SEE ARCHITECTURAL DRAWINGS FOR SURFACE AND HEIGHT OF UNITS, LAYING PATTERN, AND JOINT TYPE. ALL BLOCK SHALL BE LAID IN RUNNING BOND UON.
18. SEE ARCHITECTURAL DRAWINGS FOR OTHER WALL ASSEMBLY COMPONENTS.
19. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND DIMENSIONS OF ALL NON-LOAD BEARING CMU WALLS.
20. MINIMUM HORIZONTAL REINFORCING SHALL BE (2)#5 BARS IN CENTER OF MINIMUM 16" DEEP CONTINUOUS GROUTED BOND BEAM AT ELEVATED FLOOR, INTERMEDIATE STAIR LANDINGS, AND ROOF LINES AND (1)#5 BAR IN CENTER OF 8" DEEP CONTINUOUS GROUTED BOND BEAM AT TOP OF PARAPET OR FREE-STANDING WALL AND AT INTERVALS NOT TO EXCEED 48" UON. PLACE BARS AT ELEVATED FLOOR AND ROOF LINES CONTINUOUS THROUGH CONTROL JOINTS.

STEEL

1. STRUCTURAL STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "DETAILING FOR STEEL CONSTRUCTION" AND FABRICATED AND ERECTED IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".

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PROJECT NO: 24102
DATE: 08/26/2026
SHEET SET: BID DOCUMENTS
SHEET NAME: GENERAL NOTES
SHEET: S0.01

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2. STRUCTURAL STEEL SHALL CONFORM TO ASTM STANDARDS AS NOTED BELOW:

WIDE FLANGE AND WT SHAPES	ASTM A992	Fy=50 KSI
CHANNEL SHAPES	ASTM A992	Fy=50 KSI
ANGLE SHAPES	ASTM A572	Fy=50 KSI
HSS SECTIONS, SQ/RECT	ASTM A500, GR C	Fy=50 KSI
PLATES	ASTM A572	Fy=50 KSI
ANCHOR RODS	ASTM F1554, GR 55	Fy=55 KSI
HIGH STRENGTH BOLTS	ASTM F3125, GR A325	Fu=120 KSI
HIGH STRENGTH TWIST-OFF BOLTS	ASTM F3125, GR F1852	Fu=120 KSI
HEAVY HEX NUTS	ASTM A563	
WASHERS FOR HIGH STRENGTH BOLTS	ASTM F436	
HEADED STUD ANCHORS (HSA)	ASTM A108, TYPE B	
WELDING	AWS D1.1, 70KSI FILLER METAL	

3. HIGH STRENGTH BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS". SEE DETAILS FOR BOLT SIZE AND MATERIAL ASTM DESIGNATION.
4. ALL BOLTED CONNECTIONS SHALL BE GRADE A325N BEARING TYPE BOLTS UON. ALL BOLTS SHALL BE INSTALLED TO A MINIMUM SNUG TIGHT CONDITION UON.
5. FULLY TENSIONED HIGH STRENGTH BOLTS AND SLIP CRITICAL HIGH STRENGTH BOLTS SHALL USE TENSION-CONTROL "TWIST-OFF" BOLTS OR BE INSTALLED USING THE TURN OF THE NUT METHOD.
6. DELEGATED STRUCTURAL STEEL CONNECTIONS:
   a. ALL STRUCTURAL STEEL CONNECTIONS (OTHER THAN THOSE CONNECTIONS IDENTIFIED AS "FULLY DESIGNED") AND MEMBER REINFORCEMENT AT THE CONNECTIONS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WORKING FOR THE FABRICATOR IN ACCORDANCE WITH AISC 303, OPTION 3. THAT ENGINEER SHALL BE LICENSED IN THE JURISDICTION IN WHICH THE PROJECT IS LOCATED.
   b. CONNECTIONS AND MEMBER REINFORCEMENT AT THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE REACTIONS SPECIFIED OR INDICATED ON THE DRAWINGS.
   c. WHERE SPECIFIC CONNECTION TYPES, DETAILS, CONFIGURATIONS, OR CONNECTION DESIGN LIMITATIONS ARE INDICATED, THE CONNECTIONS SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH THOSE REQUIREMENTS. WHERE SPECIFIC SIZES, QUANTITIES AND DIMENSIONS OF BOLTS, WELDS, AND PLATES ARE INDICATED, THOSE ARE MINIMUM PERMITTED SIZES, QUANTITIES, AND DIMENSIONS. THE CONNECTION STRENGTH OF ALL CONNECTIONS SHALL BE DETERMINED BY THE FABRICATOR'S CONNECTION DESIGN ENGINEER, AND THE CONNECTION DETAIL SHALL BE MODIFIED IF REQUIRED TO PROVIDE THE REQUIRED STRENGTH.
   d. CONNECTION DESIGN RESPONSIBILITY SHALL INCLUDE CALCULATION OF MEMBER STRENGTH AT CONNECTIONS CONSIDERING THE EFFECTS OF COPES, BOLT HOLES, CONNECTION ECCENTRICITY, AND CONNECTION GEOMETRY AND SHALL CONSIDER ALL LIMIT STATES INCLUDING BUT NOT LIMITED TO REVIEW OF GROSS SHEAR, NET SHEAR, BLOCK SHEAR, WEB TEAR-OUT, BEARING, FLEXURAL STRENGTH, LOCAL BUCKLING, TENSILE STRENGTH THROUGH BOTH THE NET AND GROSS SECTIONS, COMPRESSIVE STRENGTH, AND DUCTILITY. DESIGN OF CONNECTIONS SHALL BE IN ACCORDANCE WITH RECOGNIZED PUBLISHED METHODS SUCH AS THOSE PUBLISHED IN THE AISC "ENGINEERING JOURNAL.", THE AISC 15TH EDITION STEEL CONSTRUCTION MANUAL, AND THE AISC STEEL CONSTRUCTION MANUAL DESIGN EXAMPLES. CONNECTION DESIGN SHALL CONSIDER TRANSFER FORCES THROUGH CONNECTED AND CONNECTING MEMBERS. CONNECTION DESIGN RESPONSIBILITY SHALL INCLUDE ANALYSIS AND DESIGN OF PLATES, BRACKETS, STRUTS, STIFFENER PLATES, GUSSET PLATES, AND OTHER ELEMENTS TO TRANSFER FORCES INTO AND BETWEEN MEMBERS. CALCULATIONS SHALL SHOW FULL DETAILED CODE EQUATIONS AND METHODOLOGY FOR A REPRESENTATIVE SAMPLE OF EACH CONNECTION TYPE.
   e. AT ENGINEER OF RECORD'S REQUEST, MANUAL CALCULATIONS SHALL BE SUBMITTED FOR EACH CONNECTION TYPE TO VERIFY THAT CONNECTIONS DESIGNED USING COMPUTER SOFTWARE CONSIDER ALL LIMIT STATES AND PRODUCE RESULTS IDENTICAL TO THE MANUAL CALCULATIONS.
   f. ALL BOLTED BEAM SHEAR CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS. ALL BEAM SHEAR CONNECTIONS SHALL BE DETAILED SO THAT THE LENGTH OF THE CONNECTION IS GREATER THAN OR EQUAL TO 50% OF THE "T" DIMENSION OF THE SUPPORTED MEMBER.
   g. BEAM SHEAR CONNECTIONS SHALL BE DESIGNED AS SIMPLE SHEAR CONNECTIONS PER AISC 360 PART 10 TO SUPPORT LRFD REACTIONS, EXCEPT WHERE INDICATED AS FULLY DESIGNED ON THE CONTRACT DOCUMENTS. CONNECTIONS SHALL BE DESIGNED TO SUPPORT A MINIMUM OF15 KIPS, WHERE LOADS ARE NOT PROVIDED ON CONTRACT DOCUMENTS. CONNECTIONS SHALL SUPPORT 60% OF THE TOTAL UNIFORM LOAD CAPACITY FOR NON-COMPOSITE BEAMS. FOR COMPOSITE BEAMS, CONNECTIONS SHALL SUPPORT 80% OF THE TOTAL UNIFORM LOAD CAPACITY.
   h. MOMENT CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE LRFD MOMENTS INDICATED ON THE DRAWINGS. WHERE NO MOMENT REACTION IS INDICATED, THE CONNECTION SHALL BE DESIGNED TO SUPPORT 75% OF THE FULL PLASTIC MOMENT STRENGTH OF THE MEMBER. MOMENT CONNECTIONS SHALL BE DESIGNED AS FULLY RESTRAINED MOMENT CONNECTIONS.
7. WELD LENGTHS INDICATED ON THE DRAWINGS ARE THE NET EFFECTIVE LENGTH REQUIRED. WHERE WELD LENGTH IS NOT SPECIFIED, PROVIDE WELD ALONG ENTIRE INTERSECTION OF THE JOINED PARTS. WHERE FILLET WELD SYMBOL IS GIVEN WITHOUT INDICATION OF SIZE, USE MINIMUM WELD SIZE AS SPECIFIED IN AISC 360, TABLE J2.4.
8. SHOP CONNECTIONS SHALL BE WELDED UON. WELDS INDICATED WITH A SHOP WELD SYMBOL MAY BE MADE IN THE FIELD WITH THE APPROVAL OF THE STRUCTURAL ENGINEER. LOCATIONS OF ALL FIELD WELDS SHALL BE CLEARLY SHOWN ON THE SHOP DRAWINGS.
9. ALL WELDING OF STRUCTURAL STEEL SHALL BE PERFORMED BY CERTIFIED WELDERS WITH EXPERIENCE AND CERTIFICATION IN THE TYPES OF WELDING INDICATED. WELDERS SHALL HAVE BEEN RECENTLY QUALIFIED AS PRESCRIBED IN "QUALIFICATION PROCEDURES" OF THE AMERICAN WELDING SOCIETY (AWS).
10. HEADED STUD ANCHORS (HSA): SHALL BE INSTALLED IN ACCORDANCE WITH AWS D1.1 AND SHALL BE AUTOMATICALLY END WELDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS IN SUCH A MANNER AS TO PROVIDE COMPLETE FUSION BETWEEN THE END OF THE HSA AND THE STEEL SHAPE. THERE SHOULD BE NO POROSITY OR EVIDENCE OF LACK OF FUSION BETWEEN THE WELDED END OF THE HSA AND THE STEEL SHAPE. THE HSA SHALL DECREASE IN LENGTH DURING WELDING APPROXIMATELY 1/8" FOR 5/8"Ø AND SMALLER AND 3/16" FOR LARGER THAN 5/8"Ø.
11. MINIMUM HORIZONTAL CONCRETE COVER FOR HSA TO BE 2".
12. BEAMS SHALL BE CAMBERED UPWARD WHERE SHOWN ON THE DRAWINGS. WHERE NO UPWARD CAMBER IS INDICATED, ANY MILL CAMBER SHALL BE DETAILED UPWARD IN THE BEAMS.
13. SPLICING OF STEEL MEMBERS WHERE NOT DETAILED ON THE DRAWINGS IS PROHIBITED WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL ENGINEER AS TO LOCATION, TYPE OF SPLICE, AND CONNECTION TO BE MADE.
14. PROVIDE ONE SHOP COAT OF PAINT ON ALL STRUCTURAL STEEL NOT COVERED WITH CONCRETE, FIREPROOFING, MASONRY, OR AT CONTACT SURFACES AT HIGH STRENGTH BOLTS.
15. ALL STEEL EXPOSED TO WEATHER OR AS NOTED ON PLAN SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 G60. ABRADED AREAS TO BE TOUCHED UP WITH COLD GALVANIZING COMPOUND IN ACCORDANCE WITH ASTM A780.
16. ALL GALVANIZED HOLLOW SECTIONS SHALL HAVE WELDED CAP PLATES TO SEAL EXPOSED ENDS.
17. CUTS, HOLES, OPENINGS, ETC. REQUIRED IN STRUCTURAL STEEL MEMBERS FOR THE WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS. BURNING OR TORCHING OF HOLES, CUTS, AND OTHER FIELD MODIFICATIONS SHALL NOT BE ALLOWED, EXCEPT BY WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER.
18. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, ETC. FOR MISCELLANEOUS STEEL NOT DETAILED SPECIFICALLY ON THE STRUCTURAL DRAWINGS.
19. GROUT FOR BASE AND BEARING PLATES SHALL BE A NON-SHRINK, NON-METALLIC PRODUCT. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS SHALL BE 7000 PSI. INSTALL GROUT PRIOR TO APPLYING SIGNIFICANT LOADING TO MEMBER.
20. THE STRUCTURAL STEEL FABRICATOR SHALL FURNISH SHOP DRAWINGS OF ALL STRUCTURAL STEEL FOR REVIEW AND APPROVAL BEFORE FABRICATION.

STEEL JOISTS

1. DESIGN, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE STEEL JOIST INSTITUTE (SJI) SPECIFICATION BY A MEMBER OF THE SJI, APPROVED FOR THE TYPE OF JOIST BEING USED.
2. ATTACH STEEL JOIST TO SUPPORT AS FOLLOWS:

	DETAILS WITH WELD INFORMATION		DETAILS WITH BOLT INFORMATION		MINIMUM END BEARING (IN)	
JOIST TYPE/SERIES	FILLET WELD SIZE	WELD LENGTH (IN)	BOLT DIAMETER (IN)	BOLT MATERIAL	STEEL	MASONRY
K	1/8	2 1/2	1/2	A307	2 1/2	4
LH/DLH 02-06	3/16	2 1/2	3/4	A307	2 1/2	6
LH/DLH 07-17	1/4	2 1/2	3/4	A307	4	6
LH/DLH 18-25	1/4	4	3/4	A325	6	6
JOIST GIRDER	1/4	4	3/4	A325	6	6

   WHERE WELDS OR BOLTS ARE INDICATED, WELD/BOLT TO BE INSTALLED ON BOTH SIDES OF JOIST SEAT UON.
3. DESIGN JOIST SEAT FOR 1500 LBS (1.0 WL) ROLLOVER LOAD FOR K-SERIES JOISTS ONLY.
4. ALL ROOF JOISTS SHALL BE DESIGNED FOR A 15 PSF NET WIND UPLIFT (LRFD).
5. PROVIDE BRIDGING PER SJI SPECIFICATIONS. DESIGN AND PROVIDE UPLIFT BRIDGING TO WITHSTAND A NET UPLIFT PRESSURE AS INDICATED ABOVE. WHERE BRIDGING INTERFERES WITH MECHANICAL OR OTHER TRADE INSTALLATIONS, THE JOIST MANUFACTURER SHALL PROVIDE DIRECTION FOR REMOVAL AND REPLACEMENT OF ANY BRIDGING.
6. HANGING OF MISCELLANEOUS ITEMS IS NOT PERMITTED FROM BRIDGING / BRACING.
7. ALL JOIST HEADERS AND ACCESSORIES SHALL BE DESIGNED AND FURNISHED BY THE JOIST FABRICATOR.
8. STEEL JOISTS SHALL BE TOP CHORD BEARING UON.
9. THE JOIST FABRICATOR SHALL FURNISH SHOP DRAWINGS OF ALL BAR JOIST MATERIAL AND ACCESSORIES FOR REVIEW AND APPROVAL BEFORE FABRICATION.
10. PROVIDE SLOPED JOIST SEATS AS REQUIRED TO MEET ROOF SLOPE REQUIREMENTS. COORDINATE WITH ARCHITECTURAL DRAWINGS.

POST-INSTALLED ANCHORS

1. BASIS OF DESIGN ANCHORS:

INSTALLATION CONDITION	ANCHOR TYPE
EXPANSION ANCHORS INTO CONCRETE	HILTI KWIK BOLT TZ2 (ESR-4266)
SCREW ANCHORS > 1/4"Ø INTO CONCRETE	HILTI KWIK HUS-EZ (ESR-3027)
ADHESIVE ANCHORS INTO CONCRETE	HILTI SAFE-SET SYSTEM w/ HIT-HY 200 V3 AND HIT-Z ROD (ESR-4868) or HILTI SAFE-SET SYSTEM w/ HIT-HY 200 V3 AND HAS-E THREADED ROD (ESR-4868) or HILTI SAFE-SET SYSTEM w/ HIT-RE 500 V3 AND HAS-E THREADED ROD (ESR-3814) FOR ALL ADHESIVE ANCHORS, HOLES SHALL BE HAMMER DRILLED AND HOLES MAY BE DRY OR WATER SATURATED.
EXPANSION ANCHORS INTO GROUTED CMU	HILTI KWIK TZ2 (ESR-4561)
SCREW ANCHORS > 1/4"Ø INTO GROUTED CMU	HILTI KWIK HUS-EZ (ESR-3056)
SCREW ANCHORS = 1/4"Ø INTO CONCRETE OR GROUTED CMU	HILTI KWIK-CON II+
ADHESIVE ANCHORS IN GROUTED CMU OR SOLID BRICK	HILTI HIT-HY 270 SYSTEM w/ HAS-E THREADED ROD (ESR-4143)
ADHESIVE ANCHORS INTO HOLLOW CMU, BRICK OR MULTI-WYTHE BRICK WALLS	HILTI HIT-HY 270 SYSTEM w/ HAS-E THREADED ROD AND APPROPRIATE SCREEN TUBE (ESR-4144)
ADHESIVE DOWELING FOR ANCHORING REINFORCING BARS INTO (E) CONCRETE	HILTI SAFE-SET SYSTEM w/ HIT-HY 200 V3 ADHESIVE (ESR-4868) or HILTI SAFE-SET SYSTEM w/ HIT-RE 500 V3 ADHESIVE (ESR-3814)
POWDER-ACTUATED FASTENERS (PAF's) IN CONCRETE	HILTI X-U FASTENERS (ESR-2269)

2. ALTERNATIVE ANCHORS MAY BE USED IF APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. THE CONTRACTOR SHALL SUBMIT CALCULATIONS SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE PROJECT'S JURISDICTION VERIFYING PROPOSED ALTERNATIVE ANCHORS WILL PROVIDE THE SAME OR GREATER LOAD-CARRYING CAPACITY AS THE SPECIFIED ANCHORS. THE CONTRACTOR SHALL SUBMIT EVALUATION REPORTS. EACH ANCHOR CONFIGURATION SHALL BE EVALUATED AND COMPARED TO THE SPECIFIED ANCHOR.
3. CRACKED CONCRETE IS ASSUMED FOR ALL ANCHORAGE DESIGN CONDITIONS UNLESS IT CAN BE DEMONSTRATED THROUGH ENGINEERING ANALYSIS THAT THE CONCRETE REMAINS UNCRACKED DURING THE GOVERNING ULTIMATE LOAD STATE.
4. POST-INSTALLED ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
5. THE CONTRACTOR SHALL ARRANGE FOR AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR EACH SPECIFIED ANCHOR TYPE. THE STRUCTURAL ENGINEER SHALL RECEIVE DOCUMENTATION VERIFYING ALL OF THE CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS HAVE BEEN TRAINED PRIOR TO COMMENCEMENT OF INSTALLING ANCHORS.
6. INSTALLATION OF ADHESIVE ANCHORS SHALL BE PERFORMED BY PERSONNEL CERTIFIED BY AN APPROVED CERTIFICATION PROGRAM. CERTIFICATION SHALL INCLUDE WRITTEN AND PERFORMANCE TESTS IN ACCORDANCE WITH THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM OR EQUIVALENT. THE ACCEPTABILITY OF CERTIFICATIONS OTHER THAN THE ACI/CRSI ADHESIVE INSTALLER CERTIFICATION WILL BE DETERMINED BY THE STRUCTURAL ENGINEER.
7. CONCRETE SHALL HAVE ACHIEVED DESIGN STRENGTH PRIOR TO INSTALLING POST-INSTALLED ANCHORS. ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE THAT HAS CURED FOR A MINIMUM OF 21 DAYS.
8. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ANCHORS AND PROXIMITY OF ANCHORS TO EDGES OF CONCRETE OR MASONRY. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
9. POST-INSTALLED ANCHORS AND DOWELS SHALL BE INSTALLED IN A MANNER THAT DOES NOT DAMAGE REINFORCING STEEL, CONDUIT OR OTHER EMBEDDED ITEMS. REINFORCING STEEL SHALL BE LOCATED BY NON-DESTRUCTIVE MEANS PRIOR TO DRILLING HOLES. PLATES AND BRACKETS THROUGH WHICH ANCHORS WILL BE INSTALLED SHALL NOT BE FABRICATED UNTIL AFTER REINFORCING STEEL IS LOCATED AND ANCHOR LOCATIONS ARE ADJUSTED. CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER TO OBTAIN ALTERNATIVE ANCHOR LAYOUT WHERE ANCHORS MUST BE RELOCATED TO AVOID INTERFERENCE WITH REINFORCING STEEL.
10. ADHESIVE ANCHORING SYSTEMS ARE PERMITTED TO BE USED FOR INSTALLATION OF REINFORCING STEEL INTO EXISTING CONCRETE ONLY WHERE SPECIFICALLY INDICATED IN THE CONTRACT DOCUMENTS OR WITH APPROVAL FROM THE STRUCTURAL ENGINEER. LOCATIONS WHERE REINFORCING STEEL WAS INCORRECTLY PLACED OR MISSED SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
11. WHERE POST-INSTALLED MECHANICAL ANCHOR EMBEDMENT DEPTHS ARE SPECIFIED, THOSE DEPTHS ARE THE REQUIRED MINIMUM NOMINAL EMBEDMENT DEPTHS. WHERE MECHANICAL ANCHOR EMBEDMENT DEPTHS ARE NOT INDICATED, THE ANCHORS SHALL BE INSTALLED TO THE MAXIMUM EMBEDMENT DEPTH NOTED IN THE MANUFACTURER'S PRODUCT TECHNICAL GUIDE.
12. ADHESIVE ANCHORS SHALL BE INSTALLED WITH A MINIMUM 6" EMBEDMENT DEPTH UON.

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PROJECT #25006766.00

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

MICHAEL P. MERRON
21018
08-26-2026
IOWA
LICENSED PROFESSIONAL ENGINEER

CITY OF WATERLOO
NEW CITY HALL/ POLICE HEADQUARS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
08/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
GENERAL NOTES

SHEET:
S0.02

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GENERAL

1. THE STRUCTURAL ENGINEER DOES NOT PROVIDE INSPECTIONS OF CONSTRUCTION. STRUCTURAL ENGINEER MAY MAKE PERIODIC OBSERVATIONS OF THE CONSTRUCTION. SUCH OBSERVATIONS SHALL NOT REPLACE REQUIRED INSPECTIONS BY THE GOVERNING AUTHORITIES OR SERVE AS "SPECIAL INSPECTIONS" AS MAY BE REQUIRED BY CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.
2. SEE ARCHITECTURAL, CIVIL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS OR SPECIFICATIONS FOR TESTING AND INSPECTION REQUIREMENTS OF NON-STRUCTURAL COMPONENTS.
3. DUTIES OF THE INSPECTION AGENCY PER IBC CHAPTER 17:
   a. SUBMIT A PROPOSED TESTING AND INSPECTION PROGRAM TO THE OWNER, THE ARCHITECT AND THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL AT LEAST TWO WEEKS PRIOR TO COMMENCEMENT OF WORK
   b. PERFORM ALL TESTING AND INSPECTION REQUIRED PER APPROVED TESTING AND INSPECTION PROGRAM.
   c. FURNISH INSPECTION REPORT TO THE BUILDING OFFICIAL, THE OWNER, THE ARCHITECT, STRUCTURAL ENGINEER AND THE GENERAL CONTRACTOR. THE REPORTS SHALL BE COMPLETED AND FURNISHED WITHIN 48 HOURS OF INSPECTED WORK.
   d. SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE SPECIAL INSPECTION AGENCY'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
4. SPECIAL INSPECTIONS AND TESTS ARE REQUIRED FOR MATERIALS AND SYSTEMS REQUIRED TO BE INSTALLED IN ACCORDANCE WITH ADDITIONAL MANUFACTURER'S INSTRUCTIONS THAT PRESCRIBE REQUIREMENTS NOT CONTAINED IN CHAPTER 17 OF THE IBC OR IN STANDARDS REFERENCED BY THE IBC. THESE ITEMS INCLUDE:
   a. POST-INSTALLED ANCHORS - INSPECTION
5. THE FOLLOWING WORK SHALL BE INSPECTED BY THE SPECIAL INSPECTOR UNLESS SPECIFICALLY WAIVED BY THE BUILDING OFFICIAL.

CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC	MATERIAL STD REFERENCE	IBC REFERENCE
INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT	-	X	ACI 318: CH 20, 25.2, 25.3, 26.6.1-26.6.3	-
REINFORCING BAR WELDING:			AWS D1.4 ACI 318: 26.6.4	
a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706	-	X	-	-
b. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"	-	X	-	-
c. INSPECTS ALL OTHER WELDS	X	-	-	-
INSPECT ANCHORS CAST IN CONCRETE	-	X	ACI 318: 17.8.2	-
INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS:				
a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	X	-	ACI 318: 17.8.2.4	-
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED ABOVE	-	X	ACI 318: 17.8.2	-
VERIFY USE OF REQUIRED DESIGN MIX	-	X	ACI 318: CH 19, 26.4.3, 26.4.4	1904.1, 1904.2
PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	X	-	ASTM C172, ASTM C31, ACI 318: 26.5, 26.12	-
INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X	-	ACI 318: 26.5	-
VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	-	X	ACI 318: 26.5.3-26.5.5	-
INSPECT PRESTRESSED CONCRETE FOR:				
INSPECT ERECTION OF PRECAST CONCRETE MEMBERS	-	X	ACI 318: 26.9	-
c. COMPLETION OF CONNECTIONS IN THE FIELD	X	-	-	-
INSPECT INSTALLATION TOLERANCES OF PRECAST CONCRETE DIAPHRAGM CONNECTIONS FOR COMPLIANCE WITH ACI 550.5	-	X	ACI 318: 26.13.1.3	
INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	-	X	ACI 318: 26.11.1.2(b)	-

MASONRY CONSTRUCTION - LEVEL 3

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC	TMS 402	TMS 602
PRIOR TO CONSTRUCTION:				
a. VERIFICATION OF COMPLIANCE OF SUBMITTALS		x-	-	ART. 1.5
b. VERIFICATION OF f'm		x	-	ART. 1.4 B
AS CONSTRUCTION BEGINS, VERIFY THE FOLLOWING ARE IN COMPLIANCE:				
a. PROPORTIONS OF SITE-PREPARED MORTAR	-	X	-	ART. 2.1, 2.6 A & 2.6 C
c. GRADE, TYPE, AND SIZE OF REINFORCEMENT, CONNECTORS, ANCHOR BOLTS, AND PRESTRESSING TENDONS AND ANCHORAGES	-	X	-	ART. 3.4 & 3.6 A
PRIOR TO GROUTING, VERIFY THE FOLLOWING ARE IN COMPLIANCE:				
a. GROUT SPACE		-X	-	ART. 3.2 D & 3.2 F
c. PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS		-X	SEC. 6.1, 6.3.1, 6.3.6 & 6.3.7	ART. 3.2 E & 3.4
DURING CONSTRUCTION:		X		
a. VERIFICATION OF SLUMP FLOW AND VISUAL STABILITY INDEX (VSI) WHEN SELF-CONSOLIDATING GROUT IS DELIVERED TO THE PROJECT SITE		XX-	-	ART. 1.5 & 1.6.3
b. VERIFICATION OF f'm FOR EVERY 5,000 SQ. FEET		-X	-	ART. 1.4 B
c. VERIFICATION OF PROPORTIONS OF MATERIAL AS DELIVERED TO THE PROJECT SITE FOR PREMIXED OR PREBLENDED MORTAR, PRESTRESSING GROUT, AND GROUT OTHER THAT SELF-CONSOLIDATING GROUT		-X	-	ART. 1.4 B
d. MATERIALS AND PROCEDURES WITH THE APPROVED SUBMITTALS	-	X	-	ART. 1.5
e. PLACEMENT OF MASONRY UNITS AND MORTAR JOINT CONSTRUCTION	-	X	-	ART. 3.3 B
f. SIZE AND LOCATION OF STRUCTURAL MEMBERS	-	X	-	ART. 3.3 F
g. TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	-	X	SEC. 1.2.1(e), 6.2.1 & 6.3.1	-
h. WELDING OF REINFORCEMENT	X	-	SEC. 6.1.6.1.2	-
i. PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F) OR HOT WEATHER (TEMPERATURE ABOVE 90° F)	-	X	-	ART. 1.8 C & 1.8 D
OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS		-X	-	ART. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3 & 1.4 B.4

STRUCTURAL STEEL - INSPECTION TASKS AFTER BOLTING (AS A MINIMUM)

VERIFICATION AND INSPECTION TASK	QC	QA	AISC 360	RCSC SECTIONS
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P	P	TABLE N5.6-3	-

STRUCTURAL STEEL - INSPECTION TASKS PRIOR TO WELDING (AS A MINIMUM)

VERIFICATION AND INSPECTION TASK	QC	QA	AISC 360	AWS D1.1 CLAUSES
WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS	P	O	TABLE N5.4-1	-
WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	P	P	TABLE N5.4-1	6.3
MANUFACTURER CERTIFICATES FOR WELDING CONSUMABLES AVAILABLE	P	P	TABLE N5.4-1	6.2
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O	TABLE N5.4-1	6.2
WELDER IDENTIFICATION	O	O	TABLE N5.4-1	6.4 (WELDER QUALIFICATION)
FIT-UP OF FILLET WELDS	O	O	TABLE N5.4-1	
a. DIMENSIONS (ALIGNMENT, GAPS AT ROOT)	O	O	TABLE N5.4-1	5.21.1
b. CLEANLINESS (CONDITION OF STEEL SURFACES)	O	O	TABLE N5.4-1	5.14
c. TACKING (TACK WELD QUALITY AND LOCATION)	O	O	TABLE N5.4-1	5.17
CHECK WELDING EQUIPMENT	O	-	TABLE N5.4-1	6.2, 5.10

2. O=OBSERVE AND P=PERFORM

STRUCTURAL STEEL - INSPECTION TASKS AFTER WELDING (AS A MINIMUM)

VERIFICATION AND INSPECTION TASK	QC	QA	AISC 360	AWS D1.1 CLAUSES
WELDS CLEANED	O	O	TABLE N5.4-3	5.29.1
SIZE, LENGTH, AND LOCATION OF WELDS	P	P	TABLE N5.4-3	6.5.1
WELDS MEET VISUAL ACCEPTANCE CRITERIA			TABLE N5.4-3	6.5.3
a. CRACK PROHIBITION	P	P	TABLE N5.4-3	TABLE 6.1(1)
b. WELD/BASE-METAL FUSION	P	P	TABLE N5.4-3	TABLE 6.1(2)
c. CRATER CROSS-SECTION	P	P	TABLE N5.4-3	TABLE 6.1(3)
d. WELD PROFILES	P	P	TABLE N5.4-3	TABLE 6.1(4), 5.24
e. WELD SIZE	P	P	TABLE N5.4-3	TABLE 6.1(6)
f. UNDERCUT	P	P	TABLE N5.4-3	TABLE 6.1(7)
g. POROSITY	P	P	TABLE N5.4-3	TABLE 6.1(8)
ARC STRIKES	P	P	TABLE N5.4-3	5.28
k-AREA[1]	P	P	TABLE N5.4-3	-
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P	TABLE N5.4-3	5.9, 5.30
REPAIR ACTIVITIES	P	P	TABLE N5.4-3	6.5.3, 5.25
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P	TABLE N5.4-3	6.5.4, 6.5.5
NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE EOR	O	O	TABLE N5.4-3	-

2. O=OBSERVE AND P=PERFORM
3. [1] WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE k-AREA, VISUALLY INSPECT THE WEB k-AREA FOR CRACKS WITHIN 3" OF THE WELD. THE VISUAL INSPECTION SHALL BE PERFORMED NO SOONER THAN 48 HOURS FOLLOWING COMPLETION OF THE WELDING.
   [2] AFTER ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SHAPES ARE WELDED, VISUALLY INSPECT THE WELD ACCESS HOLE FOR CRACKS.

OPEN WEB STEEL JOISTS AND JOIST GIRDERS

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC	MATERIAL STD REFERENCE
INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS:			
a. END CONNECTIONS - WELDING AND BOLTED	-	X	SJI SPEC. LISTED IN SECTION 2207.1
b. STANDARD HORIZONTAL AND DIAGONAL BRIDGING	-	X	SJI SPEC. LISTED IN SECTION 2207.1
c. HORIZONTAL AND DIAGONAL BRIDGING THAT DIFFERS FROM THE SJI SPECIFICATIONS LISTED IN SECTION 2207.1	-	X	-

SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	-	X
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	-	X
PERFORM CLASSIFICATIONS AND TESTING OF COMPACTED FILL MATERIAL	-	X
DURING FILL PLACEMENT, VERIFY USE OF PROPER MATERIALS AND PROCEDURES IN ACCORDANCE WITH THE PROVISIONS OF THE APPROVED GEOTECHNICAL REPORT. VERIFY DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-
PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	-	X

CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
INSPECT DRILLING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT	X	-
VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM ELEMENT DIAMETERS, BELL DIAMETERS (IF APPLICABLE), LENGTHS, EMBEDMENT INTO BEDROCK (IF APPLICABLE), AND ADEQUATE END-BEARING STRATA CAPACITY. RECORD CONCRETE OR GROUT VOLUMES	X	-
FOR CONCRETE ELEMENTS, PERFORM TESTS AND ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.3	-	-

STORM SHELTER INSPECTION AND STRUCTURAL OBSERVATIONS

1. ICC500-2021, 106.1.1 PEER REVIEW: A PIER REVIEW SHALL BE CONDUCTED BY AN INDEPENDENT REGISTERED DESIGN PROFFESIONAL FOR COMPLIANCE WITH THE REQUIREMENTS OF CHAPTERS 3, 5, 6 AND 7 OF ICC500-2021.
2. ICC500-2021, 106.2 SPECIAL INSPECTIONS: COMPLY WITH ALL REQUIREMENTS OF 106.2, 106.2.1, 106.3 AND 106.3.1.
3. ICC500-2021, 106.4 STRUCTURAL OBSERVATIONS: IMEG SHALL CONDUCT VISUAL OBSERVATIONS AT SIGNIFICANT STAGES OF CONSTRUCTION FOR GENERAL CONFORMANCE TO THE CONSTRUCTION DOCUMENTS. CONTRACTOR TO PROVIDE ENGINEER OF RECORD WITH WEEKLY PROGRESS UPDATES TO ENSURE OBSERVATIONS ARE SCHEDULED AT NECESSARY TIMES.

REQUIRED VERIFICATION AND SPECIAL INSPECTIONS PER ICC-500 SECTION 106.2

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. VERIFY ELEMENT MATERIALS, SIZES AND LENGTHS COMPLY WITH THE REQUIREMENTS	X	-
2. DOWELS FROM FOUNDATION	-	X
3. MASONRY CONSTRUCTION	-	X
4. POST INSTALLED ANCHORS OF ANY PART OF EXTERIOR ENCLOSURES (I.E. DOORS, WINDOWS, SHUTTERS, ETC)	X	-
5. OBSERVE INSTALLATION OPERATION AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT	X	-

STORM SHELTER MILESTONES

- DOWELS FROM FOUNDATION
- DOWELS FROM DRILLED PIERS INTO GRADE BEAM AND FROM GRADE BEAMS INTO CMU WALLS
- MASONRY CONSTRUCTION
- POST INSTALLED ANCHORS

ICC QUALITY ASSURANCE PLAN:

1. THE FOLLOWING INFORMATION PERTAINS TO THE SHELTER SPACE ONLY.
2. THE MAIN WINDFORCE-RESISTING SYSTEM CONSISTS OF PRECAST CONCRETE PLANKS WITH COMPOSITE TOPPING WHICH TRANSFERS HORIZONTAL WIND LOAD TO MASONRY SHEAR WALLS. THE LATERAL LOADS ARE TRANSFERRED TO THE SOILS BY CONCRETE GRADE BEAMS AND DRILLED PIERS..
3. TESTING AND INSPECTION FOR SHELTER ELEMENTS WILL BE THE SAME AS FOR THE REST OF THE BUILDING. FOLLOW THE TESTING AND INSPECTION INFORMATION FOR ALL MATERIALS AND CONNECTIONS AS LISTED IN THE SPECIFICATIONS.
4. SPECIAL INSPECTIONS SHALL BE PERIODIC OR CONTINUOUS AS LISTED FOR EACH MATERIAL AND CONNECTION. SIGNED REPORTS SHALL BE SUBMITTED TO THE OWNER, CONTRACTOR, ARCHITECT, AND ENGINEER.
5. REFER TO ARCHITECTURAL AND MECHANICAL SPECIFICATIONS FOR ADDITIONAL TESTING REQUIREMENTS.
6. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A COMPONENT OF THE SHELTER STRUCTURE SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE AUTHORITY HAVING JURISDICTION, THE RESPONSIBLE DESIGN PROFESSIONAL, AND OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT SHALL CONTAIN:
   A. ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE QUALITY ASSURANCE PLAN.
   B. ACKNOWLEDGEMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS.
   C. PROCEDURES FOR EXERCISING CONTROL WITHIN THE CONTRACTOR'S ORGANIZATION, THE METHOD AND FREQUENCY OF REPORTING AND DISTRIBUTION OF REPORTS.
   D. IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THEIR POSITION(S) IN THE ORGANIZATION.

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08/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SPECIAL INSPECTION SCHEDULES

SHEET:
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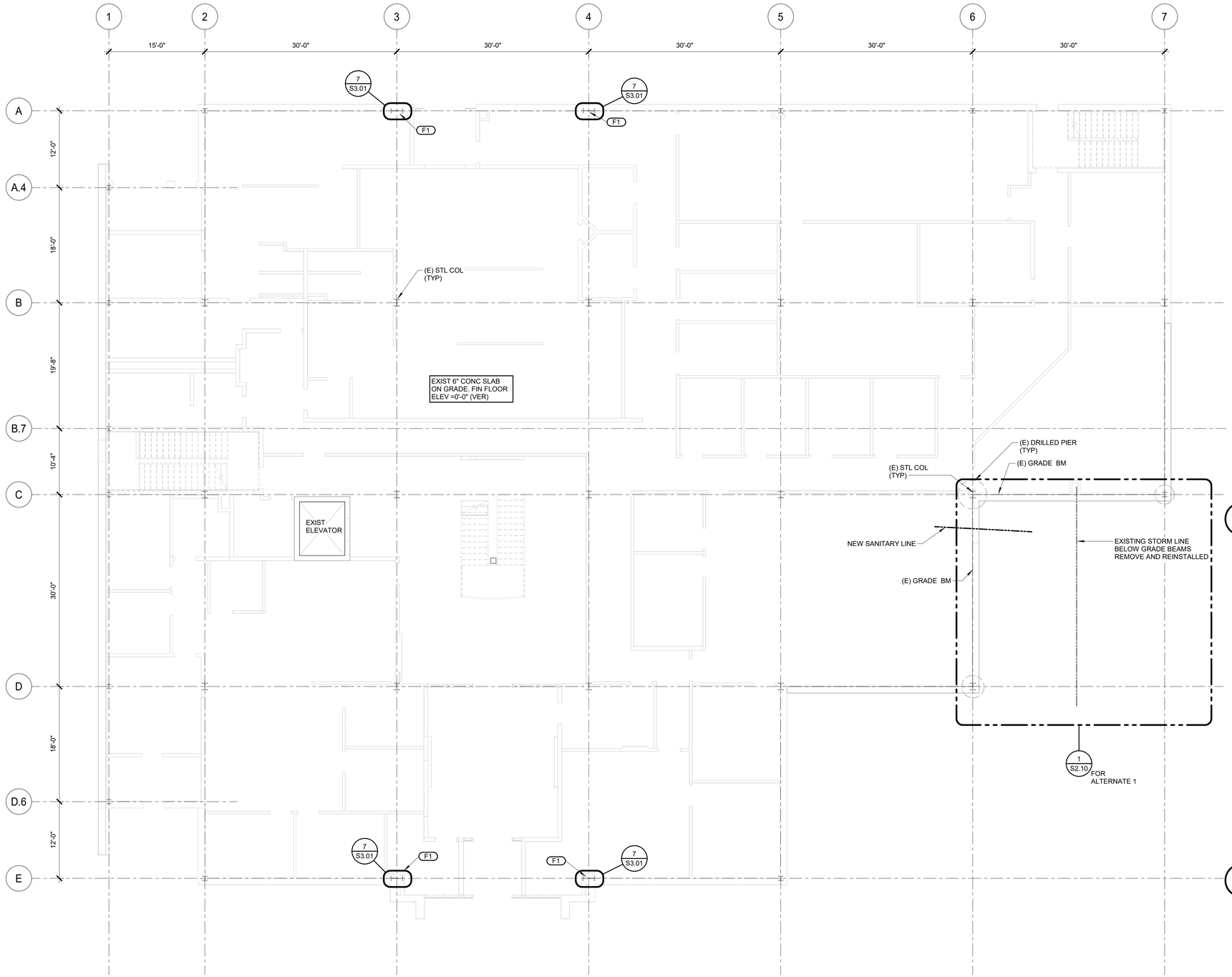


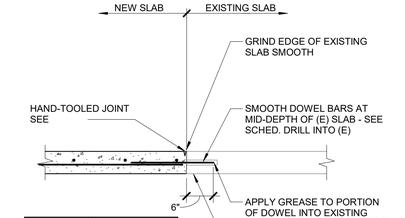
1 LEVEL 01
1/8" = 1'-0"

GENERAL SHEET NOTES:

1. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. CONTRACTOR VERIFY ALL DIMENSIONS WITH ARCH DRAWINGS.
3. STEEL STRUCTURE HAS SPRAY FIRE PROOFING. REMOVE AND REPLACE FOR ALTERATIONS TO MEET FIRE RATING SHOWN ON ARCH DWGS. TYPICAL ALL FLOORS.
4. PATCH ALL REMOVED SLAB ON GRADE WITH NEW SLAB w/ #4 @ 16" EW. DOWEL TO EXISTING SLAB PER 2/S2.01
5. SEE GENERAL NOTES AND TYPICAL DETAILS FOR ADDITIONAL INFORMATION.
6. SEE S3.02 FOR TORNADO SHELTER SPECIFIC DETAILS.

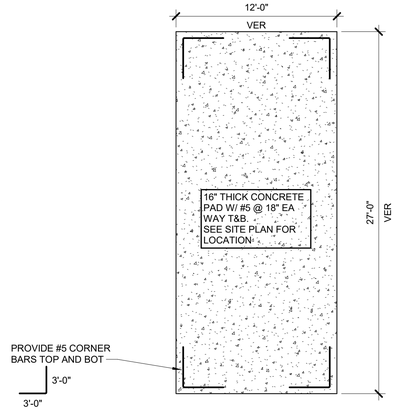
KEYNOTES: (F#)

1. REMOVE AND REPLACE FINISHES AND SLAB ON GRADE TO EXPOSE COLUMN BASE PLATE AND COMPLETE ALTERATIONS PER DETAILS AND NOTES
2. GENERATOR SLAB. VERIFY PAD DIMENSIONS WITH ELEC. SEE SITE PLAN FOR LOACATION. SEE 3/S2.01



SLAB THICKNESS	SMOOTH DOWEL
4"	1/2"Ø x1'-4"@18"
5"	3/4"Ø x1'-4"@12"
6"	
> 6"	1"Ø x1'-4"@12"

2 NEW TO EXISTING SLAB-ON-GRADE CONNECTION
3/4" = 1'-0"
2021-08



3 GENERATOR SLAB
3/16" = 1'-0"

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CITY OF WATERLOO
NEW CITY HALL/ POLICE HEADQUARS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 08/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: LEVEL 01

SHEET: S2.01

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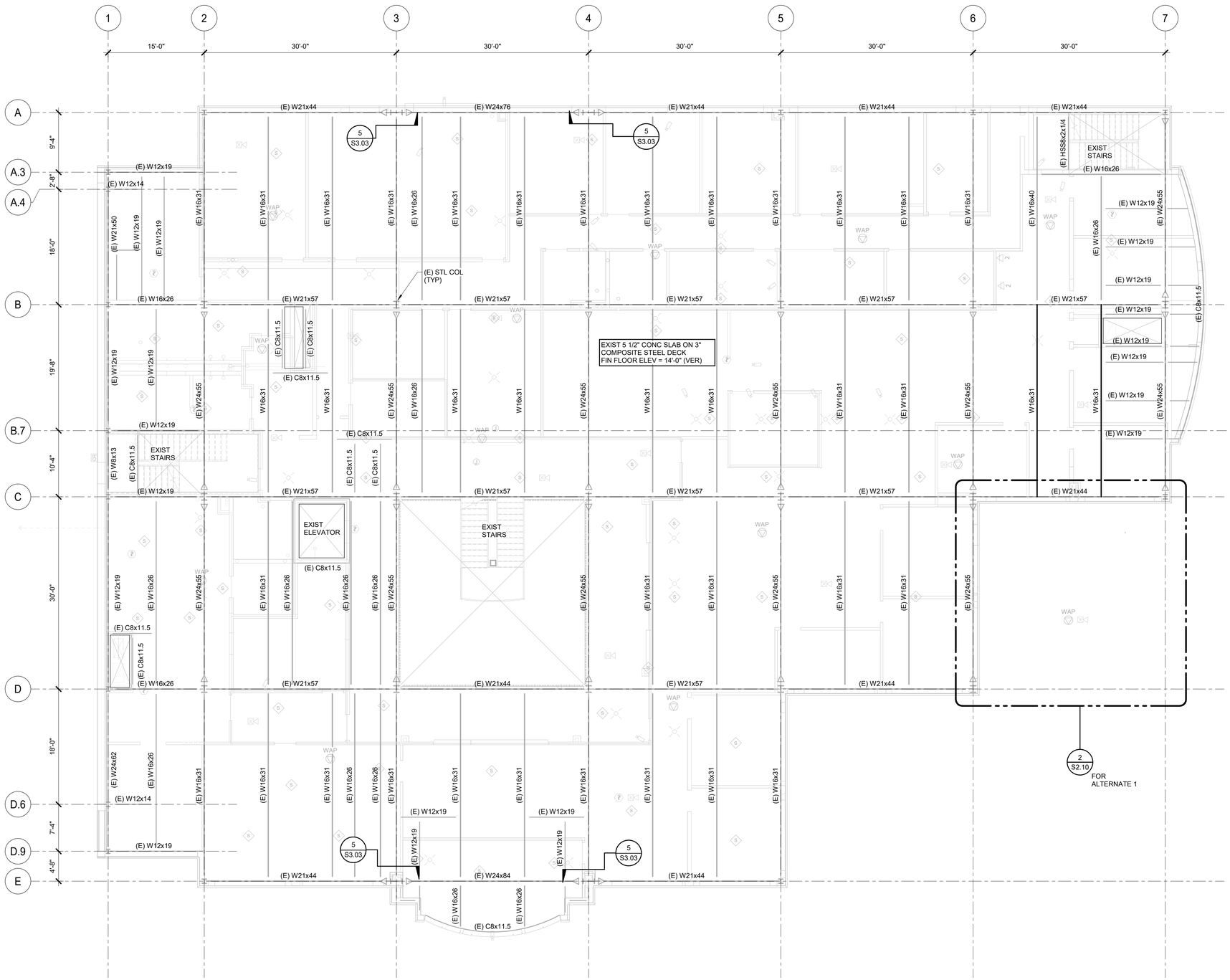

NORTH

1 LEVEL 02
1/8" = 1'-0"

GENERAL SHEET NOTES:

1. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. CONTRACTOR VERIFY ALL DIMENSIONS WITH ARCH DRAWINGS.
3. STEEL STRUCTURE HAS SPRAY FIRE PROOFING. REMOVE AND REPLACE FOR ALTERATIONS TO MEET FIRE RATING SHOWN ON ARCH DWGS. TYPICAL ALL FLOORS.
4. PATCH ALL REMOVED SLAB ON GRADE WITH NEW SLAB w/ #4 @ 16" EW. DOWEL TO EXISTING SLAB PER 2/S2.01.
5. SEE GENERAL NOTES AND TYPICAL DETAILS FOR ADDITIONAL INFORMATION.
6. SEE S3.02 FOR TORNADO SHELTER SPECIFIC DETAILS.

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MICHAEL P. MERRON 21018 08-26-2026 LICENSED PROFESSIONAL ENGINEER IOWA

CITY OF WATERLOO
NEW CITY HALL/ POLICE HEADQUARS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
08/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
LEVEL 02

SHEET:
S2.02

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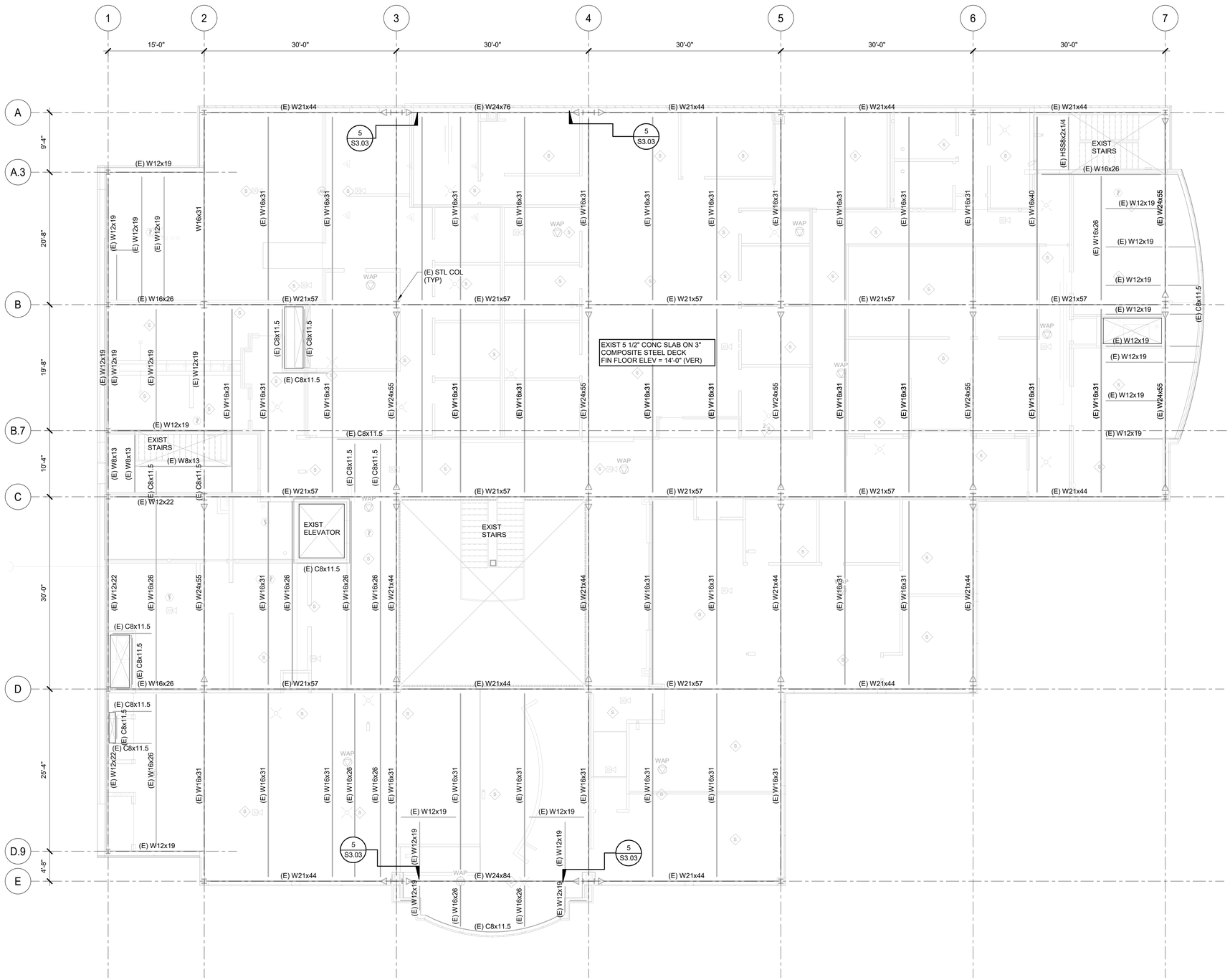

1 **LEVEL 03**
1/8" = 1'-0"

NORTH

GENERAL SHEET NOTES:

1. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. STEEL STRUCTURE HAS SPRAY FIRE PROOFING. REMOVE AND REPLACE FOR ALTERATIONS TO MEET FIRE RATING SHOWN ON ARCH DWGS. TYPICAL ALL FLOORS.
3. SEE GENERAL NOTES & TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

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21018
08-26-2026
IOWA

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NEW CITY HALL/ POLICE HEADQUARS

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SHEET NAME:
LEVEL 03

SHEET:
S2.03

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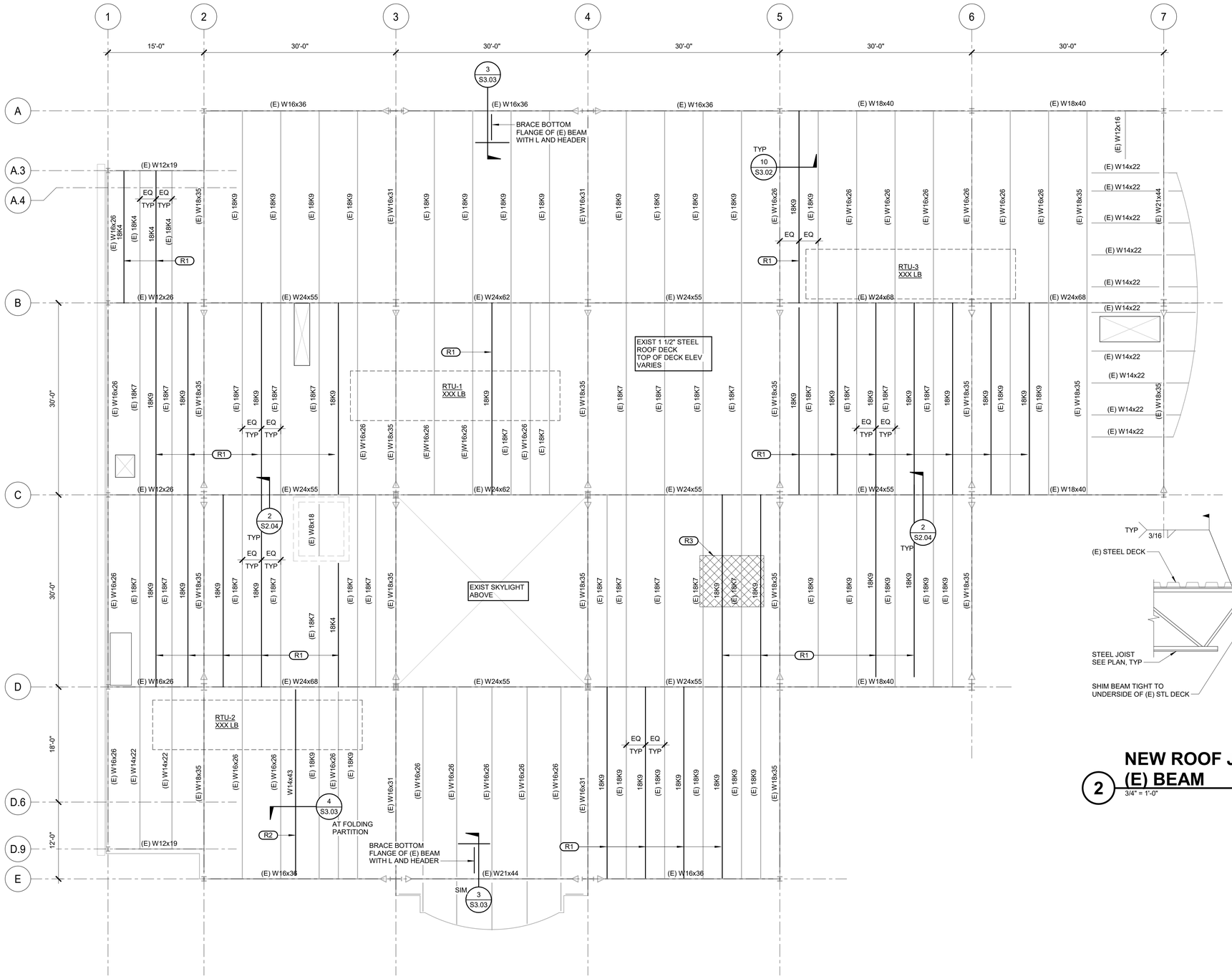


1 ROOF
1/8" = 1'-0"

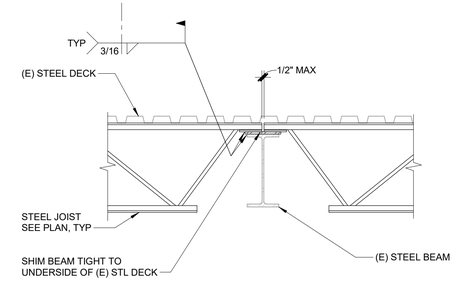
NORTH

GENERAL SHEET NOTES:

1. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. STEEL STRUCTURE HAS SPRAY FIRE PROOFING. REMOVE AND REPLACE FOR ALTERATIONS TO MEET FIRE RATING SHOWN ON ARCH DWGS. TYPICAL ALL FLOORS.
3. SEE GENERAL NOTES & TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

KEYNOTES: R#

1. REMOVE ALL CEILINGS, BRIDGING, MECH, ELEC, ETC. AS REQ'D TO PLACE NEW STL JST's REPLACE AFTER NEW STL JSTS ARE LOCATED & FASTENED. NEW JST's SHALL BE FABRICATED W/ A 2" DEEP JST END BRG & SHIMMED TIGHT TO UNDERSIDE OF DECK. JST TOP CHORD TO BE DESIGNED ACCORDINGLY. (FABRICATOR SHALL SHIP JST's IN TWO SECTIONS & FIELD SPLICE). PROVIDE MINIMUM 2.5" ON STEEL BEAMS. ANCHOR DECK TO JST TOP CHORDS PER 10/S3.02.PATCH ROOFING AS REQ'D TO MATCH EXIST'G CONTRACTOR SHALL FIELD VER ALL EXIST'G BLDG CONDITIONS AND BE TOTALLY FAMILIAR W/ MECH & ELEC SYSTEMS THAT MUST BE REMOVED IN ORDER TO PLACE NEW JST's EXIST'G BRDG SHALL BE REMOVED & REPLACED W/ NEW HORIZ BRDG IT MAY BE NECESSARY TO BACKSHORE EXIST'G JST's IN ORDER TO PLACE NEW JST's
2. NEW FOLDING PARTITION SUPPORT BEAM. PROVIDE MOMENT (WEB AND FLANGES) BOLTED SPILCE AT 1/3 rd POINT. CLIP TO EXISTING GIRDER BEAMS EACH END. ANCHOR TOP FLANGE TO STEEL ROOF DECK PER 7/S3.03.
3. DRONE DOCK PLATFORM. SEE ARCH FOR LOCATION AND DETAILS. ANCHOR SOLIDLY TO STEEL ROOF DECK WITH SELF TAPPING #12-14 SCREWS.



2 NEW ROOF JST BEARING ON (E) BEAM
3/4" = 1'-0"

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PROJECT NO: 24102

DATE: 08/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: ROOF

SHEET: S2.04

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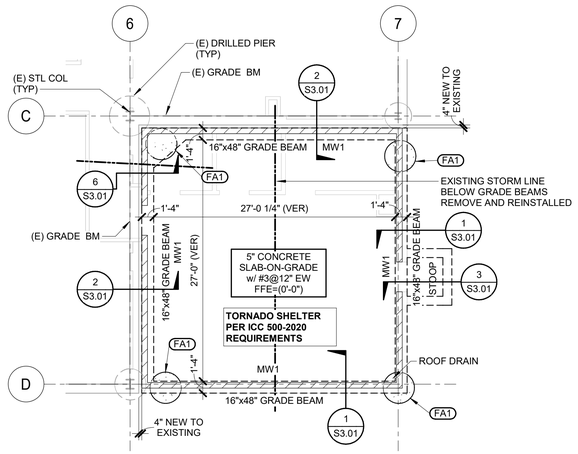
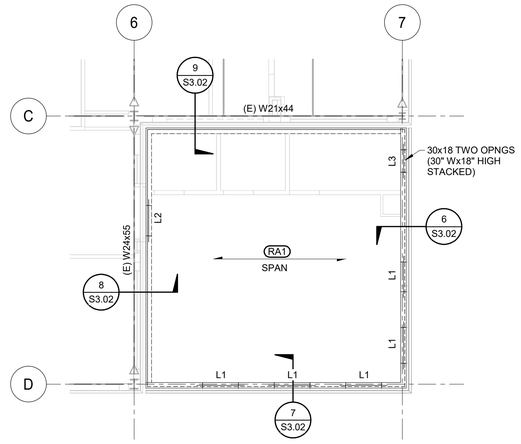


1 LEVEL 01 Alt 1

1/8" = 1'-0"



2 LEVEL 02 Alt 1

1/8" = 1'-0"

GENERAL SHEET NOTES:

1. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
2. CONTRACTOR VERIFY ALL DIMENSIONS WITH ARCH DRAWINGS.
3. STEEL STRUCTURE HAS SPRAY FIRE PROOFING. REMOVE AND REPLACE FOR ALTERATIONS TO MEET FIRE RATING SHOWN ON ARCH DWGS. TYPICAL ALL FLOORS.
4. PATCH ALL REMOVED SLAB ON GRADE WITH NEW SLAB w/ #4 @ 16" EW. DOWEL TO EXISTING SLAB PER 2/S2.01.
5. SEE GENERAL NOTES AND TYPICAL DETAILS FOR ADDITIONAL INFORMATION.
6. SEE S3.02 FOR TORNADO SHELTER SPECIFIC DETAILS.

KEYNOTES: (FA#)

1. PROVIDE 3'-6" Ø CONCRETE DRILLED PIER x 19'-0" LONG, SEE DETAIL 5/S3.01

KEYNOTES: (RA#)

1. 12" PRECAST CONCRTE PLANK + 6" STRUCTURAL TOPPING REINF W/ #4 @ 16" EACH WAY. SUPERIMPOSED LOADS= 375 PSF LL + 20 PSF DL + PLANK AND TOPPING SELF-WEIGHT. TOP OF PLANK & TOPPING EL=(12'-10" VER) SEE 4/S3.02. FOR WIND LOADS SEE 8/S3.03.

LINTEL SCHEDULE

MARK	MEMBER SIZE	REFERENCE DETAIL	REMARKS
L1	24" BOND BEAM x (WALL WIDTH) w/ (2)#5 T&B + L7x4x3/8 (LLH)	-	1, 2
L2	24" BOND BEAM x (WALL WIDTH) w/ (2)#5 T&B	-	1
L3	24" BOND BEAM x (WALL WIDTH) w/ (2)#5 T&B + L7x4x3/8 (LLH)	-	1

NOTE:

1. BEARING LENGTH EA END = 16" UON. EXTEND VERTS THROUGH BOND BEAMS.
2. CONTINOUS OVER ALL OPENINGS FROM CORNER TO CORNER OF BUILDING. EXTEND VERTS THROUGH BOND BEAM.

MASONRY WALL SCHEDULE - ALTERNATE 1

WALL TYPE	WALL THICKNESS	VERTICAL WALL REINFORCING
MW1	8"	#6 @ 8" (CENTERED)

NOTES:

1. TYP HORIZ REINF TO BE (1)#4 @ 48" PLUS WIRE REINF PER SPECIFICATIONS AND GENERAL NOTES.
2. REINFORCED CORES ARE ALWAYS GROUTED. PROVIDE MATCHING DOWEL BARS TO GRADEBEAMS.
3. EXTEND ALL REBAR TO TOP OF WALL.
4. ALL CORES TO BE GROUTED SOLID AND REINFORCED WITH VERTICAL REBAR
5. NO CONTROL JOINTS IN TORNADO SHELTER WALLS.

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PROJECT NO:
24102

DATE:
08/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
STORM SHELTER ALT 1 - FOUNDATION AND ROOF FRAMING PLANS

SHEET:
S2.10

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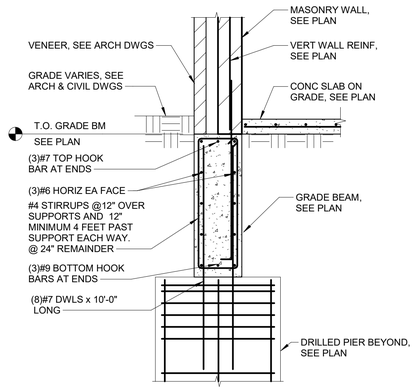
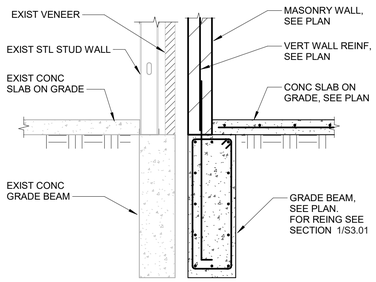
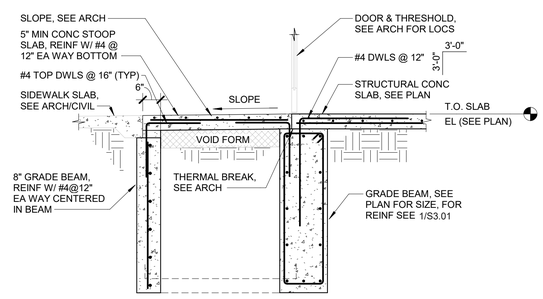


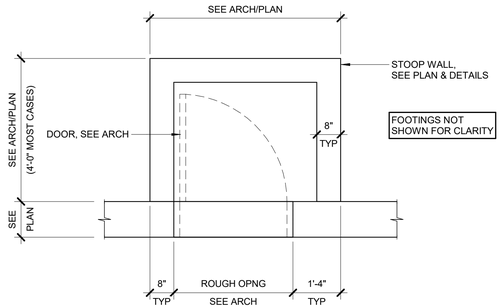
1 SECTION
1/2" = 1'-0"



2 SECTION
1/2" = 1'-0"



3 TYPICAL STOOP DETAIL
1/2" = 1'-0"



PLAN VIEW

4 TYPICAL STOOP LAYOUT DIAGRAM
1/2" = 1'-0"

5 DRILLED PIER DETAIL
3/4" = 1'-0"

6 SECTION
1/2" = 1'-0"

7 PLAN VIEW DETAIL
1" = 1'-0"

CLASS B TENSION LAP SPLICE LENGTH									
REINF STEEL, Fy	BAR SIZE	BAR LOCATION	CONCRETE STRENGTH, f'c						
			3 KSI	4 KSI	5 KSI	6 KSI	7 KSI	8 KSI	9 KSI	10 KSI
60 KSI	#3	TOP	2'-4"	2'-1"	1'-10"	1'-8"	1'-7"	1'-6"	1'-5"	1'-4"
		OTHER	1'-10"	1'-7"	1'-5"	1'-4"	1'-2"	1'-2"	1'-1"	1'-0"
	#4	TOP	3'-2"	2'-9"	2'-5"	2'-3"	2'-1"	1'-11"	1'-10"	1'-9"
		OTHER	2'-5"	2'-1"	1'-11"	1'-9"	1'-7"	1'-6"	1'-5"	1'-4"
	#5	TOP	3'-11"	3'-5"	3'-0"	2'-9"	2'-7"	2'-5"	2'-3"	2'-2"
		OTHER	3'-0"	2'-7"	2'-4"	2'-2"	2'-0"	1'-10"	1'-9"	1'-8"
	#6	TOP	4'-8"	4'-1"	3'-8"	3'-4"	3'-1"	2'-11"	2'-9"	2'-7"
		OTHER	3'-7"	3'-1"	2'-10"	2'-7"	2'-4"	2'-3"	2'-1"	2'-0"
	#7	TOP	6'-9"	5'-11"	5'-3"	4'-10"	4'-6"	4'-2"	3'-11"	3'-9"
		OTHER	5'-3"	4'-6"	4'-1"	3'-9"	3'-5"	3'-3"	3'-0"	2'-11"
	#8	TOP	7'-9"	6'-9"	6'-0"	5'-6"	5'-1"	4'-9"	4'-6"	4'-3"
		OTHER	6'-0"	5'-2"	4'-8"	4'-3"	3'-11"	3'-8"	3'-6"	3'-3"
	#9	TOP	8'-9"	7'-7"	6'-9"	6'-2"	5'-9"	5'-4"	5'-1"	4'-10"
		OTHER	6'-9"	5'-10"	5'-3"	4'-9"	4'-5"	4'-2"	3'-11"	3'-8"
	#10	TOP	9'-10"	8'-6"	7'-8"	7'-0"	6'-5"	6'-0"	5'-8"	5'-5"
		OTHER	7'-7"	6'-7"	5'-11"	5'-4"	5'-0"	4'-8"	4'-5"	4'-2"
	#11	TOP	10'-11"	9'-6"	8'-6"	7'-9"	7'-2"	6'-8"	6'-4"	6'-0"
		OTHER	8'-5"	7'-3"	6'-6"	5'-11"	5'-6"	5'-2"	4'-10"	4'-7"

NOTES:

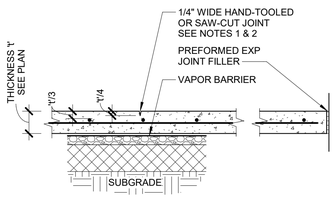
1. SPLICE LENGTHS SHOWN ARE APPLICABLE FOR SPLICES OCCURRING UNDER THE FOLLOWING CONDITIONS.
   A. NORMAL-WEIGHT CONCRETE
   B. MIN BAR SPACING REQUIREMENTS:
      a. CLEAR SPACING BETWEEN BARS AT SPLICE LOCATION > BAR DIAMETER, CLEAR COVER TO BARS ≥ BAR DIAMETER, AND TIES OR STIRRUPS OCCUR PER CODE SPACING WITHIN LENGTH OF SPLICE; OR
      b. CLEAR SPACING BETWEEN BARS AT SPLICE ≥ 2 x BAR DIAMETER AND CLEAR COVER > BAR DIAMETER
2. INDICATED SPLICE LENGTHS SHALL BE INCREASED BY THE LISTED FACTORS WHERE THE FOLLOWING CONDITIONS EXIST.

CONDITION	SPLICE LENGTH MULTIPLIER*
A. BAR SPACING OR CLEAR COVER IS LESS THAN REQUIRED PER NOTE 1	1.5
B. LIGHTWEIGHT CONCRETE	1.3
C. EPOXY COATED REINF WITH COVER < 3 x BAR DIAMETER OR CLEAR SPACING < 6 x BAR DIAMETER	1.5
D. ALL OTHER EPOXY COATED BARS	1.2

   *WHERE MULTIPLE CONDITIONS EXIST, APPLY EACH OF THE APPLICABLE FACTORS TO THE TABULATED TENSION LAP SPLICE LENGTH TO OBTAIN THE REQUIRED SPLICE LENGTH.
3. TOP BARS ARE HORIZ BARS LOCATED WHERE MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BARS.
4. USE SMALLER BAR SIZE TO DETERMINE LENGTH WHERE SPLICING BARS OF DIFFERENT SIZES.

DUMMY SCHED

11 CLASS B TENSION LAP SPLICE LENGTHS
3/4" = 1'-0"
3010-01

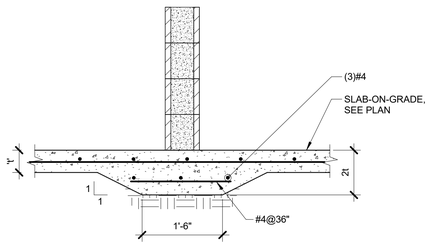


CONTRACTION JOINT ISOLATION JOINT

NOTES:

1. FOR SAW-CUT JOINTS, USE A "SOFF-CUT" ULTRA EARLY ENTRY DRY-CUT SAW OR APPROVED EQUIVALENT. JOINTS SHALL BE INSTALLED IMMEDIATELY UPON COMPLETION OF FINISHING OPERATIONS.
2. SEE SPECIFICATIONS AND ARCHITECTURAL DRAWINGS FOR ANY JOINT SEALANT REQUIREMENTS.

8 SLAB-ON-GRADE CONSTRUCTION
3/4" = 1'-0"
2020-01



NOTES:

1. CENTER THICKENED SLAB ABOUT WALL. SEE ARCH DRAWINGS FOR WALL LOCATIONS.
2. PROVIDE CORNER DOWELS AT INTERSECTIONS OF THICKENED SLABS PER
3. APPLICABLE AT INTERIOR, NON-STRUCTURAL WALLS BRACED AT THE TOP OF WALL.

9 NON-STRUCTURAL CMU WALL ON THICKENED SLAB
3/4" = 1'-0"
2020-11

CMU REINFORCING BAR LAP/ DEVELOPMENT LENGTH (L_d) SCHEDULE f'm=2500 PSI				
CMU THICKNESS	REINFORCING LOCATION	BAR SIZE	L_d	REMARKS
6"	SINGLE LAYER, REINF CENTERED IN WALL	#3	12"	
		#4	16"	
		#5	25"	
8"	SINGLE LAYER, REINF CENTERED IN WALL	#4	12"	
		#5	18"	
		#6	34"	
		#7	47"	
10" / 12"	SINGLE LAYER, REINF CENTERED IN WALL	#4	12"	
		#5	14"	
		#6	26"	
		#7	36"	
8" / 10" / 12"	DOUBLE LAYER, REINF W/ 2 1/2" MIN CLR COVER	#4	16"	
		#5	25"	
		#6	46"	
		#7	63"	

NOTES:

1. PROVIDE LAP SPLICE LENGTHS TO MATCH Ld VALUES PROVIDED IN SCHED OR USE MECHANICAL SPLICES ADEQUATE FOR 125% OF SPECIFIED YIELD STRENGTH OF THE BAR.
2. WHERE TWO DIFFERENT SIZES OF REINF BARS ARE LAPPED, PROVIDE Ld FOR SMALLER REINF BAR.
3. DOWEL EMBED INTO CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE CAST-IN-PLACE CONCRETE GENERAL NOTES.
4. WHEN EPOXY-COATED REINF BARS ARE USED, INCREASE TABULATED VALUES BY A FACTOR OF 1.5.

10 f'm=2500 REINFORCING BAR LAP/DEVELOPMENT LENGTH (Ld)
3/4" = 1'-0"
4010-02

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CITY OF WATERLOO
NEW CITY HALL/ POLICE HEADQUARS
100 E 4TH ST, WATERLOO, IA

PROJECT NO: 24102

DATE: 08/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: FOUNDATION SECTIONS

SHEET: S3.01

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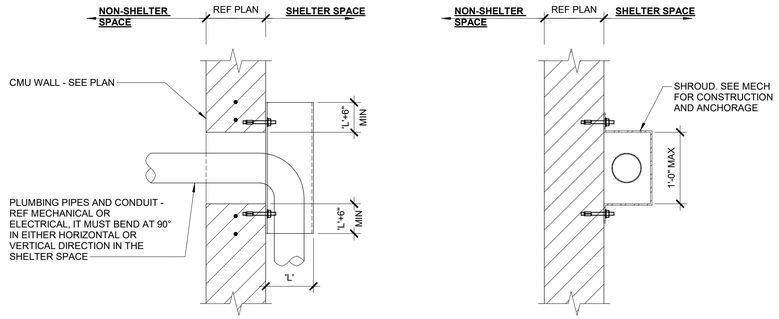


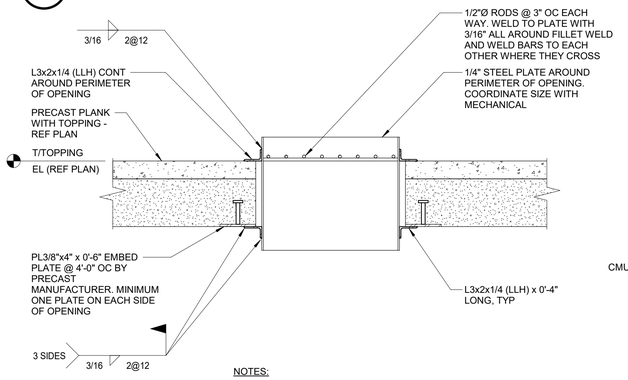
VERTICAL SECTION **PLAN SECTION**

NOTES:

1. THIS DETAIL APPLIES TO PLUMBING, PIPES AND CONDUITS LARGER THAN 2" THAT PENETRATE THE CEILING OR WALLS OF THE TORNADO SHELTER.
2. GAP FROM WALL TO PLATE IS SET BY MECHANICAL OR ELECTRICAL. THAT DIMENSION MATCHES THE VERTICAL GAP DIMENSIONS.
3. MINIMUM DISTANCE FROM OPENING EDGE TO ANCHOR IS 5".

1 PIPE PENETRATION PROTECTION DETAIL

1" = 1'-0"

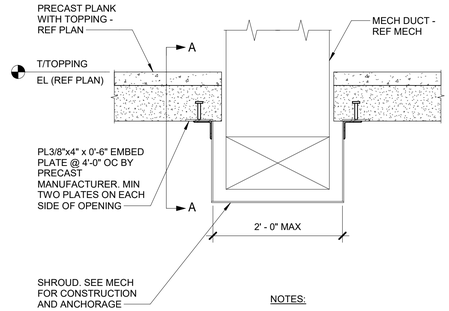


NOTES:

1. MINIMUM HEIGHT IS 2". COORDINATE PLATE HEIGHT WITH MECHANICAL CONTRACTOR FOR DUCT CONNECTION AND MECHANICAL EQUIPMENT CLEARANCE.
2. DESIGN EACH EMBED FOR 1 KIP HORIZONTAL FORCE.

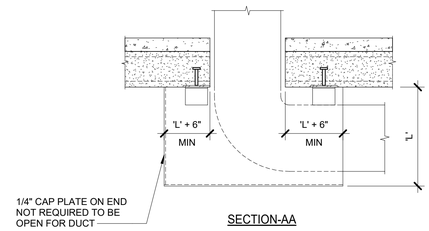
2 ROOF OPENING DETAIL

3/4" = 1'-0"



NOTES:

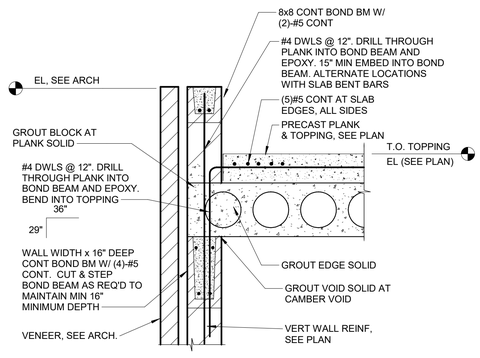
1. COORDINATE PLATE SIZE WITH MECHANICAL CONTRACTOR FOR DUCT CLEARANCE.
2. THIS LENGTH OF STEEL PLATE PAST THE EDGE OF THE PRECAST OPENING NEEDS TO MATCH THE LENGTH OF PLATE DETERMINED FROM NOTE 1.
3. DESIGN EACH EMBED FOR 1 KIP DOWNWARD FORCE.



SECTION-AA

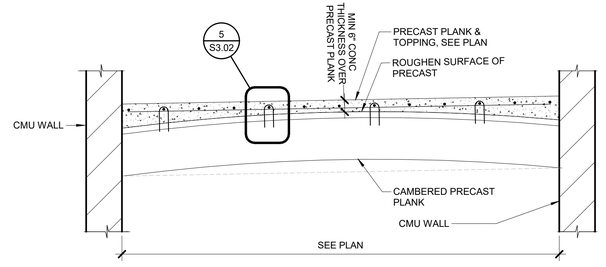
3 ROOF OPENING DETAIL

1" = 1'-0"



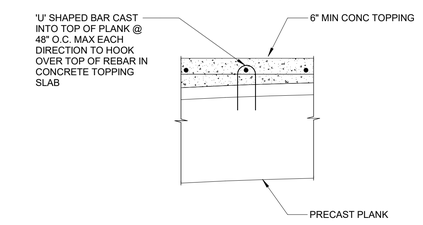
4 MINIMUM CONC OVER PRECAST PLANK

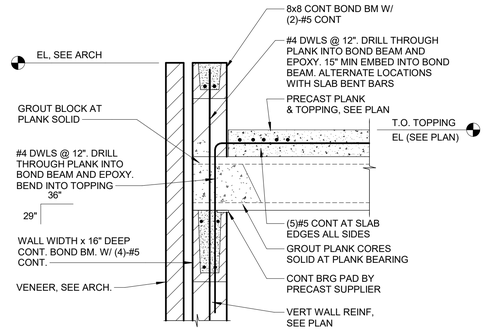
NO SCALE



5 SECTION

1" = 1'-0"



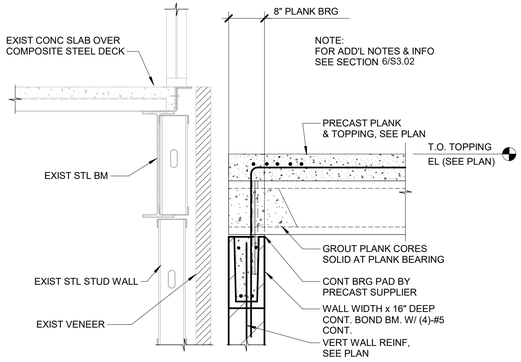


6 SECTION

3/4" = 1'-0"

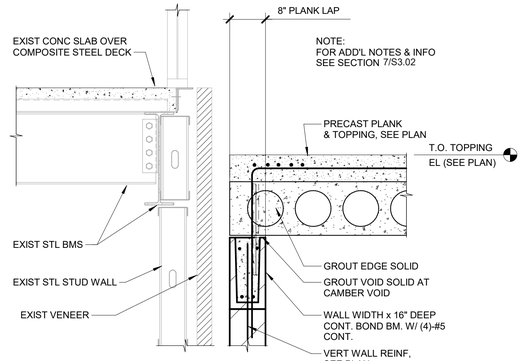
7 SECTION

3/4" = 1'-0"



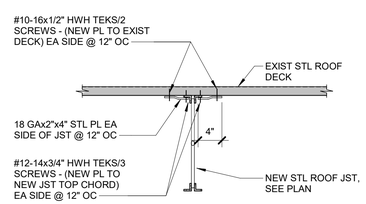
8 SECTION

3/4" = 1'-0"



9 SECTION

3/4" = 1'-0"



10 NEW JST AT EXIST ROOF

NO SCALE

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CONSULTANT:

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

MICHAEL P. MERRON 21018 LICENSED PROFESSIONAL ENGINEER 08-26-2026 IOWA

CITY OF WATERLOO
NEW CITY HALL/ POLICE HEADQUARS
100 E 4TH ST, WATERLOO, IA

PROJECT NO: 24102

DATE: 08/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: ROOF SECTIONS

SHEET: S3.02

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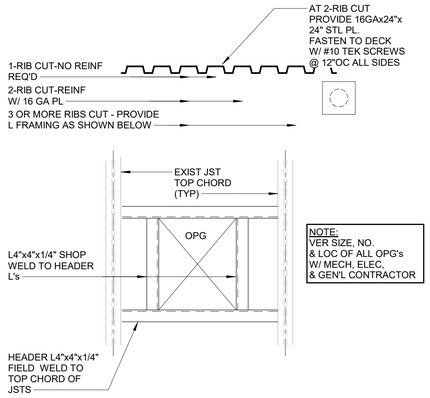
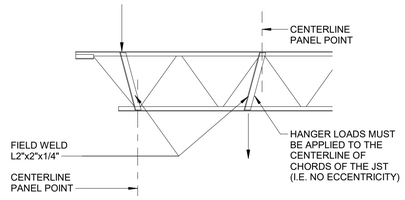
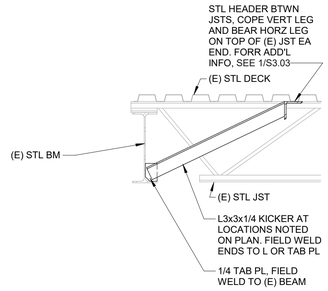


1 OPG. FRAME PLAN VIEW
3/4" = 1'-0"

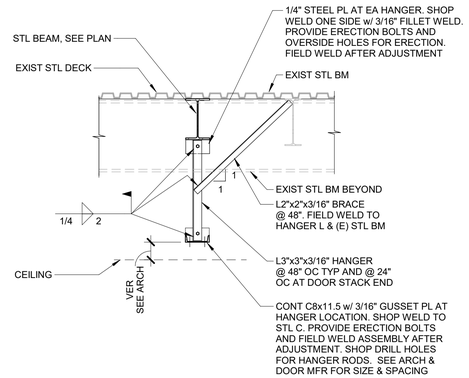


NOTE:
1. UNLESS NOTED OTHERWISE, JOIST CHORDS ARE NOT DESIGNED FOR CONCENTRATED LOADS IN EXCESS OF 150 POUNDS. EITHER PLACE LOADS WITHIN 4" OF PANEL POINT OR ADD EXTRA WEB MEMBERS FROM POINT OF LOAD TO NEAREST PANEL POINT ON OPPOSITE CHORD.

2 CONCENTRATED LOAD CONDITION AT JOIST
3/4" = 1'-0"



3 SECTION
3/4" = 1'-0"



4 SECTION
1/2" = 1'-0"

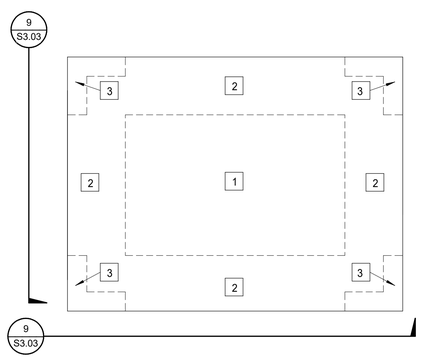
5 SECTION
3/4" = 1'-0"

SINGLE PLATE CONNECTION SCHEDULE

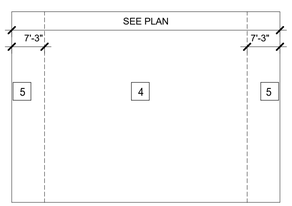
BEAM SIZE	NO. OF BOLTS	CONNECTION WITH 3/4"Ø BOLTS	
		PL THICK	PL WELD
C8, C10	2	3/8"	3/16"
W8, W10	2	3/8"	3/16"
W12, W14	3	3/8"	3/16"
W16	4	3/8"	1/4"
W18	5	3/8"	1/4"
W21	6	3/8"	1/4"
W24, W27	7	3/8"	1/4"
W30	8	3/8"	1/4"
W33	9	3/8"	1/4"
W36	10	3/8"	1/4"
W40	11	3/8"	1/4"
W44	12	3/8"	1/4"

6 SHEAR CONNECTION TO BEAM
3/4" = 1'-0"

7 NEW BEAM AT EXIST ROOF
1" = 1'-0"



8 STORM SHELTER ROOF PLAN - GROSS WIND PRESSURE
NO SCALE



9 WALL ELEVATION
1/2" = 1'-0"

*** GROSS WIND PRESSURES (1.0W) AT TORNADO SHELTER (BASED ON 250 MPH NOMINAL WIND SPEED)**

	ZONE			REMARK	COMMENT
ROOF	1	90 PSF UPLIFT	215 PSF DOWNWARD	FIELD	AREA OF COMPONENT ≥ 100 FT² ASSUMED
	2	90 PSF UPLIFT	270 PSF DOWNWARD	EDGE	
	3	90 PSF UPLIFT	315 PSF DOWNWARD	CORNER	
WALLS	4	155 PSF PRESSURE	165 PSF SUCTION	FIELD	AREA OF COMPONENT ≥ 50 FT² ASSUMED
	5	155 PSF PRESSURE	185 PSF SUCTION	CORNER	

* NOTE: **ONLY** SELF-WEIGHT OF STRUCTURAL ELEMENTS MAY BE CONSIDERED TO OFFSET WIND UPLIFT - TO BE DESIGNED BY DELEGATED DESIGNERS

10 GROSS WIND PRESSURE AT TORNADO SHELTER
1/8" = 1'-0"

STORM SHELTER DESIGN CRITERIA:

1. SHELTER TYPE: TORNADO (COMMUNITY)
2. EXTENTS: HATCHED AREA SHOWN ON PLAN
3. LOADING STANDARD: DESIGN CONFORMS TO ICC 500-2021.
4. NOMINAL DESIGN WIND SPEED: 250 MPH
5. WIND EXPOSURE CATEGORY: 'C'
6. INTERNAL PRESSURE COEF: GC_{pi}: +/- 0.55 PASSIVE
7. TOPOGRAPHIC FACTOR: K_{zt} = 1.0
8. DIRECTIONAL FACTOR: K_d=1.0
9. THE COMPONENTS OF THE SHELTER ENVELOPE NEED TO BE DESIGNED TO MEET THE PRESSURE AND MISSILE IMPACT TEST REQUIREMENTS IN CHAPTERS 3 AND 8 OF THE ICC 500
10. RAIN INTENSITY, i (IN/HR)-100 YR i=7.04

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CITY OF WATERLOO
NEW CITY HALL/ POLICE HEADQUARS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 08/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: ROOF SECTIONS

SHEET: S3.03

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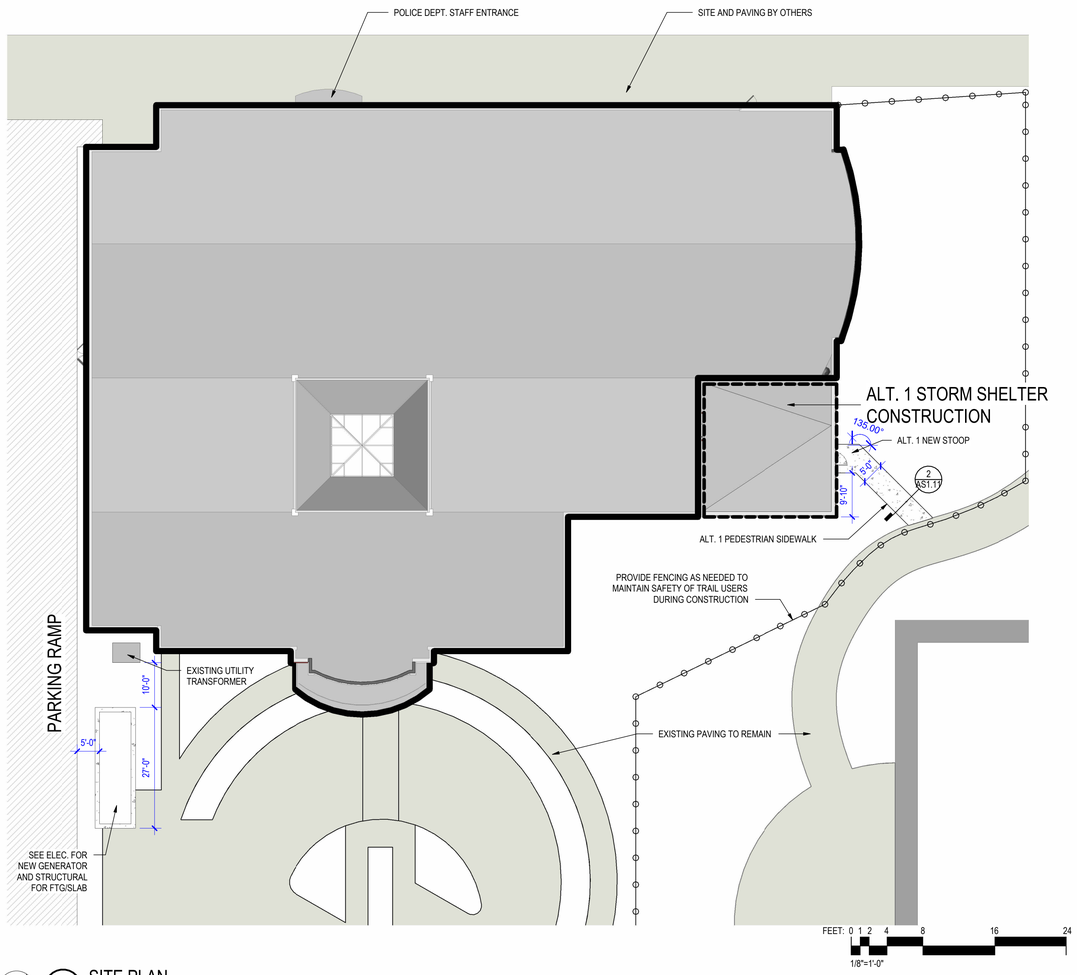
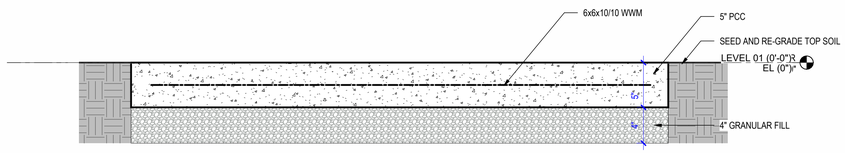


1 SITE PLAN
1/16" = 1'-0"



2 ALT. 1 SIDEWALK SECTION DETAIL
1 1/2" = 1'-0"

GENERAL ARCHITECTURAL SITE NOTES:

1. FIELD VERIFY ALL EXISTING SITE CONDITIONS, UNDERGROUND UTILITIES, ABOVE GRADE UTILITY STRUCTURES, EXTENT OF PAVING AND CURBS, AND VEGETATION. CONTACT IOWA ONE CALL FOR UTILITY LOCATES PRIOR TO ANY SITE PREPARATION OR DEMOLITION. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
2. CONTRACTOR IS TO REMOVE AND REPLACE OR RESTORE ALL STREET SIGNS, PAVEMENT MARKINGS, SITE LIGHTING AND BASES, SIDEWALKS, STEPS, LANDSCAPE STRUCTURES, CURB AND GUTTER, STREETS, DRIVES AND ALL OTHER SURFACE STRUCTURES REMOVED OR OTHERWISE DAMAGED DURING THE COURSE OF THE WORK. PCC PAVEMENT SHALL BE REMOVED AND REPLACED TO NEAREST JOINT.
3. CONTRACTOR SHALL PROTECT ALL UTILITIES FROM DAMAGE DUE TO OPERATION OF HEAVY EQUIPMENT, EXPOSURE AND LACK OF SUPPORT. HAND EXCAVATION WILL BE REQUIRED WHEN EXPOSING EXISTING UTILITIES. THE CONTRACTOR SHALL PROVIDE ADEQUATE SUPPORT OR SHORING FOR ALL EXPOSED EXISTING UTILITIES TO PREVENT DAMAGE.
4. ALL LANDSCAPING INCLUDING TREES, SHRUBS, PERENNIAL PLANTS AND GRASS OR TURF, NOT CALLED OUT TO BE REMOVED ON THE DRAWINGS SHALL BE REPLACED WHERE DAMAGED DURING CONSTRUCTION. WHERE TREES, SHRUBS AND PERENNIAL PLANTS CANNOT, OR ARE NOT PROTECTED, OR ARE OTHERWISE DESTROYED OR DAMAGED BY THE CONTRACTOR, THE TREES, SHRUBS AND PERENNIAL PLANTS SHALL BE REPLACED WITH NEW PLANTS OF THE SAME VARIETY AND SIZE AS THE PLANT DAMAGED OR DESTROYED. WHERE GRASS OR TURF IS DESTROYED, OR DAMAGED DURING CONSTRUCTION, SURFACE SHALL BE RESTORED TO THE CONDITION THAT EXISTED PRIOR TO CONSTRUCTION. REPORT DAMAGE TO EXISTING VEGETATION TO OWNERS REPRESENTATIVE PRIOR TO REPAIR. PERFORM EXCAVATION WITHIN DRIP-LINE OF LARGE TREES TO REMAIN BY HAND, AND PROTECT THE ROOT SYSTEM FROM DAMAGE OR DRY OUT TO THE GREATEST EXTENT POSSIBLE. MAINTAIN MOIST CONDITION FOR ROOT SYSTEM AND COVER EXPOSED ROOTS WITH BURLAP. PAINT ROOT CUTS OF 1" DIAMETER AND LARGER WITH EMULSIFIED ASPHALT TREE PAINT.
5. 4TH STREET AND 5TH STREET MUST REMAIN OPEN DURING CONSTRUCTION. THE ON-SITE PARKING AND DRIVEWAY MAY BE CLOSED DURING CONSTRUCTION AND USED FOR STAGING. TRAIL SIDEWALKS MUST REMAIN OPEN AND PROTECTED BY CONSTRUCTION FENCING.
6. WHERE A SECTION OF PAVEMENT, CURB AND GUTTER, OR SIDEWALK IS CUT OR OTHERWISE DAMAGED BY THE CONTRACTOR, THE ENTIRE SECTION SHALL BE REMOVED AND REPLACED. PAVEMENT, CURBS, GUTTERS, AND SIDEWALKS SHALL BE REMOVED A MINIMUM OF TWO FEET BEYOND THE EDGE OF THE TRENCH CUT. CONTRACTOR AND OWNER'S REPRESENTATIVE ARE TO DOCUMENT (OR PHOTO) ALL CRACKED PCC PAVEMENT OR DAMAGED ACC PAVEMENT PRIOR TO CONSTRUCTION. IF NEW CRACKS IN PCC PAVEMENT OR IF ACC PAVEMENT IS DAMAGED DUE TO CONSTRUCTION TRAFFIC (EXTENDS BEYOND CONSTRUCTION LIMITS), CONTRACTOR IS TO REPLACE DAMAGED AREA AT NO ADDITIONAL COST TO THE PROJECT.
7. CLEANUP OF ADJACENT PAVED AREAS SHALL BE PERFORMED ON A DAILY BASIS, OR AS DIRECTED BY OWNERS REPRESENTATIVE AT NO ADDITIONAL COST. PAVEMENT IS TO BE SCRAPED CLEAN OF DEBRIS AND MUD. MUD TRACKS ARE TO BE REMOVED AT THE END OF THE DAY. SURROUNDING ROADS ARE TO BE KEPT FREE OF DEBRIS AND MUD. ALL PEDESTRIAN SIDEWALKS MUST BE KEPT CLEAN & FREE FROM MUD, DIRT & DEBRIS AT ALL TIMES.
8. CONTRACTOR IS TO COORDINATE PARKING W/ CITY.
9. IN THE EVENT THAT PEDESTRIAN LIGHTING CIRCUITS ARE DISRUPTED INTENTIONALLY OR NON-INTENTIONALLY THE CONTRACTOR SHALL IMMEDIATELY PROVIDE A TEMPORARY SPLICE TO REESTABLISH THE CIRCUIT.
10. TYPICAL SAWCUT JOINTS TO BE AT LEAST ONE QUARTER THE DEPTH OF THE SLAB THICKNESS. JOINTS TO BE 10'-0" OC UNLESS OTHERWISE NOTED.
11. PROVIDE POSITIVE DRAINAGE OF SURFACE WATER AWAY FROM BUILDINGS WITHOUT PONDING OF WATER ADJACENT TO BUILDING OR ON PAVEMENTS.
12. SPOT ELEVATIONS, CONTOUR LINES AND UTILITY LOCATIONS SHOWN FOR REFERENCE ONLY - SEE CIVIL.
13. INSTALL ALL CONSTRUCTION FENCING, GATES, AND OTHER CONSTRUCTION AREA SAFETY MEASURES.
14. INSTALL TREE PROTECTION AROUND ALL TREES REQUIRING PROTECTION FENCING. VERIFY THAT TREES DESIGNATED TO BE RELOCATED BY THE FACILITY HAVE BEEN MOVED, IF APPLICABLE.

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DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ARCHITECTURAL SITE PLAN AND SITE DETAILS

SHEET:
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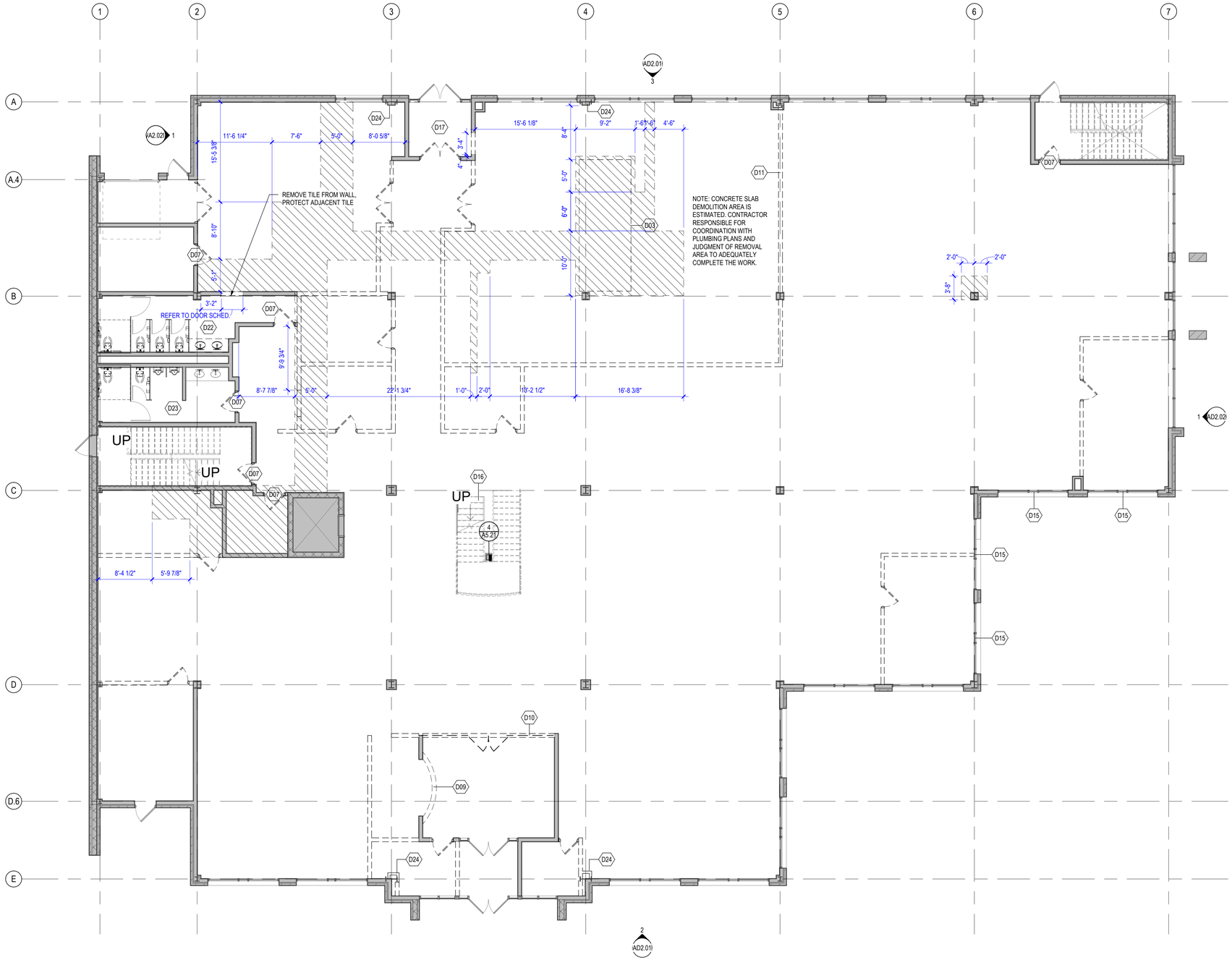

1 1ST FLOOR DEMOLITION PLAN
1/8" = 1'-0"

GENERAL DEMOLITION PLAN NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. EXISTING ROOM NUMBERS AND NAMES SHOWN ON DEMOLITION PLANS. SEE NEW WORK PLANS FOR NEW ROOM NUMBERS AND NAMES.
3. DASHED LINES INDICATE ITEMS TO BE REMOVED. PATCH AND REPAIR ALL ADJACENT SURFACES TO MATCH EXISTING SURFACE.
4. SEE ALL OTHER DISCIPLINES SHEETS FOR ADDITIONAL DEMOLITION.
5. REFER TO DEMOLITION REFLECTED CEILING AND DEMOLITION REFLECTED STRUCTURAL PLANS FOR ADDITIONAL DEMOLITION ITEMS.
6. REFER TO FLOOR PLANS AND INTERIOR ELEVATIONS FOR DIMENSIONS OF NEW OPENINGS NOT DIMENSIONS ON THE DEMOLITION SHEETS.
7. PROTECT ALL ITEMS / SURFACES "TO REMAIN" DURING DEMOLITION / CONSTRUCTION. REPAIR / REPLACE ALL ITEMS DAMAGED DURING DEMOLITION / CONSTRUCTION.
8. PATCH SURFACES TO MATCH ADJACENT SURFACES AT ALL REMOVED (ALL DISCIPLINES) DEVICES.
9. SURFACE TEXTURE OF ALL WALL PATCHES / INFILL TO MATCH ADJACENT EXISTING SURFACES BLEND NEW WALL TEXTURE INTO EXISTING WALL TEXTURE FOR UNIFORM FINISH / APPEARANCE. REPAINT ENTIRE WALL.
10. SEE DEMOLITION INTERIOR AND EXTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION.

DEMOLITION LEGEND:

- EXISTING GYPSUM BOARD / PLASTER CEILING TO REMAIN
- REMOVE EXISTING GYPSUM BOARD / PLASTER CEILING
- REMOVE EXISTING ACOUSTICAL CEILING TILE SYSTEM COMPLETE
- DEMOLISH EXISTING RAISED FLOOR SYSTEM COMPLETE

WALL LEGEND:

- EXISTING WALL
- NEW WALL CONSTRUCTION
- DEMO WALL

DEMOLITION KEYNOTES

#	DESCRIPTION
D01	DEMO ALL FLOOR FINISHES U.N.O.
D02	DEMO ALL CEILING TILE U.N.O.
D03	ESTIMATED CONC. SLAB DEMO AREA. COORDINATE WITH PLUMBING PLANS. SEE NOTE.
D07	DEMO EXISTING INTERIOR DOOR PANELS AND HARDWARE. EXISTING FRAMES TO REMAIN.
D08	SALVAGE CEILING MOUNTED TIME CAPSULE TO OWNER.
D09	DEMO RECEPTION COUNTER, BULKHEAD, & WALL BELOW.
D10	SALVAGE ALUM. STOREFRONT AND DOORS FOR REINSTALLATION.
D11	DEMO EXISTING VISUAL DISPLAY.
D12	ALT. 1 : EXISTING OPERABLE PARTITION TO REMAIN, PROTECT.
D13	SALVAGE EXISTING PROJECTION SCREEN TO OWNER.
D14	DEMO EXISTING H.M. FRAMES & TRANSOM WINDOWS ABOVE DOOR, & EXTENT OF EXISTING WALL BELOW.
D15	ALT. 1 : COMPLETELY REMOVE EXISTING WINDOW UNIT.
D16	DEMO EXISTING FLOOR FINISHES AT LANDINGS, TREADS, AND RISERS. CLEAN AND PREPARE ALL FLOOR SURFACES FOR NEW FINISHES.
D17	PROTECT EXISTING TILE FLOOR AND BASE.
D18	EXISTING OPERABLE PARTITION TO REMAIN, PROTECT.
D19	DEMO EXISTING CASEWORK, COUNTERTOP, AND SINK.
D20	REMOVE EXTERIOR CLADDING, PROTECT FOR REINSTALLATION. REMOVE EXISTING BACKUP ASSEMBLY TO PROVIDE ACCESS TO STRUCTURAL STEEL. REPLACE BACKUP MATERIAL CONSISTENT WITH ADJACENT. VERIFY WEATHER BARRIER CONTINUITY. REINSTALL EXTERIOR CLADDING.
D21	REVIEW SILLS WITH OWNER FOR DEMO AND REPLACEMENT
D22	DEMO COUNTERTOP, SINKS, TOILETS. PROTECT PARTITIONS.
D23	DEMO TOILETS, URINALS, FAUCETS. PROTECT PARTITIONS.
D24	DEMO WALLS AS REQUIRED TO COMPLETE STRUCTURAL MODIFICATIONS
D25	REMOVE EXISTING ROOF, INSULATION, AND ACCESSORIES COMPLETE TO STRUCTURAL DECK BELOW, PREPARE FOR NEW ROOFING

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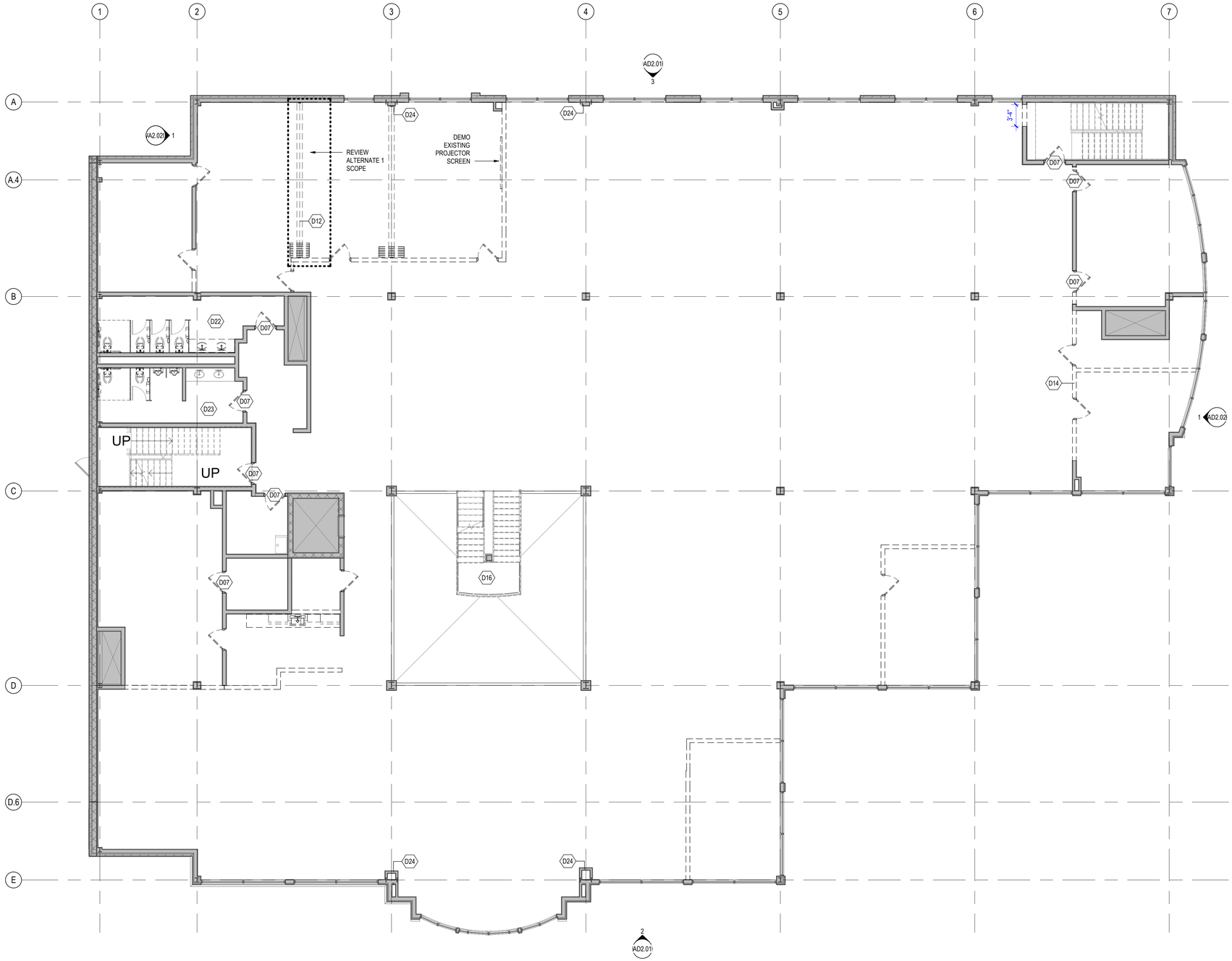

1 2ND FLOOR DEMOLITION PLAN
1/8" = 1'-0"

GENERAL DEMOLITION PLAN NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. EXISTING ROOM NUMBERS AND NAMES SHOWN ON DEMOLITION PLANS. SEE NEW WORK PLANS FOR NEW ROOM NUMBERS AND NAMES.
3. DASHED LINES INDICATE ITEMS TO BE REMOVED. PATCH AND REPAIR ALL ADJACENT SURFACES TO MATCH EXISTING SURFACE.
4. SEE ALL OTHER DISCIPLINES SHEETS FOR ADDITIONAL DEMOLITION.
5. REFER TO DEMOLITION REFLECTED CEILING AND DEMOLITION REFLECTED STRUCTURAL PLANS FOR ADDITIONAL DEMOLITION ITEMS.
6. REFER TO FLOOR PLANS AND INTERIOR ELEVATIONS FOR DIMENSIONS OF NEW OPENINGS NOT DIMENSIONS ON THE DEMOLITION SHEETS.
7. PROTECT ALL ITEMS / SURFACES "TO REMAIN" DURING DEMOLITION / CONSTRUCTION. REPAIR / REPLACE ALL ITEMS DAMAGED DURING DEMOLITION / CONSTRUCTION.
8. PATCH SURFACES TO MATCH ADJACENT SURFACES AT ALL REMOVED (ALL DISCIPLINES) DEVICES.
9. SURFACE TEXTURE OF ALL WALL PATCHES / INFILL TO MATCH ADJACENT EXISTING SURFACES BLEND NEW WALL TEXTURE INTO EXISTING WALL TEXTURE FOR UNIFORM FINISH / APPEARANCE. REPAINT ENTIRE WALL.
10. SEE DEMOLITION INTERIOR AND EXTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION.

DEMOLITION LEGEND:

- EXISTING GYPSUM BOARD / PLASTER CEILING TO REMAIN
- REMOVE EXISTING GYPSUM BOARD / PLASTER CEILING
- REMOVE EXISTING ACOUSTICAL CEILING TILE SYSTEM COMPLETE
- DEMOLISH EXISTING RAISED FLOOR SYSTEM COMPLETE

WALL LEGEND:

- EXISTING WALL
- NEW WALL CONSTRUCTION
- DEMO WALL

DEMOLITION KEYNOTES

#	DESCRIPTION
D01	DEMO ALL FLOOR FINISHES U.N.O.
D02	DEMO ALL CEILING TILE U.N.O.
D03	ESTIMATED CONC. SLAB DEMO AREA. COORDINATE WITH PLUMBING PLANS. SEE NOTE.
D07	DEMO EXISTING INTERIOR DOOR PANELS AND HARDWARE. EXISTING FRAMES TO REMAIN.
D08	SALVAGE CEILING MOUNTED TIME CAPSULE TO OWNER.
D09	DEMO RECEPTION COUNTER, BULKHEAD, & WALL BELOW.
D10	SALVAGE ALUM. STOREFRONT AND DOORS FOR REINSTALLATION.
D11	DEMO EXISTING VISUAL DISPLAY.
D12	ALT. 1 : EXISTING OPERABLE PARTITION TO REMAIN, PROTECT.
D13	SALVAGE EXISTING PROJECTION SCREEN TO OWNER.
D14	DEMO EXISTING H.M. FRAMES & TRANSOM WINDOWS ABOVE DOOR, & EXTENT OF EXISTING WALL BELOW.
D15	ALT. 1 : COMPLETELY REMOVE EXISTING WINDOW UNIT.
D16	DEMO EXISTING FLOOR FINISHES AT LANDINGS, TREADS, AND RISERS. CLEAN AND PREPARE ALL FLOOR SURFACES FOR NEW FINISHES.
D17	PROTECT EXISTING TILE FLOOR AND BASE.
D18	EXISTING OPERABLE PARTITION TO REMAIN, PROTECT.
D19	DEMO EXISTING CASEWORK, COUNTERTOP, AND SINK.
D20	REMOVE EXTERIOR CLADDING, PROTECT FOR REINSTALLATION. REMOVE EXISTING BACKUP ASSEMBLY TO PROVIDE ACCESS TO STRUCTURAL STEEL. REPLACE BACKUP MATERIAL CONSISTENT WITH ADJACENT. VERIFY WEATHER BARRIER CONTINUITY. REINSTALL EXTERIOR CLADDING.
D21	REVIEW SILLS WITH OWNER FOR DEMO AND REPLACEMENT
D22	DEMO COUNTERTOP, SINKS, TOILETS. PROTECT PARTITIONS.
D23	DEMO TOILETS, URINALS, FAUCETS. PROTECT PARTITIONS.
D24	DEMO WALLS AS REQUIRED TO COMPLETE STRUCTURAL MODIFICATIONS
D25	REMOVE EXISTING ROOF, INSULATION, AND ACCESSORIES COMPLETE TO STRUCTURAL DECK BELOW, PREPARE FOR NEW ROOFING

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR DEMOLITION PLAN

SHEET:
AD1.12

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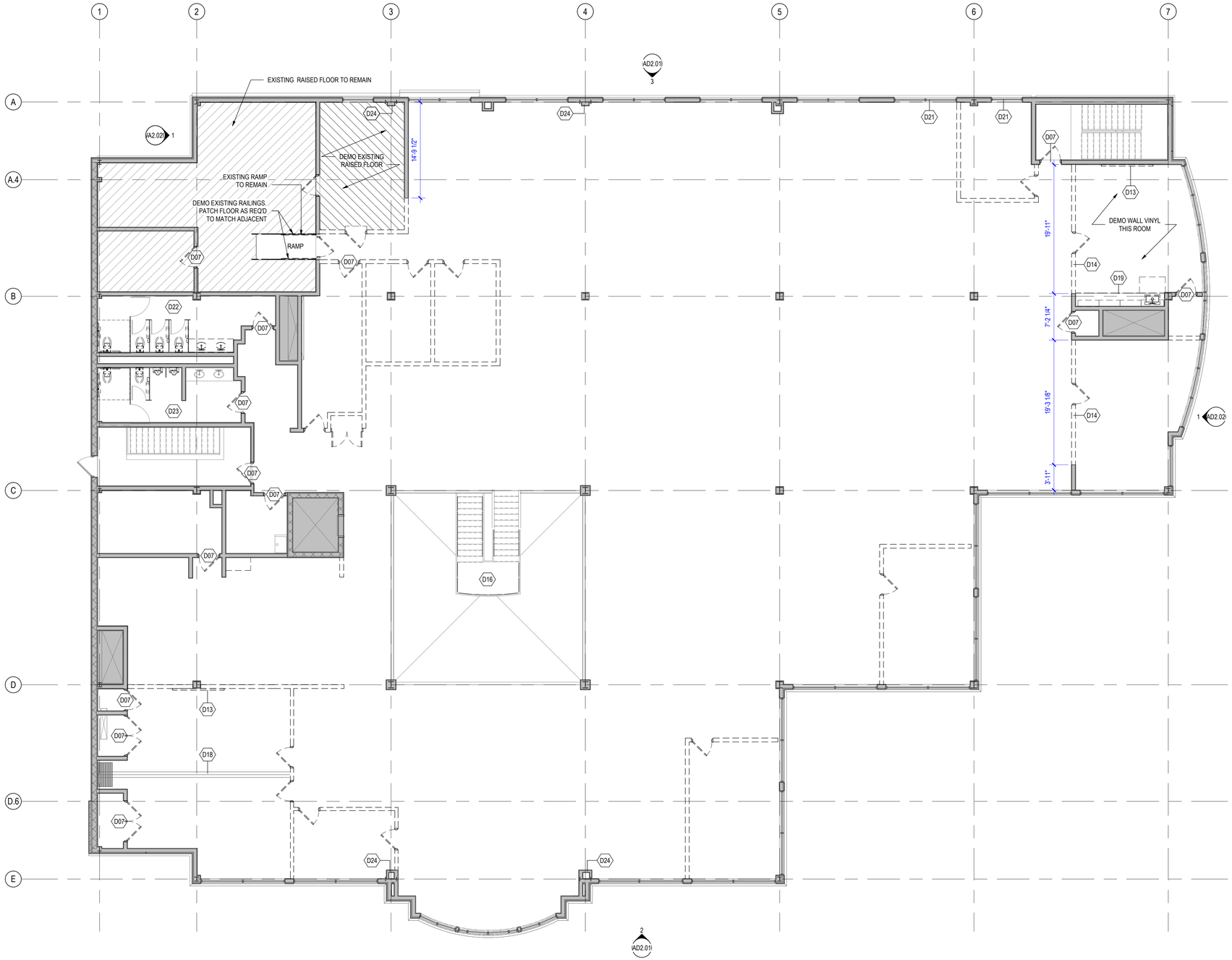

1 3RD FLOOR DEMOLITION PLAN
1/8" = 1'-0"

GENERAL DEMOLITION PLAN NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. EXISTING ROOM NUMBERS AND NAMES SHOWN ON DEMOLITION PLANS. SEE NEW WORK PLANS FOR NEW ROOM NUMBERS AND NAMES.
3. DASHED LINES INDICATE ITEMS TO BE REMOVED. PATCH AND REPAIR ALL ADJACENT SURFACES TO MATCH EXISTING SURFACE.
4. SEE ALL OTHER DISCIPLINES SHEETS FOR ADDITIONAL DEMOLITION.
5. REFER TO DEMOLITION REFLECTED CEILING AND DEMOLITION REFLECTED STRUCTURAL PLANS FOR ADDITIONAL DEMOLITION ITEMS.
6. REFER TO FLOOR PLANS AND INTERIOR ELEVATIONS FOR DIMENSIONS OF NEW OPENINGS NOT DIMENSIONS ON THE DEMOLITION SHEETS.
7. PROTECT ALL ITEMS / SURFACES "TO REMAIN" DURING DEMOLITION / CONSTRUCTION. REPAIR / REPLACE ALL ITEMS DAMAGED DURING DEMOLITION / CONSTRUCTION.
8. PATCH SURFACES TO MATCH ADJACENT SURFACES AT ALL REMOVED (ALL DISCIPLINES) DEVICES.
9. SURFACE TEXTURE OF ALL WALL PATCHES / INFILL TO MATCH ADJACENT EXISTING SURFACES BLEND NEW WALL TEXTURE INTO EXISTING WALL TEXTURE FOR UNIFORM FINISH / APPEARANCE. REPAINT ENTIRE WALL.
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- DEMOLISH EXISTING RAISED FLOOR SYSTEM COMPLETE

WALL LEGEND:

- EXISTING WALL
- NEW WALL CONSTRUCTION
- DEMO WALL

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NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR DEMOLITION PLAN

SHEET:
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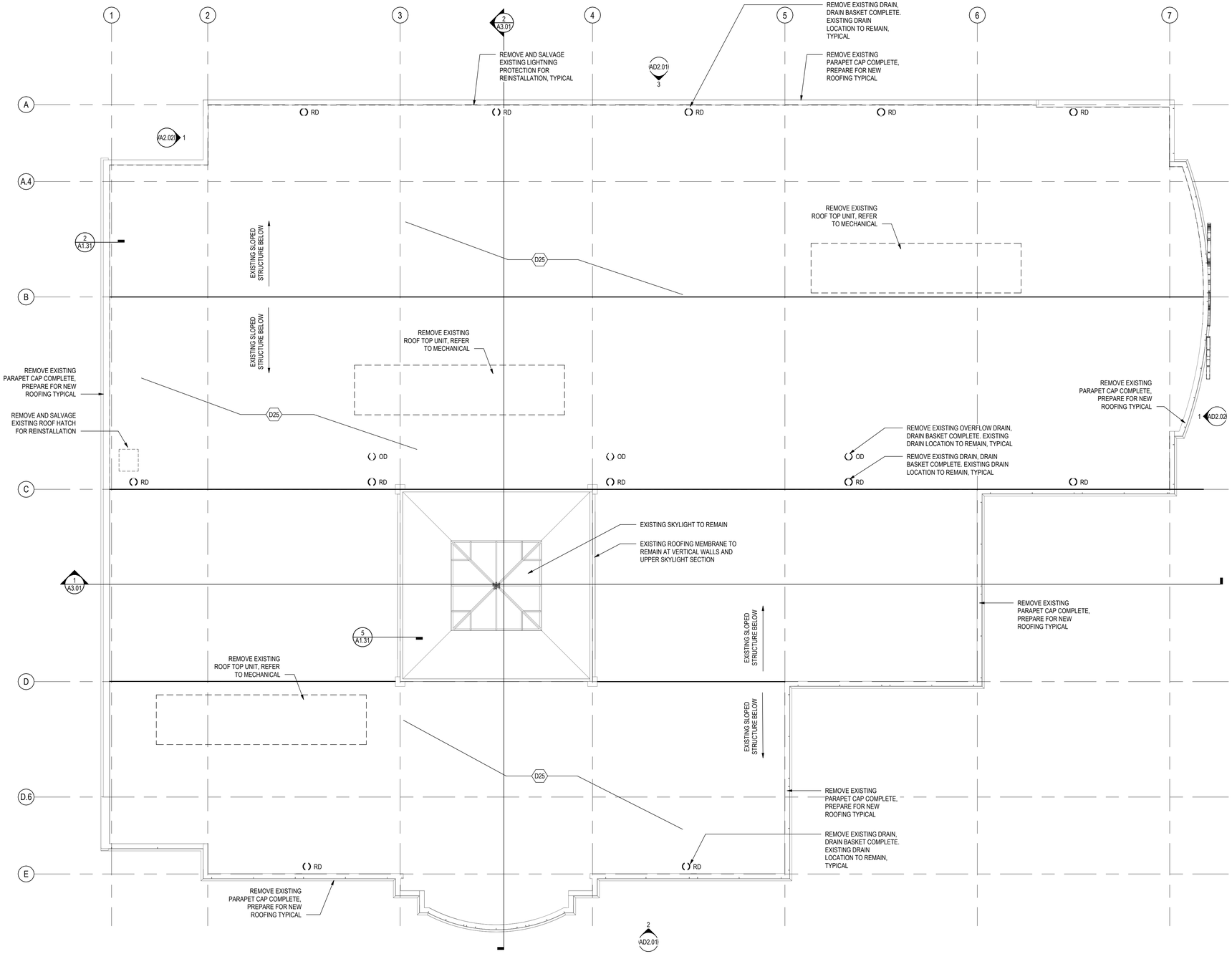

1 ROOF DEMOLITION PLAN
1/8" = 1'-0"

NORTH

ROOF DEMO NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. ROOF PLAN LAYOUT, LOCATIONS, SECTIONS AND DETAILS WERE TAKEN FROM EXISTING BUILDING PLANS AND FIELD OBSERVATIONS. THE CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS PRIOR TO THE START OF CONSTRUCTION .
3. EXISTING ROOFING SYSTEM ARE BELIEVED TO CONSIST OF THE FOLLOWING (ALL ROOF AREAS UNLESS NOTED OTHERWISE):
4. REFER TO MECHANICAL, PLUMBING, AND ELECTRICAL SHEETS FOR ADDITIONAL DEMOLITION NOTES.
5. PROTECT ALL ITEMS / SURFACES TO REMAIN DURING DEMOLITION / CONSTRUCTION. REPAIR / REPLACE ALL ITEMS / SURFACES DAMAGED DURING DEMOLITION / CONSTRUCTION TO MATCH EXISTING CONDITIONS.

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WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

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SHEET NAME:
ROOF DEMOLITION PLAN

SHEET:
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DEMOLITION LEGEND:

1. DASHED LINES INDICATE ITEMS TO BE REMOVED. PATCH AND REPAIR ALL ADJACENT SURFACES TO MATCH EXISTING SURFACES.
2. PROTECT ALL ELEMENTS TO REMAIN, TYPICAL.
3. REFER TO DEMOLITION PLANS AND RCPS FOR ADDITIONAL SCOPE OF WORK.
4. ANY RETURNS OR BLIND ELEVATIONS NOT SHOWN SHALL BE SIMILAR IN MATERIAL AND MAKEUP TO ADJACENT CONDITIONS OR OTHER SIMILAR CONDITIONS.

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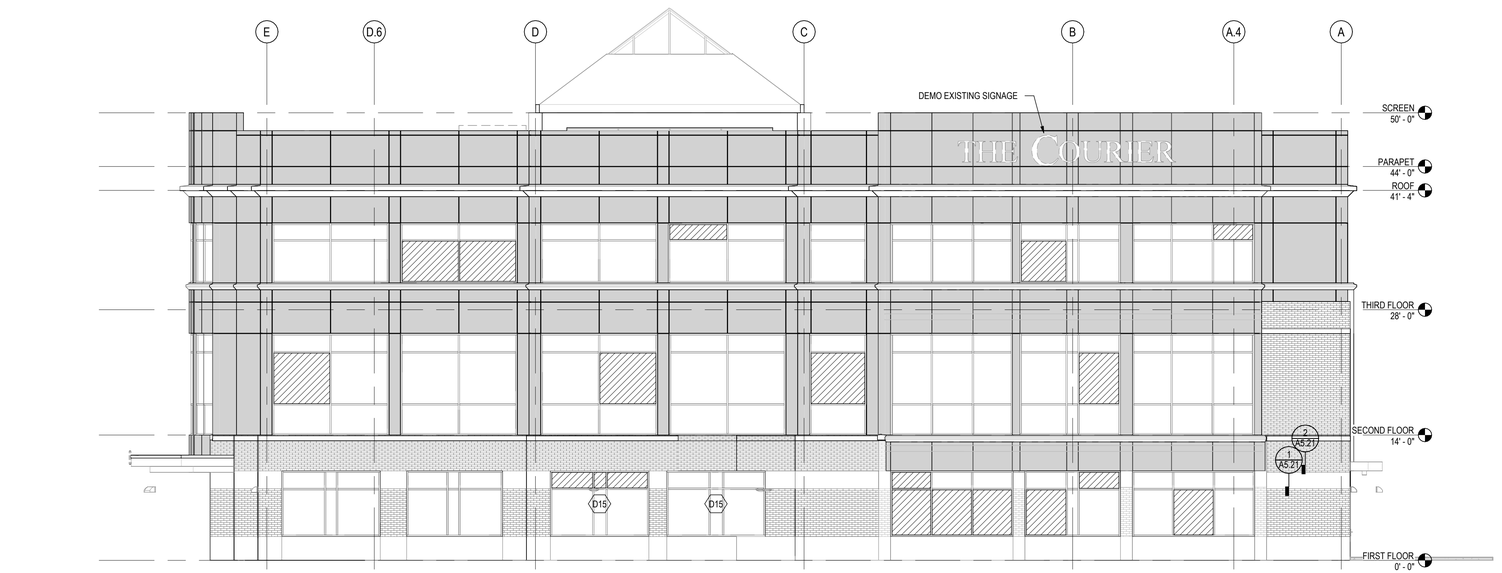
GLAZING REPLACEMENT:

ALL HATCHED GLAZING PANELS TO BE REPLACED WITH NEW IGU TO MATCH EXISTING



1 EXTERIOR DEMO ELEVATION - RIVER
1/8" = 1'-0"

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WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
EXTERIOR DEMO ELEVATIONS - RIVER

SHEET:
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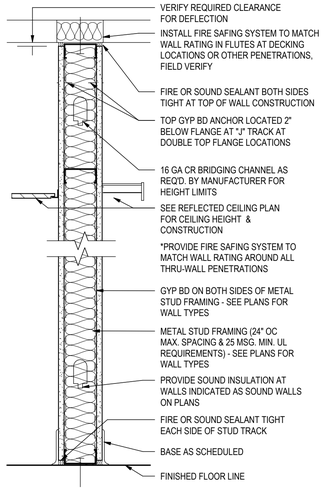
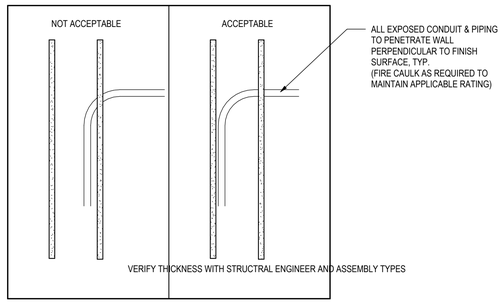


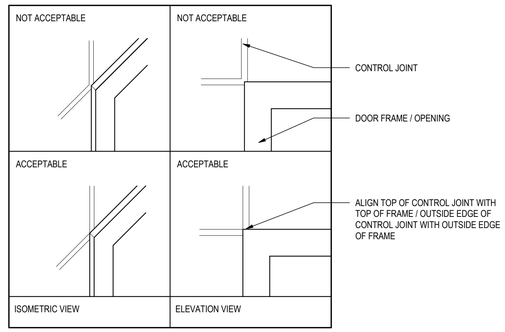
WALL SECTION DETAIL

1 1/2" = 1'-0"



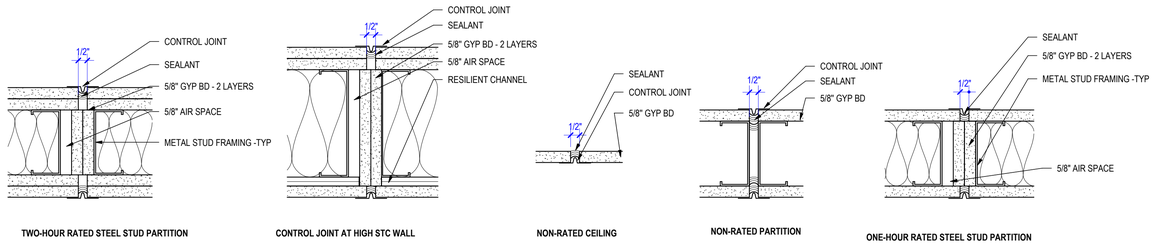
SECTION DETAIL AT WALL PENETRATIONS

1 1/2" = 1'-0"



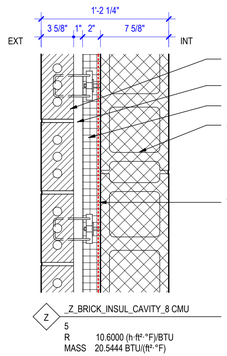
GYP WALL BOARD CONTROL JOINT DETAILS

1 1/2" = 1'-0"



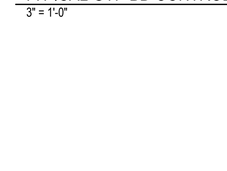
TYPICAL GYP BD CONTROL JOINTS

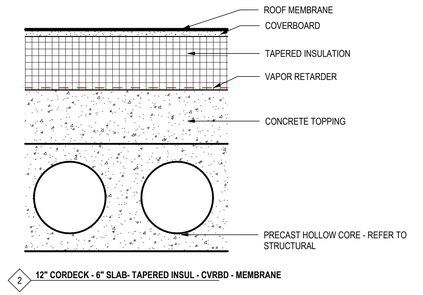
3" = 1'-0"

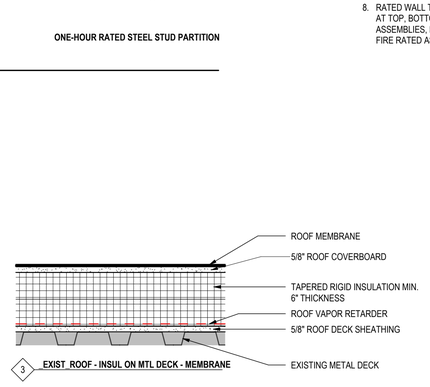


EXTERIOR WALL TYPES

1 1/2" = 1'-0" ALT. 1 ONLY

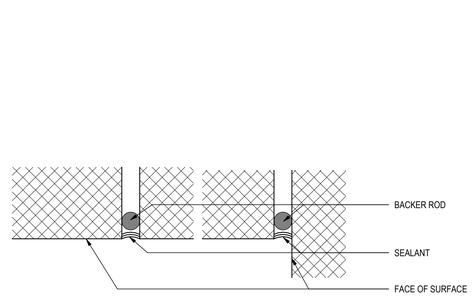






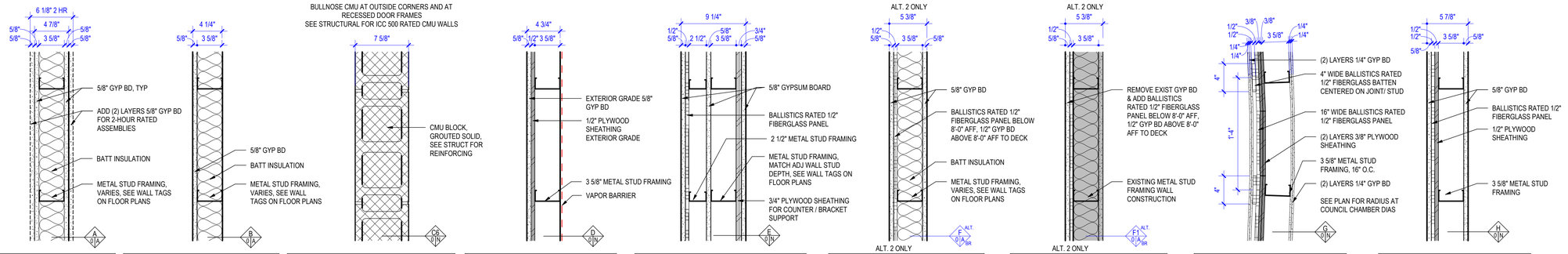
FLOOR & ROOF ASSEMBLIES

1 1/2" = 1'-0"



TYP. SEALANT JOINT

6" = 1'-0"



WALL TYPE A

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
A2-0-N	2 1/2"	3 3/4"	0			N
A-0-A	3 5/8"	4 7/8"	0	51		A
A-0-N	3 5/8"	4 7/8"	0			N
A-1-A	3 5/8"	4 7/8"	1	46	U419	A
A-1-N	3 5/8"	4 7/8"	1		U419	N
A-2-N	3 5/8"	6 1/8"	2		U419	N
A6-0-A	6"	7 1/4"	0	51		A
A6-0-N	6"	7 1/4"	0			N
A6-1-A	6"	7 1/4"	1		U419	A
A6-1-N	6"	7 1/4"	1		U419	N
A6-2-N	6"	8 1/2"	2			N
A8-0-N	8"	9 1/4"	0			N

WALL TYPE B

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
B2-0-N	2 1/2"	3 1/8"	0			N
B-0-A	3 5/8"	4 1/4"	0			A
B-0-N	3 5/8"	4 1/4"	0			N
B6-0-A	6"	6 5/8"	0			A
B6-0-N	6"	6 5/8"	0			N

WALL TYPE C

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
C6-0-N	0	5 5/8"	0		IBC Table 721.1	N
C8-0-N	0	7 5/8"	0		IBC Table 721.1	N
C8-2-N	0	7 5/8"	2		IBC Table 721.1	N

WALL TYPE D

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
D-0-N	3 5/8"	4 3/4"	0			N

WALL TYPE E

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
E-0-N	2 1/2"	9 1/4"	0			N
E6-0-N	6"	11 5/8"	0			N

WALL TYPE F

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
F-0-A	3 5/8"	5 3/8"	0	51		A
F-0-N	3 5/8"	5 3/8"	0			N
F6-0-A	6"	7 3/4"	0	51		A
F6-0-N	6"	7 3/4"	0			N

WALL TYPE F1

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
F1-0-A	3 5/8"	1 1/8"	0	51		A

WALL TYPE G

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
G-0-N	3 5/8"	6 3/8"	0	51		N

WALL TYPE H

TAG	STUD SIZE	WIDTH	FIRE RATING	STC	UL #	INSUL.
H-0-N	3 5/8"	5 7/8"	0	51		N

INTERIOR WALL TYPES

1 1/2" = 1'-0"

GENERAL WALL TYPE CONSTRUCTION NOTES:

1. SEE FLOOR PLANS FOR LOCATIONS OF WALL TYPES. NOT ALL WALLS ARE KEYED WITH TAGS. IF WALL TYPE IS IN QUESTION, CONTACT ARCHITECT FOR CLARIFICATION.

INTERIOR WALL TAGS



EXTERIOR WALL TAGS



WALL TYPE
X = 3 5/8" STUDS
X1 = 1 5/8" STUDS
X2 = 2-1/2" STUDS
X4 = 4" STUDS
X6 = 6" STUDS
X8 = 8" STUDS

FIRE RATING
0 - NON RATED
1 - 1 HOUR
2 - 2 HOUR
3 - 3 HOUR
B - SMOKE BARRIER
P - SMOKE PARTITION

INSULATION
A - ACOUSTICAL INSULATION
N - NO INSULATION
S - SPRAY FOAM INSULATION

ADDITIONAL COMMENTS
IR - IMPACT RESISTANT
MR - MOISTURE RESISTANT

2. TYPICAL WALL STYLE - UNLESS INDICATED OTHERWISE ON THE PLANS, THE STANDARD INTERIOR WALL TO BE USED IS: **A-0-A**, NON-RATED SOUND WALL.
3. WALL CONSTRUCTION - WALL TYPES DESCRIBE GENERAL CONSTRUCTION OF EACH ASSEMBLY. PROVIDE CONSTRUCTION PER NOTED FIRE RATED SYSTEMS, SOUND TEST RATINGS, & REFERENCED STANDARDS, OR APPROVED EQUALS.
4. WALL CONSTRUCTION COORDINATION - SEE STRUCTURAL FOR REINFORCING AT MASONRY & CONCRETE WALLS, AND FOR STUD SIZE & SPACING AT EXTERIOR & STRUCTURAL WALLS.
5. WALL HEIGHTS - ALL STRUCTURAL WALLS & WALLS WITH SMOKE, FIRE, OR SOUND RATINGS SHALL EXTEND TO THE ROOF OR FLOOR DECK ABOVE. OTHER WALLS SHALL EXTEND TO 6" ABOVE THE ADJACENT CEILING, OR FULL HEIGHT WHERE EXPOSED TO VIEW. WHERE WALLS DO NOT EXTEND TO DECK ABOVE, EXTEND FRAMING FULL HEIGHT OR BRACE WALLS TO MEET SPECIFIED DEFLECTION REQUIREMENTS.
6. SMOKE, FIRE, & SOUND RATED WALLS / ASSEMBLIES - CONSTRUCTION & PENETRATIONS TO BE GOVERNED BY MOST STRINGENT SEPARATION REQUIREMENT AS INDICATED IN DOCUMENTS.
7. RATED WALL CONTINUITY - RATED SEPARATIONS SHALL BE CONTINUOUS WITHOUT INTERRUPTION. WHERE ABUTTED BY NON-RATED CONSTRUCTION, RATED ASSEMBLIES SHALL BE CONSTRUCTED CONTINUOUS PRIOR TO INSTALLATION OF NON-RATED CONSTRUCTION.
8. RATED WALL TERMINATIONS - PROVIDE CONTINUOUS SEALANT BOTH SIDES OF WALLS AT TOP, BOTTOM, & CONNECTIONS TO OTHER MATERIALS. AT SOUND RATED ASSEMBLIES, PROVIDE SOUND INSULATION TO FILL VOIDS & ACOUSTICAL SEALANT. AT FIRE RATED ASSEMBLIES, PROVIDE UL TESTED SYSTEMS TO MAINTAIN RATINGS.
10. PENETRATIONS - SEAL ALL PENETRATIONS THROUGH & INTO WALLS. AT SOUND RATED ASSEMBLIES, PROVIDE ACOUSTICAL SEALANT. AT FIRE RATED ASSEMBLIES, PROVIDE UL TESTED PENETRATION SYSTEMS TO MAINTAIN RATINGS.
11. SEALANT & FIRE SAFING EXPOSED TO VIEW - WHERE SEALANTS & FIRE SAFING ASSEMBLIES ARE EXPOSED TO VIEW, PROVIDE PAINTABLE SEALANT - SEE FINISH SCHEDULE.
12. AT FRAMING CONNECTIONS TO COMPONENTS WITH SPRAY APPLIED FIRE PROOFING, PROVIDE REQUIRED STAND-OFF BRACKETS/CLIPS TO MAINTAIN RATINGS.
13. EXPANSION / CONTROL JOINTS - PROVIDE VERTICAL & HORIZONTAL JOINTS, PER SPECIFICATIONS, TO PREVENT CRACKS. NOT ALL JOINT LOCATIONS ARE SHOWN IN DRAWINGS.
14. TILE WALLS - INSTALL CEMENTITIOUS BACKER BOARD IN LIEU OF GYP BD ON AREAS OF WALLS CALLED OUT TO RECEIVE TILE. PROVIDE THICKNESS & FIRE RATING TO MATCH GYP BD CALLED OUT IN WALL TYPE.
15. MOISTURE RESISTANT GYP BD - PROVIDE MOISTURE RESISTANT GYP BD AT ALL WET LOCATIONS. ADDITIONAL LOCATIONS CALLED OUT IN SPECIFICATIONS.
16. WALL FACE ALIGNMENT - WHERE DIFFERENT WALL TYPES MEET AT LOCATIONS OTHER THAN CORNERS, MAINTAIN A FLUSH SURFACE CONTINUOUS BETWEEN WALLS, UNLESS SPECIFICALLY NOTED OTHERWISE.
17. CMU WALLS - THICKNESS OF CMU WALLS IS INDICATED ON PLANS, TO NOMINAL DIMENSIONS. BULLNOSE CMU AT ALL OUTSIDE CORNERS OF WALLS WHERE CMU IS EXPOSED. AT TILED WALLS, DO NOT BULLNOSE CMU; I.E. SHOWERS, TOILETS, LAVATORIES.
18. RECESSED BOXES OR EQUIPMENT BACK TO BACK IN SAME WALL CAVITY SHALL BE STAGGERED, UNLESS SPECIFICALLY NOTED TO BE INSTALLED BACK TO BACK. PROVIDE MINIMUM 3" OF ACOUSTIC INSULATION BETWEEN STAGGERED ITEMS.
19. CONCEALED WALL BACKING - ALL CONCEALED WOOD BLOCKING IN INTERIOR WALLS IS REQUIRED TO BE FIRE RETARDANT TREATED. PROVIDE CONCEALED BLOCKING OR BACKING FOR SURFACE MOUNTED CONSTRUCTION & EQUIPMENT, WHETHER IN CONTRACT OR OWNER SUPPLIED. CONTRACTOR TO VERIFY OWNER SUPPLIED EQUIPMENT SUCH AS, BUT NOT LIMITED TO, BREAK ROOM ACCESSORIES, TOILET ACCESSORIES, FURNITURE, ARTWORK, MEDICAL EQUIPMENT, TVS, PROJECTION SCREENS, ETC. CONTRACTOR SHALL VERIFY WITH OWNER AND/OR OWNERS AGENT PRIOR TO BIDDING IF APPLICABLE.
20. PROVIDE SIGNAGE / STENCILING ABOVE CEILING AT ALL RATED WALLS INDICATING FIRE RESISTANCE RATING. SEE SPEC SECTION 092100 FOR ADDITIONAL INFORMATION ON SIGNAGE REQUIREMENTS AND INSTALLATION LOCATIONS.
21. ELECTRICAL ROOM BACKING - ATTACH 1/2" FIRE RESISTANT PLYWOOD STARTING AT 4" AND ENDING AT 8'-4" AFF AT ALL ELECTRICAL, MDF, & I.D.F. TELECOM. ROOMS.

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CONSULTANT:
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IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: WALL TYPES, ASSEMBLIES, DETAILS

SHEET: A0.01

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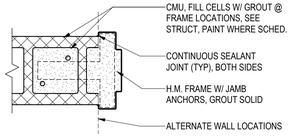
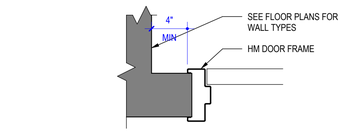
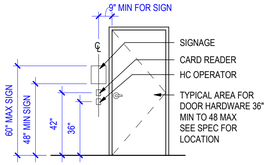


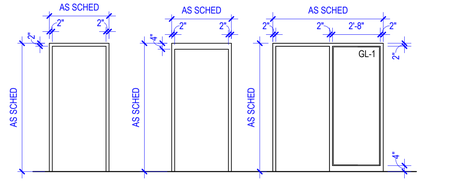
HM JAMB @ CMU
1 1/2" = 1'-0"



TYPICAL DOOR JAMB LOCATION
1 1/2" = 1'-0"

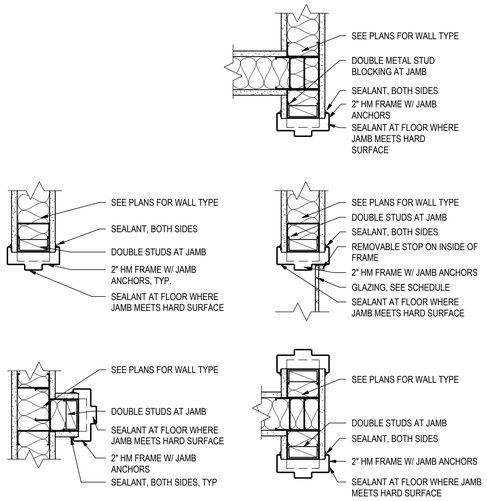


DOOR HARDWARE AND DEVICE ELEVATION
1/4" = 1'-0"



NOTE: FRAME TYPE 3 LOCATIONS AFFECTED BY ALTERNATE 2 TO RECEIVE BR-1 GLAZING UNDER ALTERNATE

DOOR FRAME ELEVATIONS
1/4" = 1'-0"



TYP STUD WALL - HM JAMB DETAILS
1 1/2" = 1'-0"

GLAZING NOTES:

1. PROVIDE SAFETY GLAZING CONSISTENT WITH APPLICABLE CODE AS MINIMUM REQUIREMENT.
2. PROJECT MAY INCLUDE SAFETY GLAZING IN LOCATIONS THAT EXCEED CODE REQUIREMENTS. SEE OPENING SCHEDULE, ELEVATIONS AND SPECIFICATION FOR LOCATIONS AND TYPES.
3. ¼" SAFETY GLASS IS THE MINIMUM REQUIREMENT FOR GLAZIING IN DOORS AND FRAMES.
4. GLASS THICKNESS IS TO BE BASED ON THE PANEL SIZE AND NUMBER OF ENCAPSULATED SIDES OF THE PANEL. SEE SPECIFICATION.
5. INSTALL FIRE RATED GLASS AT ALL RATED DOOR/FRAME AND WALL OPENINGS. RATING TO BE COMPLIANT WITH APPLICABLE CODE. SEE OPENING SCHEDULE AND LIFE SAFETY SHEETS. FIRE RATED GLAZING MUST INCLUDE MARKING AS REQUIRED BY CODE.
6. NO WIRE GLASS ALLOWED ON THE PROJECT.
7. INSULATED GLAZING UNITS ARE REQUIRED AT ALL EXTERIOR FENSTRATION.
8. GLASS BUTT JOINTS AT INTERIOR GLAZING TO HAVE COPOLYMER STRIPS. APPLIED SEALANT IS NOT ACCEPTABLE. COORDINATE SIZE WITH REQUIRED GLASS THICKNESS.

GLAZING TYPES:

1. GL-1 : 1/4" MONOLITHIC CLEAR TEMPERED GLASS
2. GL-2: 1/2" MONOLITHIC CLEAR TEMPERED GLASS AT COUNCIL DIAS RAILING
3. IGU-1: MATCH EXISTING FOR REPLACEMENT LOCATIONS
4. LSG-1 : GLASS CLAD POLYCARBONATE SECURITY GLAZING
5. ICC-1 : ICC 500 RATED GLAZING IN ALT. 1 EXTERIOR WINDOW ASSEMBLY
6. BR-1 : BULLET RESISTANT GLAZING

FRAME TYPES:

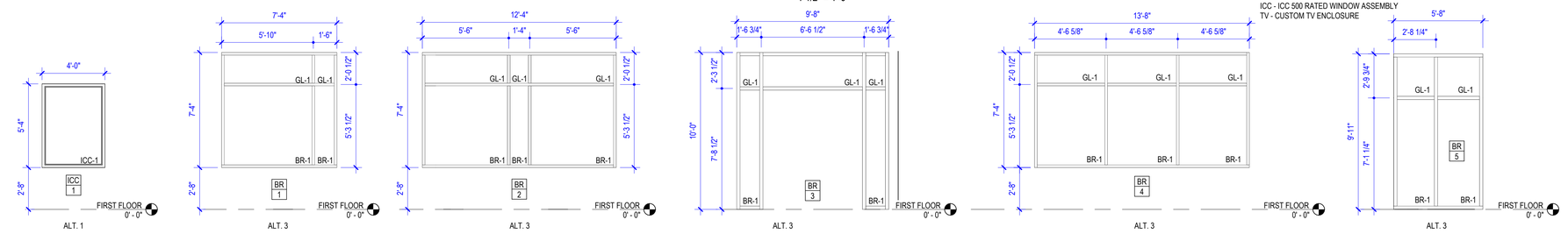
BT - BALLISTIC RATED TRANSACTION INTERIOR ASSEMBLY
BR - BALLISTIC RATED EXTERIOR WINDOWS
HM - HOLLOW METAL FRAME
SF - ALUMINUM STOREFRONT FRAME
ICC - ICC 500 RATED WINDOW ASSEMBLY
TV - CUSTOM TV ENCLOSURE

GENERAL DOOR AND FRAME NOTES:

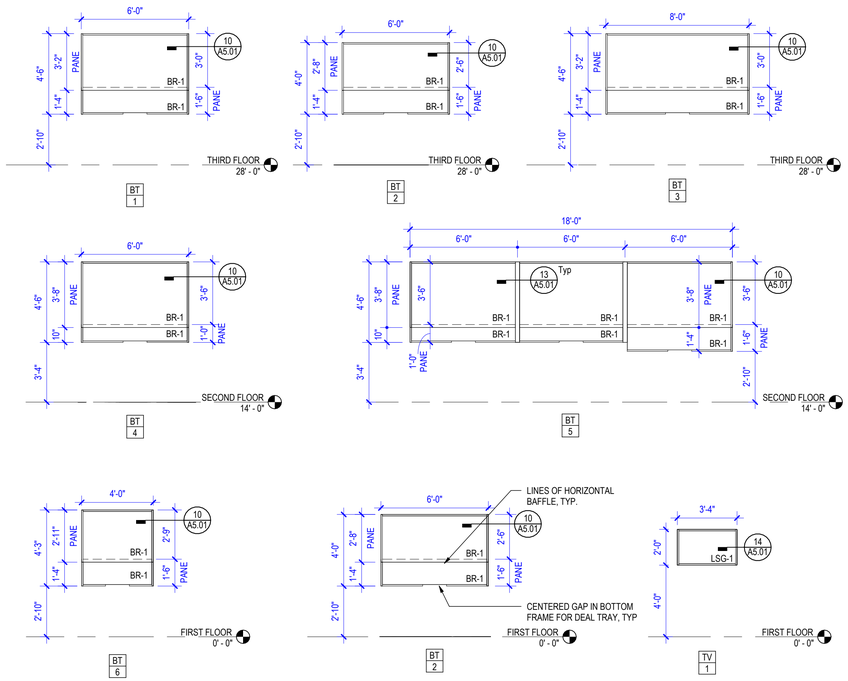
1. OPENING HEIGHTS AND WIDTHS ARE SHOWN IN OPENING SCHEDULE OR FRAME ELEVATIONS.
2. DIMENSIONS SHOWN ARE ROUGH-OPENING SIZES. CONTRACTOR IS REQUIRED TO FIELD VERIFY AND FABRICATE ACCORDINGLY TO FIT ROUGH OPENING AND INSTALLATION NEEDS.
3. ALL HOLLOW METAL FRAMES AND HOLLOW METAL DOORS ARE TO BE PAINTED UNLESS NOTED OTHERWISE.
4. NOT ALL DOOR OPENINGS ARE DIMENSIONED ON THE PLANS. DOORS LOCATED NEXT TO PERPENDICULAR WALLS SHALL BE INSTALLED SUCH THAT THE DOOR, WHEN IN THE FULLY OPEN POSITION AGAINST THE WALL STOP, IS PARALLEL TO THE PERPENDICULAR ADJACENT WALL. COORDINATE WITH DOOR HARDWARE. MINIMUM DISTANCE FROM ADJACENT WALL IS 4 " UNLESS NOTED OTHERWISE.
5. CONSULT ARCHITECT IF DOOR OR WINDOW OPENING LOCATION IS NOT DIMENSIONED OR APPEARS TO BE MORE THAN 4 " AWAY FROM ADJACENT WALL.
6. HOLLW METAL FRAMES INSTALLED IN MASONRY WALLS AND STUD WALLS WITH GYPSUM WALL PANELS SHALL BE PROVIDED SUCH THAT THE THROAT DEPTH ENCAPSULATES THE FULL WALL THICKNESS.
7. THROAT DEPTH OF HOLLOW METALS FRAMES SHALL BE ADJUSTED TO INCLUDE THE DEPTH OF APPLIED WALL FINISHES SUCH AS TILE, UNLESS NOTED OTHERWISE.
8. SEE OPENING SCHEDULE FOR DOOR, FRAME AND WINDOW FRAME COLORS AND MATERIALS.
9. ALL DOORS ARE TO BE 1 ¾ " THICK UNLESS NOTED OR SCHEDULED OTHERWISE.
10. SEE SPECIFICATON FOR SPECIFIC KEYING INFORMATION. KEYING MUST BE MATCH OWNER EXISTING SYSTEM.
11. ACCESS DOORS MUST BE PROVIDED FOR ACCESS TO MECHANICAL WORK, INCLUDING BUT NOT LIMITED TO: ALL CONCEALED VALVES, DAMPER CONTROLS, FIRE DAMPERS, ELECTRICAL JUNCTION BOXES AND OTHER ITEMS. REFER TO SPECIFICATIONS AND MEPT DOCUMENTS. CONTRACTOR TO CONSULT WITH DESIGN TEAM FOR EXACT LOCATIONS AND ELEMENTS THAT REQUIRE ACCESS. OBTAIN ARCHITECT APPROVAL OF LOCATION PRIOR TO INSTALLATION.
12. STANDARD TYPICAL DETAILS ARE SHOWN ON A0 SHEETS. UNIQUE DETAILS ARE IDENTIFIED ON FLOOR PLANS, AND ELEVATION SHEETS.
13. FINISH PLAN MAY INCLUDE ADDITIONAL INFORMATION REGARDING DOORS ARE FRAMES.
14. GL-1 GLAZING TYPE IN BALLISTIC RATED FRAMES NOT PROVIDED BY BALLASTIC FRAME & GLAZING MANUFACTURER.

GENERAL EXTERIOR DOOR, FRAME, AND WINDOW NOTES:

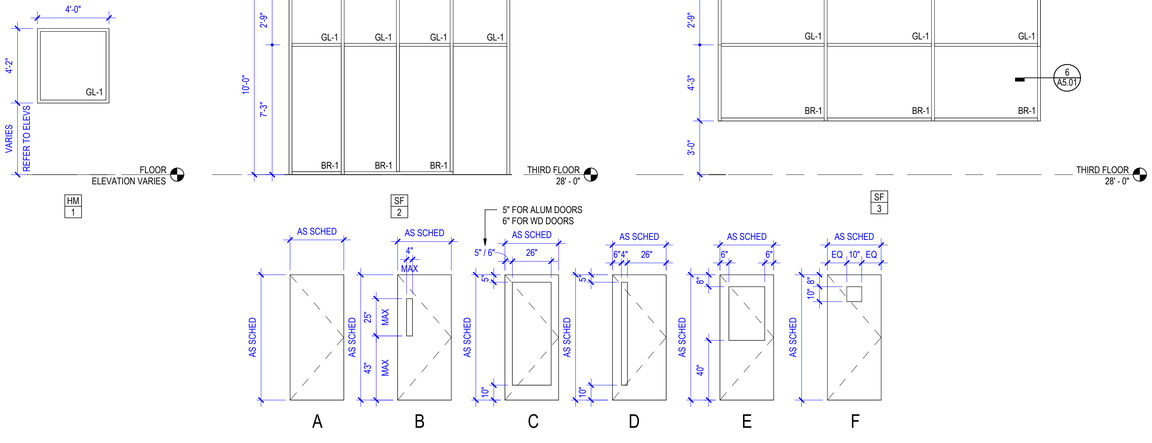
1. OPENING HEIGHT AND WIDTH ARE SHOWN IN OPENING SCHEDULE.
2. DIMENSIONS SHOWN ON PLANS OR ELEVATIONS ARE ROUGH-OPENING SIZES. CONTRACTOR IS REQUIRED TO FIELD VERIFY AND FABRICATE ACCORDINGLY TO FIT ROUGH OPENING.
3. SEE OPENING SCHEDULE FOR DOOR, FRAME AND WINDOW FRAME COLORS AND MATERIALS.
4. DOOR HARDWARE AND TRIM COLOR IS REQUIRED TO MATCH THE SPECIFIED COLOR OF THE EXTERIOR DOORS AND FRAMES UNLESS NOTED OTHERWISE.
5. ALL EXTERIOR HOLLOW METAL DOORS AND FRAMES ARE TO BE THERMALLY BROKEN.
6. FINISH PLAN MAY INCLUDE ADDITIONAL INFORMATION REGARDING DOORS ARE FRAMES.



EXTERIOR GLAZING ELEVATIONS
1/2" = 1'-0"



INTERIOR GLAZING ELEVATIONS
1/4" = 1'-0"



DOOR TYPE ELEVATIONS
1/4" = 1'-0"

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Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: OPENING ELEVATIONS & DETAILS

SHEET: A0.02

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DOOR SCHEDULE

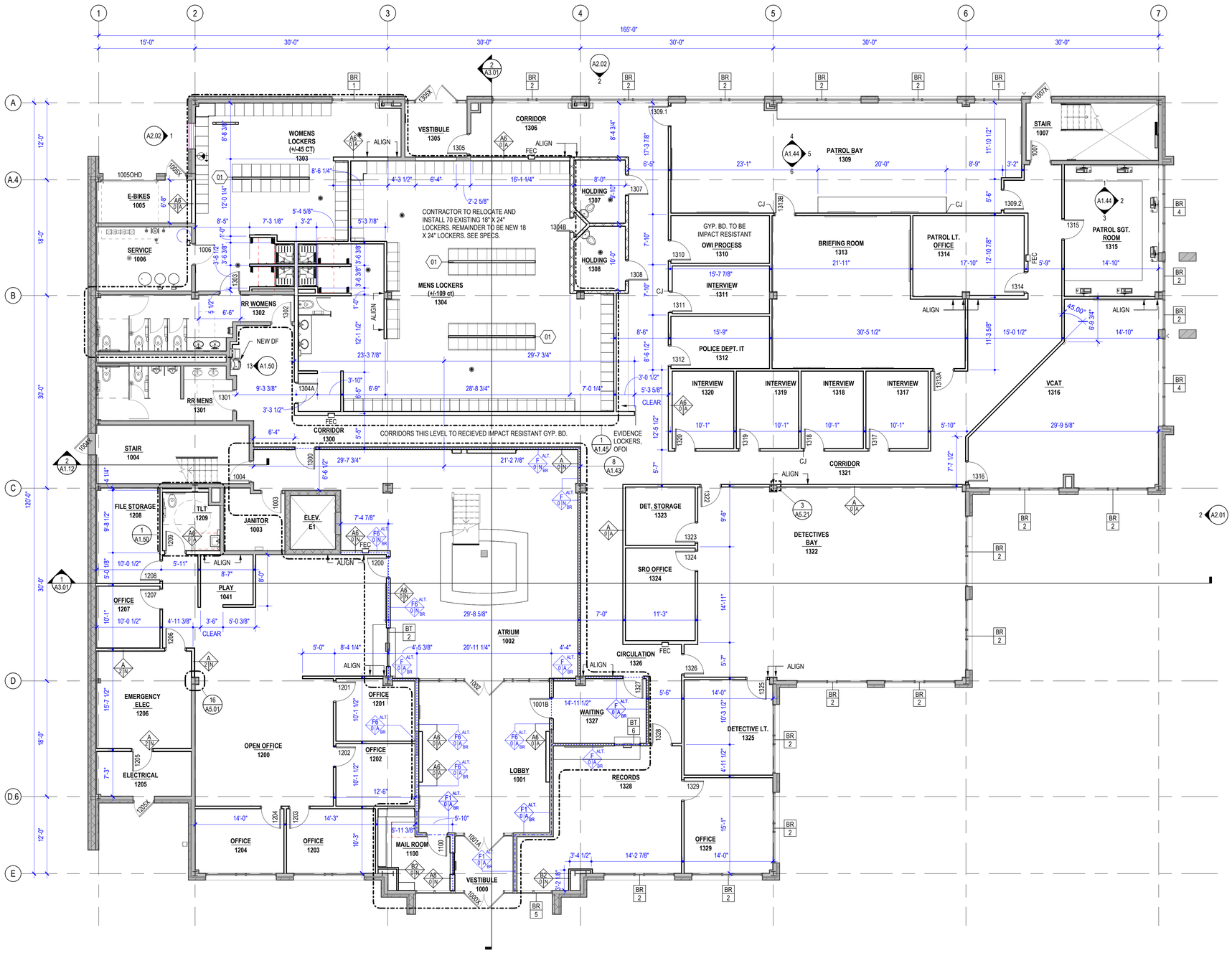
TAG	ROOM NAME	DESCRIPTION	EXISTING/NEW	DOORS					FRAME					FIRE RATING (MIN)	CARD READER	AUTOMATIC OPERATOR	COMMENTS	ALT #2
				TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH					
1000X	VESTIBULE	DOUBLE	Existing	C	6'-0"	7'-0"	ALUM	ANOD EXIST.		--	--	ALUM	ANOD		■	■		
1001A	LOBBY	DOUBLE	Existing	C	6'-0"	7'-0"	ALUM	ANOD EXIST.		--	--	ALUM	ANOD		■	■		
1001B	WAITING	SINGLE	New Construction	C	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
1002	ATRIUM	DOUBLE	Existing	C	6'-0"	7'-0"	ALUM	ANOD EXIST.		--	--	ALUM	ANOD		■	■		
1003	JANITOR	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2	45 MIN	■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
1004	STAIR	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■	■	EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
1004X	STAIR	SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2		■	■		
1005OHD	E-BIKES	SECTIONAL OVERHEAD DOOR	Existing		8'-4"	7'-0"				0"	0"						OVERHEAD DOOR	
1005X	E-BIKES	SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2		■			
1006	SERVICE	SINGLE	Existing	A	3'-0"	7'-0"	HM	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
1007	STAIR	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
1007X	STAIR	SINGLE	Existing	A	3'-0"	7'-10"	HM	PT2	1	3'-4"	8'-0"	HM	PT2		■			
1100	MAIL ROOM	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2		■			ALT #2
1200	OPEN OFFICE	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
1201	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1202	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1203	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1204	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1205	ELECTRICAL	SINGLE	New Construction	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2	90 MIN				
1205X	ELECTRICAL	SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2					
1206	EMERGENCY ELEC	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2	90 MIN				
1207	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1208	FILE STORAGE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1209	TLT	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1300	ATRIUM	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
1301	RR MENS	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
1302	RR WOMENS	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
1303	WOMEN'S LOCKER RR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1304A	MEN'S LOCKER RR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1304B	MENS LOCKERS (+/-109 ct)	SINGLE	New Construction	A	2'-0"	6'-6"	HM	PT2	1	2'-4"	6'-8"	HM	PT1					
1305	CORRIDOR	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2			■		
1305X	VESTIBULE	DOUBLE	Existing	C	6'-4"	7'-7 1/4"	ALUM	ANOD EXIST.		--	--	ALUM	ANOD		■	■	5TH STREET EXTERIOR	
1307	HOLDING	SINGLE	New Construction	F	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2				DETENTION GRADE	
1308	HOLDING	SINGLE	New Construction	F	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2				DETENTION GRADE	
1309.1	PATROL BAY	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1309.2	PATROL BAY	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1310	OWI PROCESS	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1311	INTERVIEW	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1312	POLICE DEPT. IT	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
1313A	BRIEFING ROOM	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1313B	BRIEFING ROOM	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1314	PATROL LT. OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1315	PATROL SGT. ROOM	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1316	VCAT	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
1317	INTERVIEW	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1318	INTERVIEW	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1319	INTERVIEW	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1320	INTERVIEW	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1322	DETECTIVES BAY	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
1323	DET. STORAGE	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1324	SRO OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1325	DETECTIVE LT.	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
1326	DETECTIVES BAY	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
1327	WAITING	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
1328	RECORDS	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
1329	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
E1	ELEV.	ELEVATOR	Existing		3'-0"	7'-0"											ELEVATOR DOOR	
2001	POLICE STORAGE	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2002	CIRCULATION	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
2003	JANITOR	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2		■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2004	STAIR	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2004AX		SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2		■			
2004BX		SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2		■			
2005	RR MENS	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2006	RR WOMENS	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2007A	STAIR	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■			
2007B	STAIR	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2008A	ELECTRICAL/IT STORAGE	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
2101	POLICE BREAK	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2	45 MIN				
2102A	TRAINING	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2	45 MIN				
2102B	TRAINING	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2	45 MIN				
2103	PATROL CAPT.	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2104	DET CAPT.	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2105	ADMIN CAPT.	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2106	CHIEF OFFICE	SINGLE	New Construction	E	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2107	INTERNAL AFFAIRS	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
2108	FINANCE CLERK	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2110	TRAINING LT.	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2111	PD RR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2112	PD RR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2113	POLICE CONFERENCE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2114	TRAINING OFFR.	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2200A	PLANNING & ENGINEERING DEPARTMENT	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
2200B	PLANNING & ENGINEERING DEPARTMENT	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
2201	OFFICE	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2202	OFFICE	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2203	CLOSET	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2204	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2205	CLOSET	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2206	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2207	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2208	PRINT ROOM	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2210	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2211	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					

DOOR SCHEDULE

TAG	ROOM NAME	DESCRIPTION	EXISTING/NEW	DOORS					FRAME					FIRE RATING (MIN)	CARD READER	AUTOMATIC OPERATOR	COMMENTS	ALT #2
				TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH					
2212	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2214	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2215	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2216	CONFERENCE	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2217	STAFF BREAK	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2218	FILE VAULT	SINGLE	New Construction	A	3'-8"	7'-0"	WD	WD1	1	4'-0"	7'-2"	HM	PT2	45 MIN				
2219	ELEV. MECH	SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
2220	ENGINEERING VAULT	SINGLE	New Construction	A	3'-8"	7'-0"	HM	PT2	1	4'-0"	7'-2"	HM	PT2	45 MIN				
2221	CIRCULATION	SINGLE	New Construction	D	3'-8"	7'-0"	WD	WD1	1	4'-0"	7'-2"	HM	PT2		■			ALT #2
2222A	BUILDING INSPECTIONS	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
2222B	BUILDING INSPECTIONS	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
E2	ELEV.	ELEVATOR	Existing		3'-0"	7'-0"											ELEVATOR DOOR	
3002	RR WOMENS	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3003	RR MENS	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3004	STAIR	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3004X	STAIR	SINGLE	Existing	A	3'-0"	7'-0"	HM	PT2	1	3'-4"	7'-2"	HM	PT2		■			
3005	JANITOR	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2		■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3006	CORRIDOR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
3007	STAIR	SINGLE	Existing	B	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2	45 MIN	■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3100	IT CORRIDOR	SINGLE	New Construction	C	3'-0"	7'-0"	WD	WD1	1	6'-2"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
3101	ELECTRICAL/IT	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2		■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3102	CONTROL ROOM	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3103	CABLE STUDIO	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3104	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3105	STORAGE	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3106	IT OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3107	IT OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3108	CABLE ACCESS OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3109	CABLE ACCESS OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3200	CLERKS & FINANCE	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2			■	CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
3201	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3202	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3203	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3204	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3205	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3206	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3207	H.R. OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3208A	CONF.	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3208B	CONF.	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2			■		ALT #2
3209	STORAGE	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2			■		
3210	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3211	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3212	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3300	WAITING	SINGLE	New Construction	C	3'-0"	7'-0"	WD	WD1	1	6'-2"	7'-2"	HM	PT2		■		CR ACTIVE AFTER BUSINESS HOURS	ALT #2
3301A	MAYORS OFFICE	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	6'-2"	7'-2"	HM	PT2					
3301B	MAYORS OFFICE	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3302	WAITING	SINGLE	New Construction	C	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
3304	CITY MANAGER/CONFERENCE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3305	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3306	CLOSET	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3307	MEETING ROOM	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3308	CIRC	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
3309	RR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3310	RR	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3311	WELLNESS	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3400A	OPEN OFFICE	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
3400B	OPEN OFFICE	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■		CR LINKED WITH RECEPTION DESK PUSH BUTTON	ALT #2
3401	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3402	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3403	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3404	OFFICE	SINGLE	New Construction	B	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2					
3600A	LARGE CONF. ROOM	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
3600B	LARGE CONF. ROOM	SINGLE	New Construction	A	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			
3601	COUNCIL CHAMBERS	SINGLE	New Construction	C	3'-0"	7'-2"	ALUM	ANOD		--	--	ALUM	ANOD		■	■		
3602A	STOR.	DOUBLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	6'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3602B	STOR.	DOUBLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	6'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3602C	STOR.	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2				EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
3602D	MOLLENHOFF CONF.	Folding Partition	New Construction															
3602E	MOLLENHOFF CONF.	Folding Partition	Existing															
3603	BREAK ROOM	SINGLE	New Construction	D	3'-0"	7'-0"	WD	WD1	1	3'-4"	7'-2"	HM	PT2		■			ALT #2
3604	LOCKED STORAGE	SINGLE	Existing	A	3'-0"	7'-0"	WD	WD1	EX	3'-4"	7'-2"	HM	PT2		■		EXISTING FRAME TO REMAIN. INSTALL NEW PANEL AND HARDWARE.	
E3	ELEV.	ELEVATOR	Existing		3'-0"	7'-0"											ELEVATOR DOOR	

DOOR SCHEDULE - ALTERNATE 1

TAG	ROOM NAME	DESCRIPTION	EXISTING/NEW	DOORS					FRAME					FIRE RATING (MIN)	CARD READER	AUTOMATIC OPERATOR	COMMENTS	ALT #2
				TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH					
1330	STORM SHELTER CORRIDOR	SINGLE	Add. Alt. 1 - Storm Shelter	A	3'-0"	7'-0"	HM	WD1	2	3'-4"	7'-2"	HM	PT2	90 MIN			STORM RATED	
1330X	STORM SHELTER/BREAK ROOM	SINGLE	Add. Alt. 1 - Storm Shelter	A	3'-0"	7'-10"	HM	PT2	2	3'-4"	8'-0"	HM	PT2				STORM RATED	
1331	RR	SINGLE	Add. Alt. 1 - Storm Shelter	A	3'-0"	7'-0"	WD	WD1	2	3'-4"	7'-2"	HM	PT2					
1332	RR	SINGLE	Add. Alt. 1 - Storm Shelter	A	3'



1 1ST FLOOR PLAN
1/8" = 1'-0"

TRUE NORTH
PLAN NORTH

FEET: 0 1 2 4 8 16 24
1/8"=1'-0"

GENERAL EXISTING FLOOR PLAN NOTES:

1. SHADED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. ALL WALLS WITH SOUND BATT ATTENUATION BLANKETS ARE TO HAVE ACOUSTICAL SEALANT AT TOP AND BOTTOM. SEE WALL TYPES FOR ADDITIONAL REQUIREMENTS.
3. FACE OF NEW WALLS TO ALIGN WITH FACE OF EXISTING ADJACENT WALL, UNLESS NOTED OTHERWISE.
4. WALL INFILL AT EXISTING WALLS SHALL BE SIZED TO MATCH EXISTING WALLS FACE OF NEW FINISH TO BE FLUSH WITH EXISTING FINISHED FACE ON EACH SIDE OF WALL.
5. SEE EXTERIOR AND INTERIOR ELEVATIONS FOR FURTHER CLARIFICATION OF MATERIALS / LOCATIONS / FINISHES.

GENERAL FLOOR PLAN NOTES:

1. REFER TO ADDITIONAL NOTES AND REQUIREMENTS ON ALL OTHER DOCUMENTS, OTHER DISCIPLINES AND SPECIFICATIONS.
2. ALL SITE INFO, FIXTURES AND EQUIPMENT SHOWN ON THIS SHEET IS PROVIDED FOR COORDINATION PURPOSES ONLY. THE LAYOUT IS CONSIDERED CONCEPTUAL. REFER TO CIVIL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE SPRINKLER, LIFE-SAFETY, ETC. DOCUMENTS FOR SPECIFIC DESIGN INFORMATION.
3. ALL CONDUITS, PIPES, SPRINKLER MAINS SHOULD BE HELD AS TIGHT AS POSSIBLE TO THE ROOF OR FLOOR DECK ABOVE. NOTHING SHALL BE BELOW THE BOTTOM EDGE OF THE STRUCTURE UNLESS PRIOR APPROVAL IS GRANTED BY THE ARCHITECT OR OWNER. ABSOLUTELY NO OBSTRUCTIONS SHALL PREVENT A FINISHED CEILING HEIGHT NOTED ON THE DRAWINGS IN THOSE AREAS RECEIVING CEILING TREATMENT. PLACEMENT COORDINATION BETWEEN TRADES IS REQUIRED.
4. CAULK & SEAL ALL CONTROL-EXPANSION, SAWCUT JOINTS AT ALL INTERIOR & EXTERIOR MASONRY & CONCRETE. PROVIDE CONSTRUCTION AND CONTROL JOINTS IN CONCRETE SLABS ON GRADE AS SHOWN OR DETAILED ON STRUCTURAL DRAWINGS, IF NOT SHOWN, PROVIDE JOINTING PLAN
5. REGLUE EXISTING WALL VINYL IN ALL EXISTING MULTISTALL RESTROOMS.

WALL LEGEND:

- EXISTING WALL
- NEW WALL CONSTRUCTION
- DEMO WALL
- ALT. 2 WALLS TO RECEIVE BALLISTICS RESISTANT PANEL
- EXISTING WALLS UNDER ALT. 2 TO RECEIVE BALLISTICS RESISTANT PANEL

KEYNOTES

#	DESCRIPTION
01	INTERIOR WALL AT INSTANCES OF LOCKER ISLANDS TO BE FINISHED WITH METAL PANEL END CAP UP TO FULL HEIGHT OF LOCKER UNIT. WALL ABOVE LOCKER UNIT TO BE GYP BD WRAP WITH EPOXY PT FINISH.

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Description	Date	No.

OWNER SIGN-OFF:
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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102
DATE: 8/26/2026
SHEET SET: BID DOCUMENTS
SHEET NAME: FIRST FLOOR PLAN
SHEET: A1.11

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GENERAL EXISTING FLOOR PLAN NOTES:

1. SHADED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. ALL WALLS WITH SOUND BATT ATTENUATION BLANKETS ARE TO HAVE ACOUSTICAL SEALANT AT TOP AND BOTTOM. SEE WALL TYPES FOR ADDITIONAL REQUIREMENTS.
3. FACE OF NEW WALLS TO ALIGN WITH FACE OF EXISTING ADJACENT WALL, UNLESS NOTED OTHERWISE.
4. WALL INFILL AT EXISTING WALLS SHALL BE SIZED TO MATCH EXISTING WALLS FACE OF NEW FINISH TO BE FLUSH WITH EXISTING FINISHED FACE ON EACH SIDE OF WALL.
5. SEE EXTERIOR AND INTERIOR ELEVATIONS FOR FURTHER CLARIFICATION OF MATERIALS / LOCATIONS / FINISHES.

GENERAL FLOOR PLAN NOTES:

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4. CAULK & SEAL ALL CONTROL-EXPANSION, SAWCUT JOINTS AT ALL INTERIOR & EXTERIOR MASONRY & CONCRETE. PROVIDE CONSTRUCTION AND CONTROL JOINTS IN CONCRETE SLABS ON GRADE AS SHOWN OR DETAILED ON STRUCTURAL DRAWINGS, IF NOT SHOWN, PROVIDE JOINTING PLAN
5. REGLUE EXISTING WALL VINYL IN ALL EXISTING MULTISTALL RESTROOMS.

WALL LEGEND:

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- NEW WALL CONSTRUCTION
- DEMO WALL
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- EXISTING WALLS UNDER ALT. 2 TO RECEIVE BALLISTICS RESISTANT PANEL

KEYNOTES

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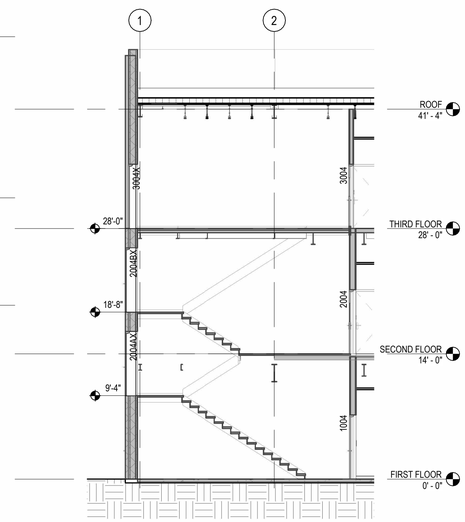
TRUE NORTH / PLAN NORTH

1 2ND FLOOR PLAN
1/8" = 1'-0"

FEET: 0 1 2 4 8 16 24
1/8"=1'-0"



2 PARKING RAMP STAIR SECTION
1/8" = 1'-0"
FOR REFERENCE ONLY

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SHEET SET: BID DOCUMENTS
SHEET NAME: SECOND FLOOR PLAN
SHEET: A1.12

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GENERAL EXISTING FLOOR PLAN NOTES:

1. SHADED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. ALL WALLS WITH SOUND BATT ATTENUATION BLANKETS ARE TO HAVE ACOUSTICAL SEALANT AT TOP AND BOTTOM. SEE WALL TYPES FOR ADDITIONAL REQUIREMENTS.
3. FACE OF NEW WALLS TO ALIGN WITH FACE OF EXISTING ADJACENT WALL, UNLESS NOTED OTHERWISE.
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GENERAL FLOOR PLAN NOTES:

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WALL LEGEND:

- EXISTING WALL
- NEW WALL CONSTRUCTION
- DEMO WALL
- ALT. 2 WALLS TO RECEIVE BALLISTICS RESISTANT PANEL
- EXISTING WALLS UNDER ALT. 2 TO RECEIVE BALLISTICS RESISTANT PANEL

1 3RD FLOOR PLAN
1/8" = 1'-0"

TRUE NORTH / PLAN NORTH

FEET: 0 1 2 4 8 16 24
1/8"=1'-0"

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PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: THIRD FLOOR PLAN

SHEET: A1.13

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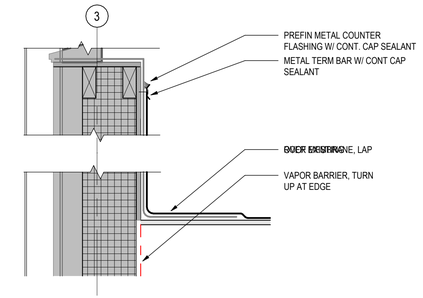
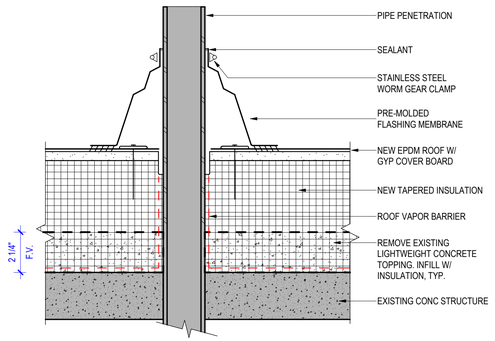
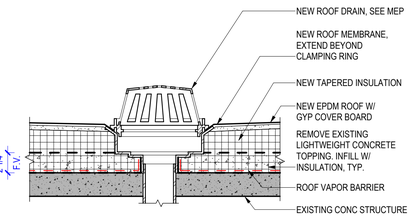


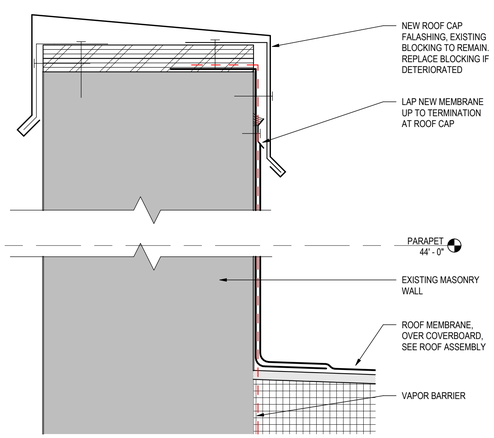
5 SECTION DETAIL - MEMBRANE TERMINATION AT SKYLIGHT
1 1/2" = 1'-0"



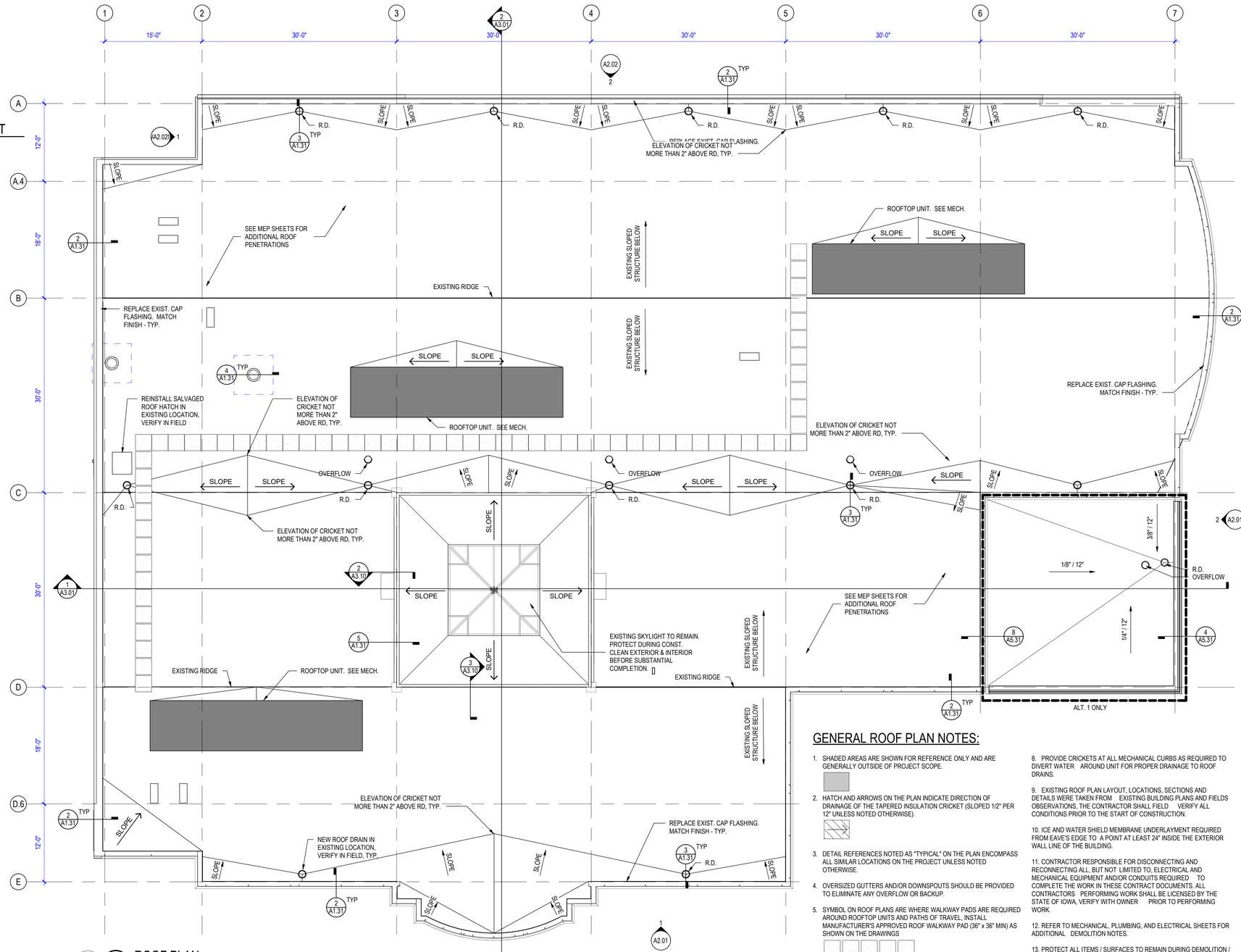
4 SECTION DETAIL - ROOF VENT - EXISTING ROOF TYP.
3" = 1'-0"



3 SECTION DETAIL - ROOF DRAIN - EXISTING ROOF TYP.
1 1/2" = 1'-0"



2 SECTION DETAIL - NEW PARAPET CAP TYP
3" = 1'-0"



NORTH

1 ROOF PLAN
1/8" = 1'-0"

GENERAL ROOF PLAN NOTES:

1. SHADED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. HATCH AND ARROWS ON THE PLAN INDICATE DIRECTION OF DRAINAGE OF THE TAPERED INSULATION CRICKET (SLOPED 1/2" PER 12" UNLESS NOTED OTHERWISE).
3. DETAIL REFERENCES NOTED AS "TYPICAL" ON THE PLAN ENCOMPASS ALL SIMILAR LOCATIONS ON THE PROJECT UNLESS NOTED OTHERWISE.
4. OVERSIZED GUTTERS AND/OR DOWNSPOUTS SHOULD BE PROVIDED TO ELIMINATE ANY OVERFLOW OR BACKUP.
5. SYMBOL ON ROOF PLANS ARE WHERE WALKWAY PADS ARE REQUIRED AROUND ROOFTOP UNITS AND PATHS OF TRAVEL, INSTALL MANUFACTURER'S APPROVED ROOF WALKWAY PAD (36" x 36" MIN) AS SHOWN ON THE DRAWINGS
6. REFER TO AND SUBMIT ALL APPLICABLE STANDARD DETAILS FROM AWARDED ROOFING MANUFACTURER FOR APPROVAL FOR BUT NOT LIMITED TO, PIPE PENETRATIONS, CURB FLASHING, INSIDE AND OUTSIDE CORNER APPLICATIONS, ETC.
7. CONTRACTOR TO INSTALL ROOF TO MEET ROOFING MANUFACTURERS REQUIREMENTS TO OBTAIN THE ROOF WARRANTY SPECIFIED. ALERT ARCHITECT PRIOR TO INSTALLATION IF DISCREPANCIES IN THE EXISTING AND/OR POTENTIAL NEW ROOF CONDITIONS WILL NOT MEET THE MANUFACTURER WARRANTY REQUIREMENTS.
8. PROVIDE CRICKETS AT ALL MECHANICAL CURBS AS REQUIRED TO DIVERT WATER AROUND UNIT FOR PROPER DRAINAGE TO ROOF DRAINS.
9. EXISTING ROOF PLAN LAYOUT, LOCATIONS, SECTIONS AND DETAILS WERE TAKEN FROM EXISTING BUILDING PLANS AND FIELDS OBSERVATIONS, THE CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS PRIOR TO THE START OF CONSTRUCTION.
10. ICE AND WATER SHIELD MEMBRANE UNDERLAYMENT REQUIRED FROM EAVE'S EDGE TO A POINT AT LEAST 24" INSIDE THE EXTERIOR WALL LINE OF THE BUILDING.
11. CONTRACTOR RESPONSIBLE FOR DISCONNECTING AND RECONNECTING ALL, BUT NOT LIMITED TO, ELECTRICAL AND MECHANICAL EQUIPMENT AND/OR CONDUITS REQUIRED TO COMPLETE THE WORK IN THESE CONTRACT DOCUMENTS. ALL CONTRACTORS PERFORMING WORK SHALL BE LICENSED BY THE STATE OF IOWA, VERIFY WITH OWNER PRIOR TO PERFORMING WORK.
12. REFER TO MECHANICAL, PLUMBING, AND ELECTRICAL SHEETS FOR ADDITIONAL DEMOLITION NOTES.
13. PROTECT ALL ITEMS / SURFACES TO REMAIN DURING DEMOLITION / CONSTRUCTION. REPAIR / REPLACE ALL ITEMS / SURFACES DAMAGED DURING DEMOLITION / CONSTRUCTION TO MATCH EXISTING CONDITIONS.
14. CUTTING TORCHES ARE NOT ALLOWED FOR WORK ON ROOF.
15. ROOF TRUSSES DESIGN BUILD BY TRUSS MANUFACTURER.

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Description	Date	No.

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DATE	NAME

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NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: ROOF PLAN

SHEET: A1.31

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GENERAL INTERIOR ELEVATION NOTES:

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2. ALL PLUMBING FIXTURES SHOWN ON THIS SHEET ARE PROVIDED FOR COORDINATION PURPOSES ONLY. REFER TO PLUMBING DOCUMENTS FOR SPECIFIC DESIGN INFO.
3. ALL REST ROOMS, FIXTURES & ACCESSORIES SHALL BE COMMERCIAL GRADE AND SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
4. PROVIDE ADEQUATE BLOCKING FOR ALL REST ROOM FIXTURES, EQUIPMENT AND WALL MOUNTED ITEMS.
5. ELECTRICAL OUTLETS AND COMMUNICATION RECEPTACLES SHOWN ON ARCHITECTURAL DRAWINGS DO NOT INCLUDE THE ENTIRE SCOPE OF WORK AND ARE SHOWN WHERE THERE MAY BE COORDINATION ISSUES WITH OTHER WORK. FOR FURTHER CLARIFICATION, CONSULT ELECTRICAL DRAWINGS.

GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • W • L
24 • 24 • 34.5

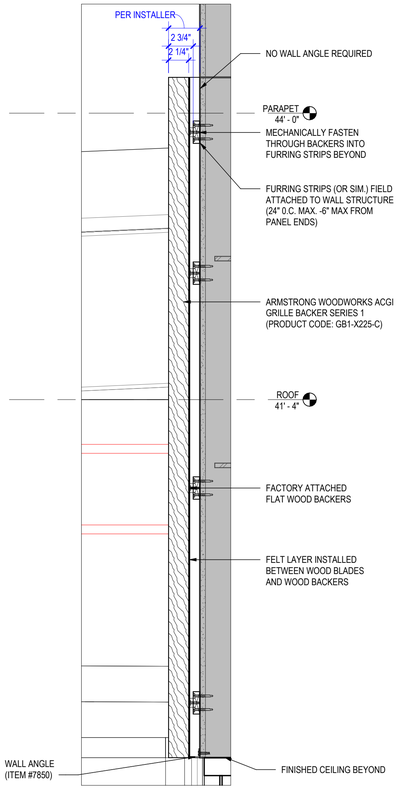
- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

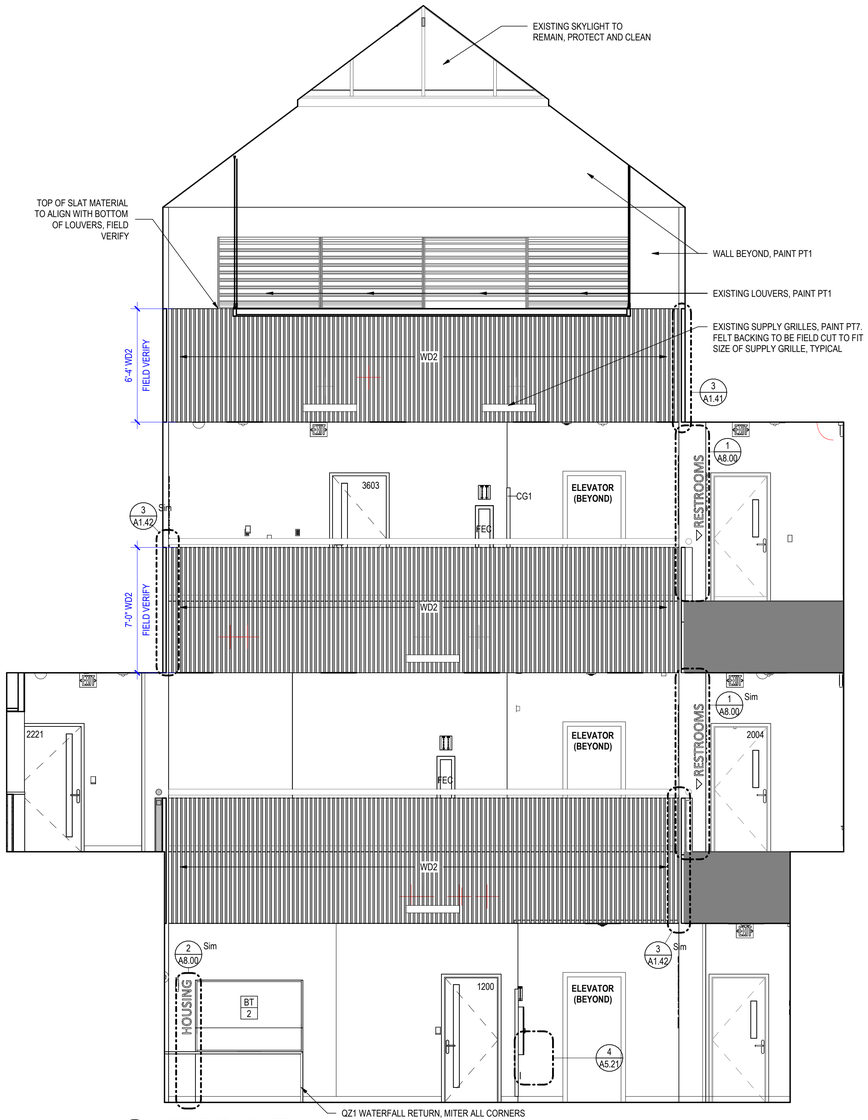
PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

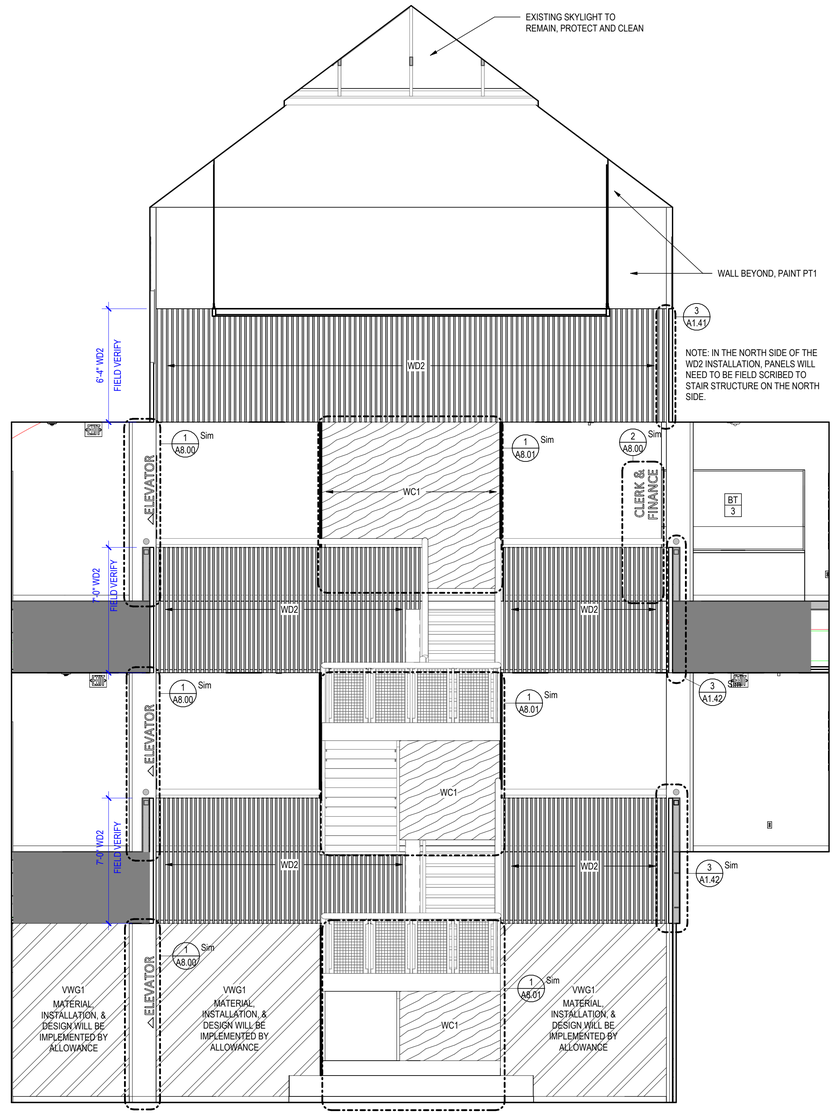
1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, SPECIFICATION, AND EXISTING FIELD CONDITIONS.
4. PROVIDE ADEQUATE BLOCKING FOR ALL CABINETS, FIXTURES, AND EQUIPMENT.
5. ALL EXPOSED AND SEMI-EXPOSED SURFACES TO RECEIVE FINISHED EDGES/PANELS TO MATCH ADJACENT SURFACES.
6. ALL EXPOSED WOOD TO BE SEALED PER FINISH SCHEDULE AND SPECIFICATION.
7. ALL EXPOSED STEEL TO BE PAINTED PER FINISH SCHEDULE AND SPECIFICATION.
8. SEE FINISH SCHEDULE FOR ALL PLAM SELECTIONS.
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.



3 ATRIUM UPPER DECK SECTION DTL TYP.
1 1/2" = 1'-0"



2 1002 PUBLIC ATRIUM - WEST
1/4" = 1'-0"



1 1002 PUBLIC ATRIUM - NORTH
1/4" = 1'-0"

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
INTERIOR ELEVATIONS - PUBLIC ATRIUM

SHEET:
A1.41

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GENERAL INTERIOR ELEVATION NOTES:

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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM — CUSTOM SIZE
CUSTOM — MATERIAL
PLAM1 • V • 1 — LOCK INDICATOR
24 • 24 • 34.5 — LIGHT VALANCE
SIZE: W•D•H

COUNTERTOP TAG

PLAM1 — MATERIAL
4 • 25 • 1.50 — COUNTERTOP THICKNESS
COUNTERTOP SIZE: D
BACKSPLASH SIZE: H

1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, SPECIFICATION, AND EXISTING FIELD CONDITIONS.
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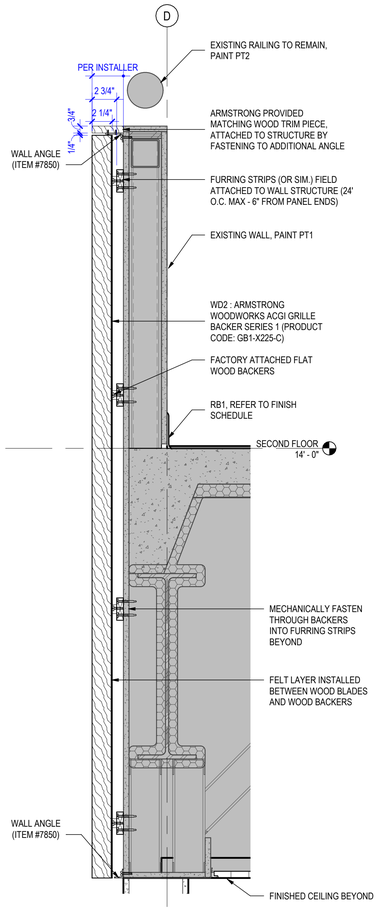
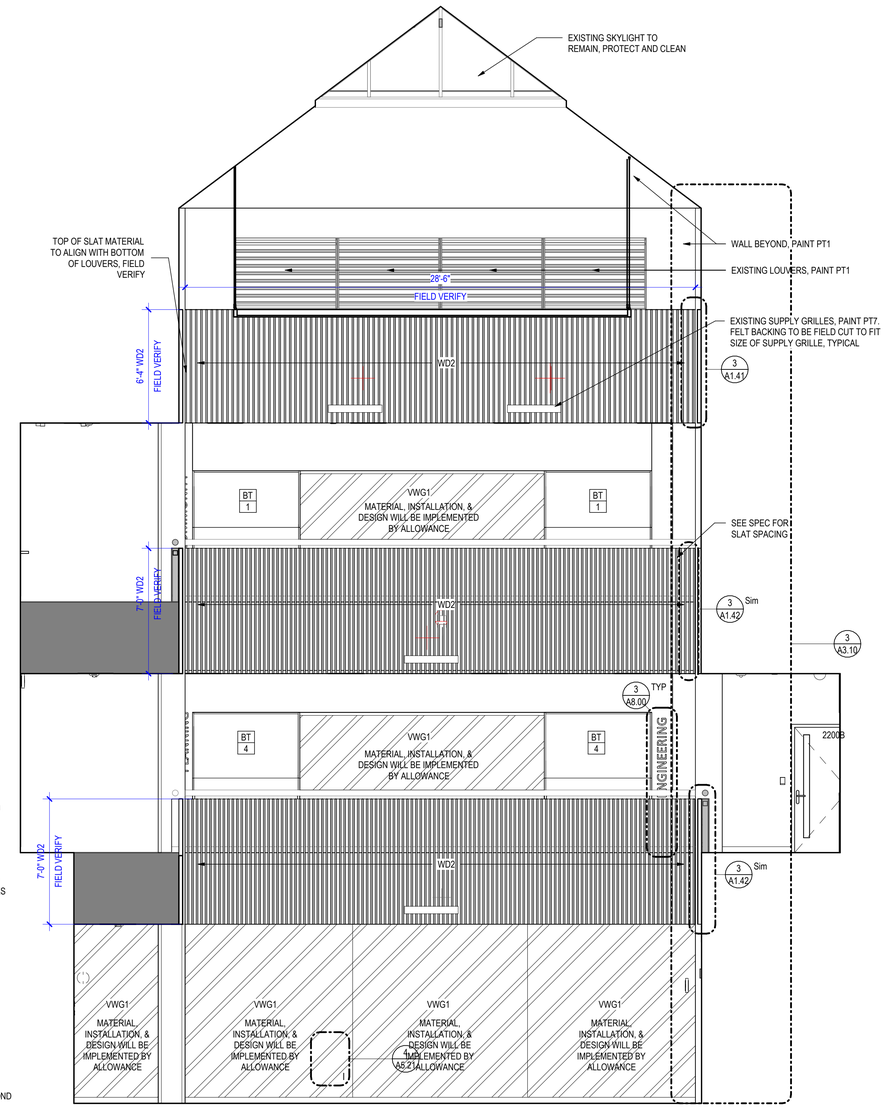
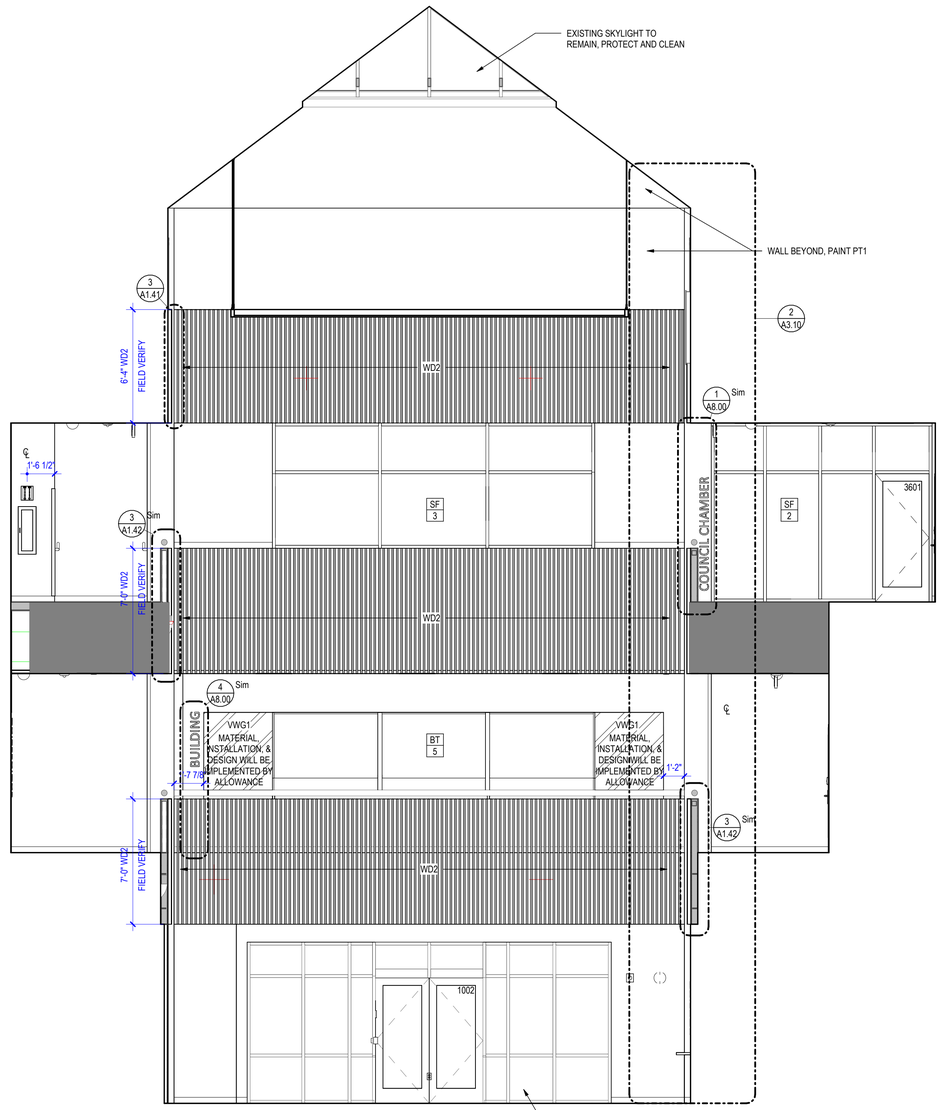
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.



3 ATRIUM RAILING SECTION DTL TYP.
1 1/2" = 1'-0"



2 1002 PUBLIC ATRIUM - EAST
1/4" = 1'-0"



1 1002 PUBLIC ATRIUM - SOUTH
1/4" = 1'-0"

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DATE	NAME

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WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: INTERIOR ELEVATIONS - PUBLIC ATRIUM

SHEET: A1.42

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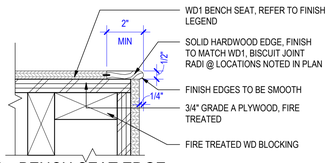
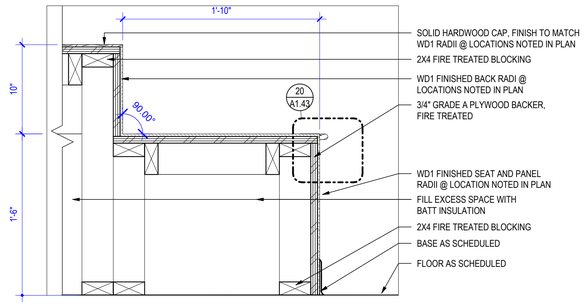
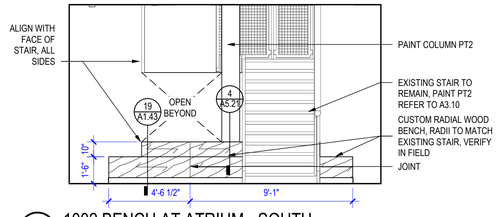


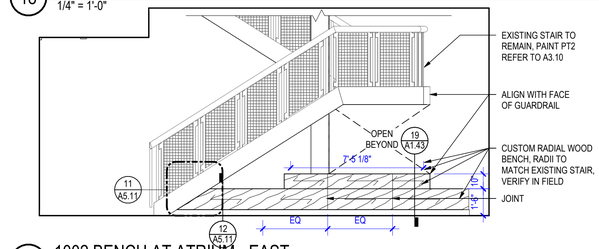
20 BENCH SEAT EDGE
3" = 1'-0"



19 PREFUNCTION BENCH DETAIL
1 1/2" = 1'-0"



17 1002 BENCH AT ATRIUM - SOUTH
1/4" = 1'-0"



16 1002 BENCH AT ATRIUM - EAST
1/4" = 1'-0"

15 1002 BENCH AT ATRIUM - NORTH
1/4" = 1'-0"

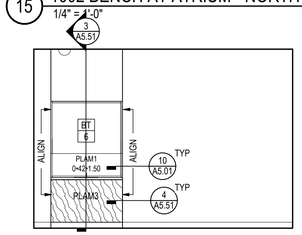
18 1002 BENCH AT ATRIUM - WEST
1/4" = 1'-0"

16 1002 BENCH AT ATRIUM - EAST
1/4" = 1'-0"

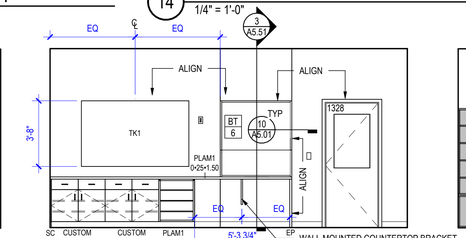
15 1002 BENCH AT ATRIUM - NORTH
1/4" = 1'-0"

14 1002 HOUSING TRANSACTION COUNTER - WEST
1/4" = 1'-0"

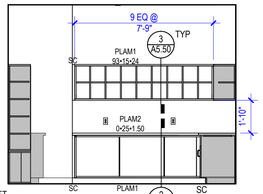
13 1100 HOUSING DEPT. OPEN OFFICE - EAST
1/4" = 1'-0"



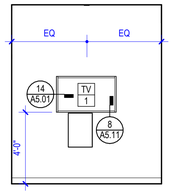
12 1328 POLICE WAITING - SOUTH
1/4" = 1'-0"



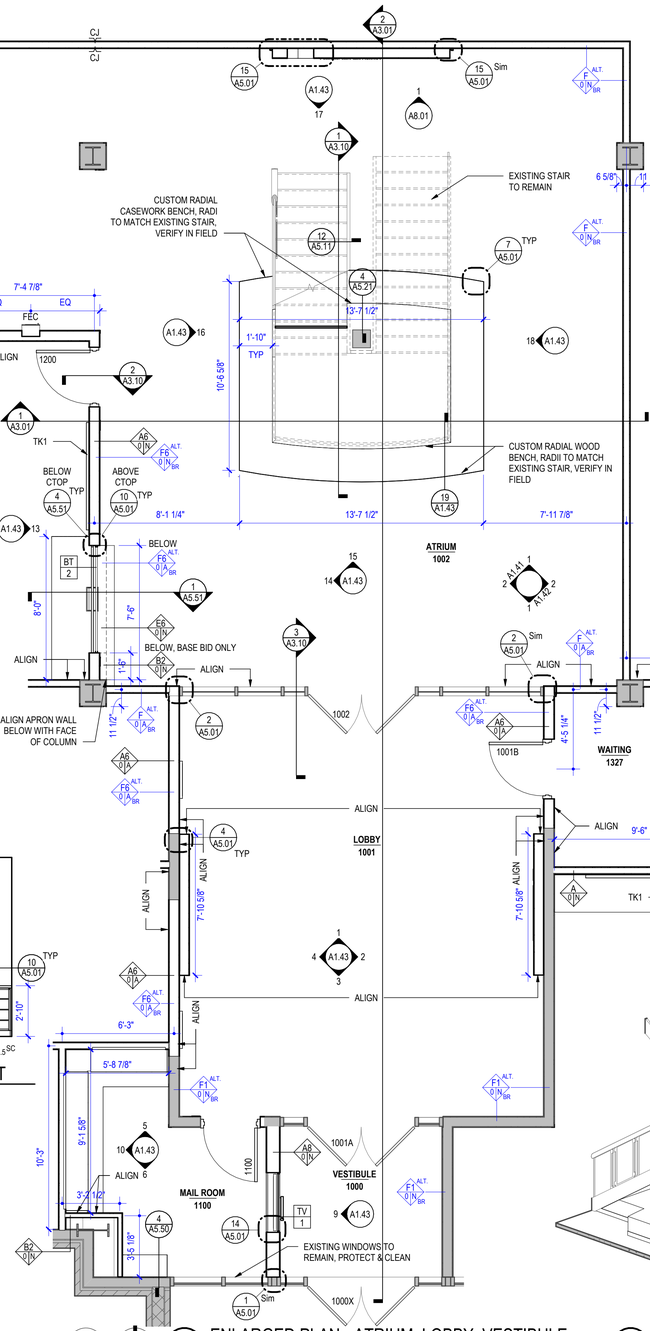
11 1328 POLICE RECORDS - NORTH
1/4" = 1'-0"



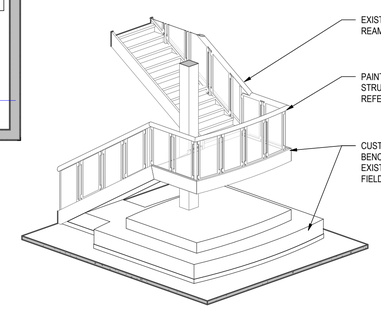
10 1100 MAIL ROOM - WEST
1/4" = 1'-0"



9 1000 DISPLAY AT VEST. - WEST
1/4" = 1'-0"

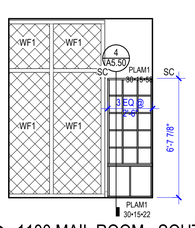


8 ENLARGED PLAN - ATRIUM, LOBBY, VESTIBULE
1/4" = 1'-0"

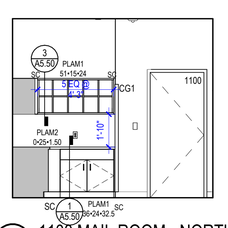


7 3D VIEW - PREFUNCTION BUILT-IN BENCH

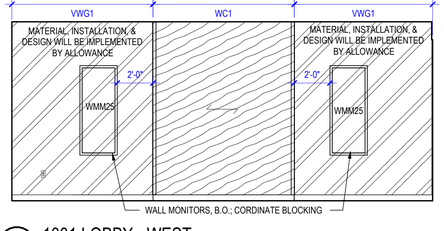
TRUE NORTH
PLAN NORTH



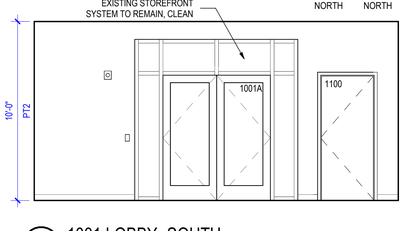
6 1100 MAIL ROOM - SOUTH
1/4" = 1'-0"



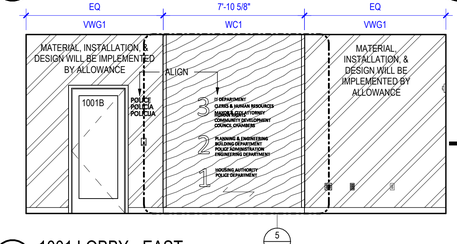
5 1100 MAIL ROOM - NORTH
1/4" = 1'-0"



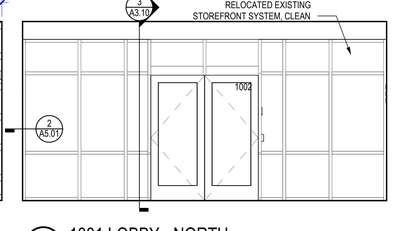
4 1001 LOBBY - WEST
1/4" = 1'-0"



3 1001 LOBBY -SOUTH
1/4" = 1'-0"



2 1001 LOBBY - EAST
1/4" = 1'-0"



1 1001 LOBBY - NORTH
1/4" = 1'-0"

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2. ALL PLUMBING FIXTURES SHOWN ON THIS SHEET ARE PROVIDED FOR COORDINATION PURPOSES ONLY. REFER TO PLUMBING DOCUMENTS FOR SPECIFIC DESIGN INFO.
3. ALL REST ROOMS, FIXTURES & ACCESSORIES SHALL BE COMMERCIAL GRADE AND SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
4. PROVIDE ADEQUATE BLOCKING FOR ALL REST ROOM FIXTURES, EQUIPMENT AND WALL MOUNTED ITEMS.
5. ELECTRICAL OUTLETS AND COMMUNICATION RECEPTACLES SHOWN ON ARCHITECTURAL DRAWINGS DO NOT INCLUDE THE ENTIRE SCOPE OF WORK AND ARE SHOWN WHERE THERE MAY BE COORDINATION ISSUES WITH OTHER WORK. FOR FURTHER CLARIFICATION, CONSULT ELECTRICAL DRAWINGS.

GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM PLAM1 V-L 24 • 24 • 34.5
- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

PLAM1 4 • 25 • 1.50
- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, SPECIFICATION, AND EXISTING FIELD CONDITIONS.
4. PROVIDE ADEQUATE BLOCKING FOR ALL CABINETS, FIXTURES, AND EQUIPMENT.
5. ALL EXPOSED AND SEMI-EXPOSED SURFACES TO RECEIVE FINISHED EDGES/PANELS TO MATCH ADJACENT SURFACES.
6. ALL EXPOSED WOOD TO BE SEALED PER FINISH SCHEDULE AND SPECIFICATION.
7. ALL EXPOSED STEEL TO BE PAINTED PER FINISH SCHEDULE AND SPECIFICATION.
8. SEE FINISH SCHEDULE FOR ALL PLAM SELECTIONS.
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.

INVISION
PLANNING | ARCHITECTURE | INTERIORS

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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: FIRST FLOOR ENLARGED PLANS & INTERIOR ELEVATIONS - LOBBY & ATRIUM

SHEET: A1.43

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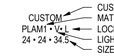
GENERAL MILLWORK NOTES:

CASEWORK TAG



COUNTERTOP TAG



1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
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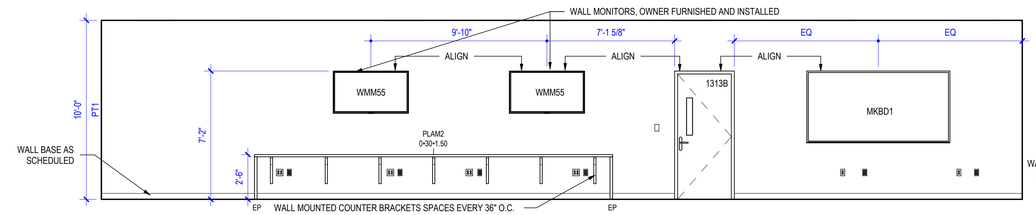
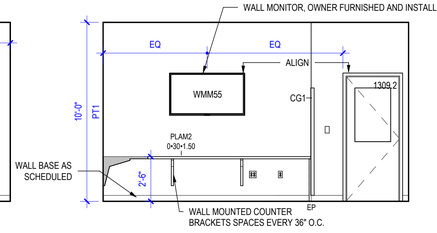
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.



6 1309 PATROL BAY - SOUTH
1/4" = 1'-0"



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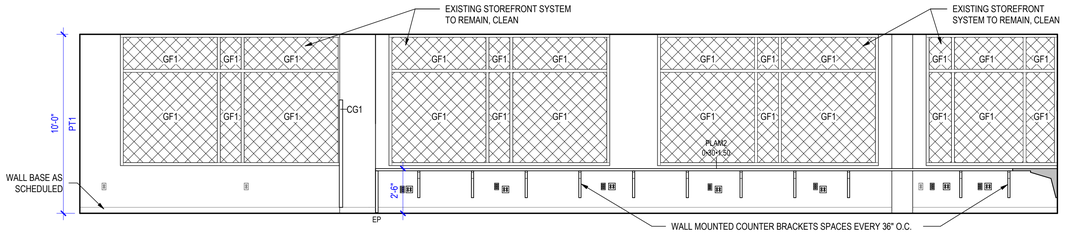
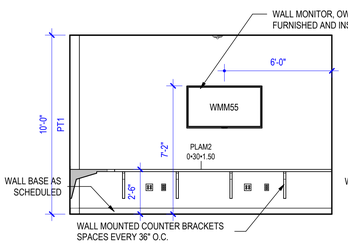
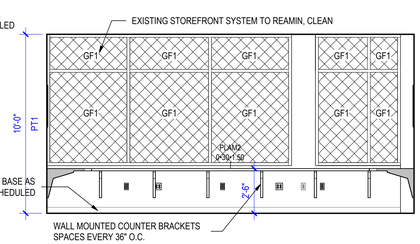
1/4" = 1'-0"



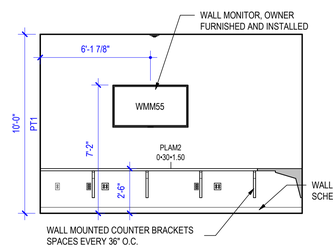
4 1309 PATROL BAY - NORTH
1/4" = 1'-0"



3 1315 PATROL SGT. ROOM - SOUTH
1/4" = 1'-0"



2 1315 PATROL SGT. ROOM - EAST
1/4" = 1'-0"



1 1315 PATROL SGT. ROOM - NORTH
1/4" = 1'-0"

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INVISION
PLANNING | ARCHITECTURE | INTERIORS

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319.233.8419
www.invisionarch.com

CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR ENLARGED PLANS & INTERIOR ELEVATIONS - POLICE DEPT.

SHEET:
A1.44

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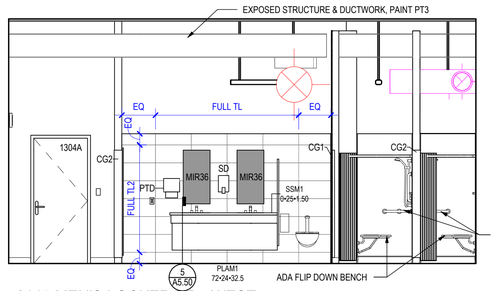
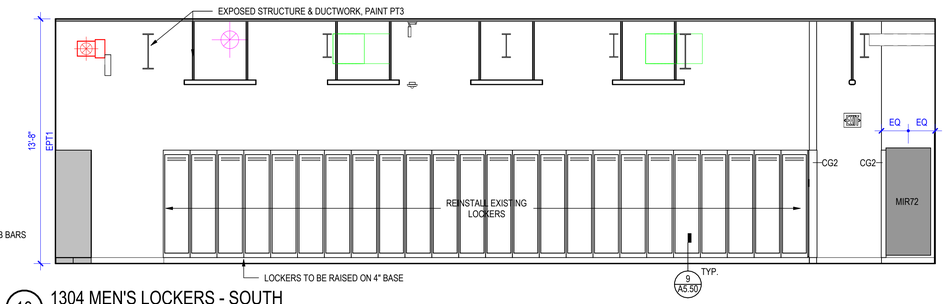
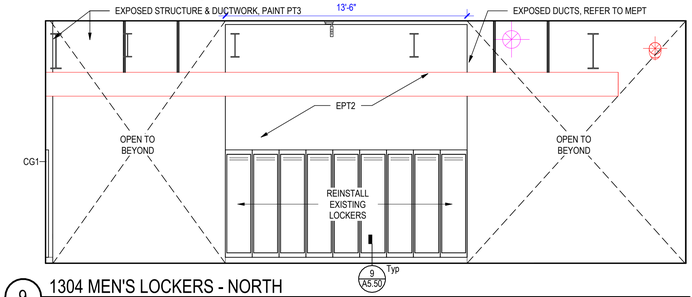


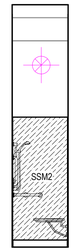
11 2145 MEN'S LOCKER RR - WEST
1/4" = 1'-0"



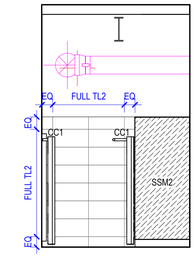
10 1304 MEN'S LOCKERS - SOUTH
1/4" = 1'-0"



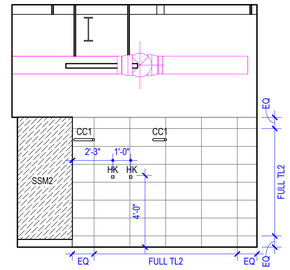
9 1304 MEN'S LOCKERS - NORTH
1/4" = 1'-0"



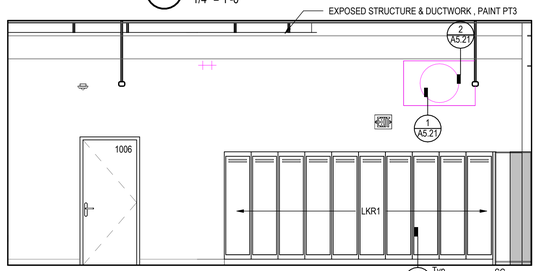
8 SSM SHOWER - WEST
1/4" = 1'-0"



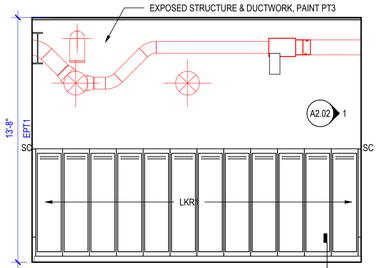
7 SSM SHOWER - SOUTH
1/4" = 1'-0"



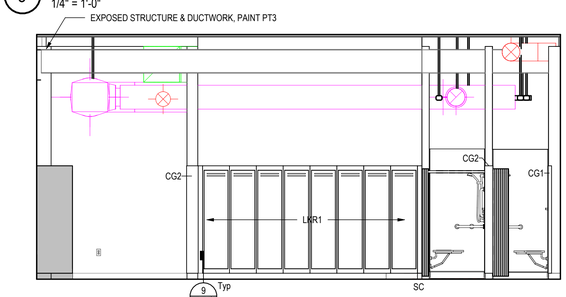
6 SSM SHOWER - NORTH
1/4" = 1'-0"



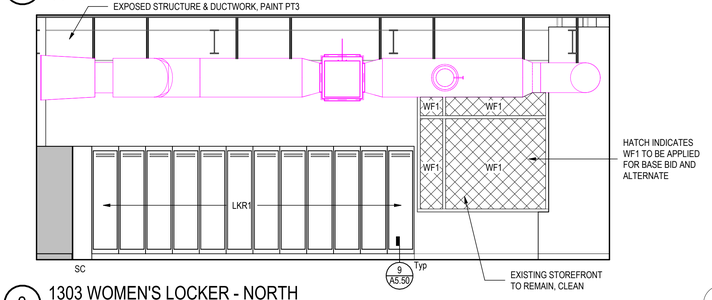
5 1303 WOMEN'S LOCKERS - WEST
1/4" = 1'-0"



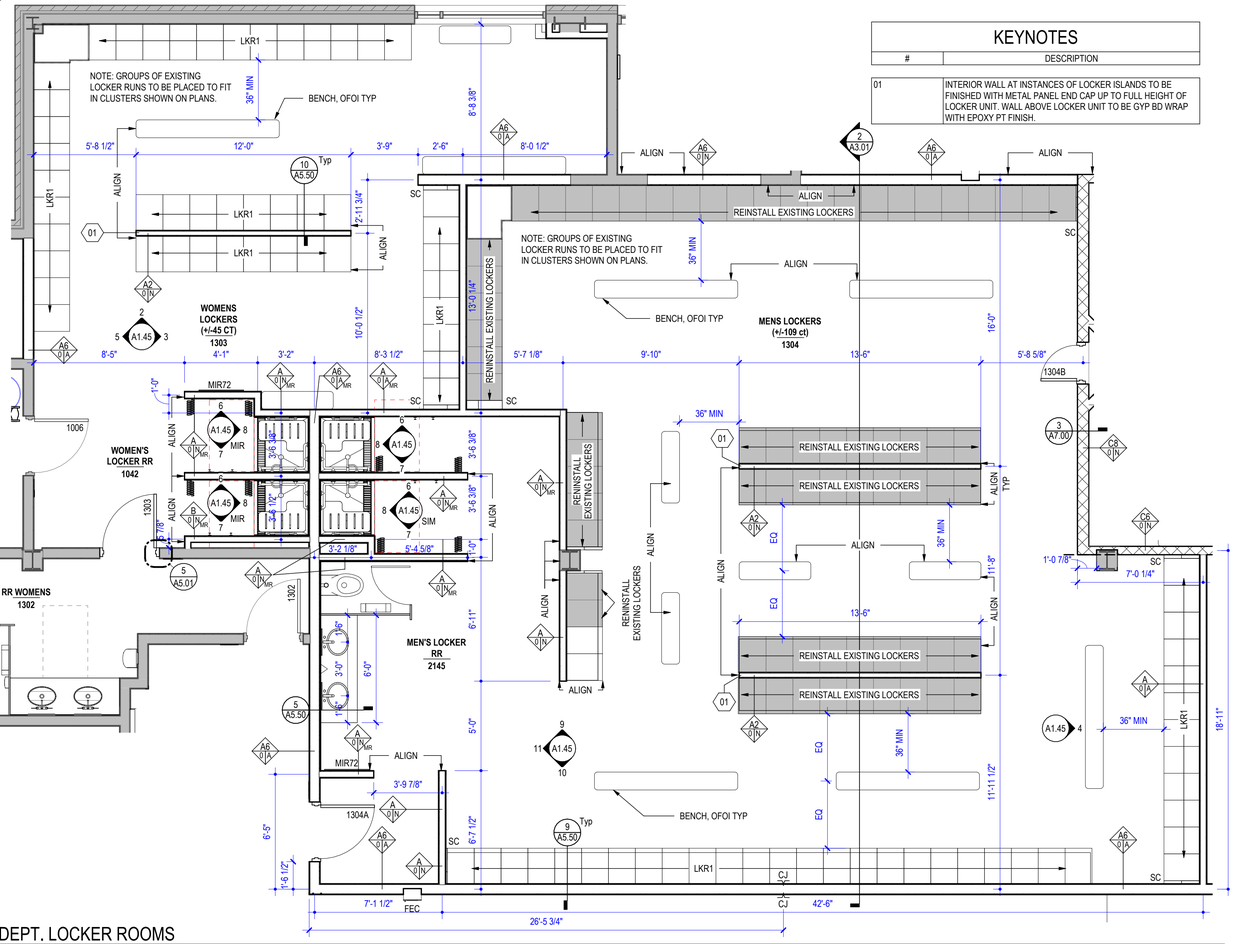
4 1304 MEN'S LOCKERS - EAST
1/4" = 1'-0"



3 1303 WOMEN'S LOCKERS - EAST
1/4" = 1'-0"



2 1303 WOMEN'S LOCKER - NORTH
1/4" = 1'-0"



1 ENLARGED PLAN - POLICE DEPT. LOCKER ROOMS
1/4" = 1'-0"

NORTH

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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • V • L
24 • 24 • 34.5

- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, SPECIFICATION, AND EXISTING FIELD CONDITIONS.
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7. ALL EXPOSED STEEL TO BE PAINTED PER FINISH SCHEDULE AND SPECIFICATION.
8. SEE FINISH SCHEDULE FOR ALL PLAM SELECTIONS.
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.

KEYNOTES

#	DESCRIPTION
01	INTERIOR WALL AT INSTANCES OF LOCKER ISLANDS TO BE FINISHED WITH METAL PANEL END CAP UP TO FULL HEIGHT OF LOCKER UNIT. WALL ABOVE LOCKER UNIT TO BE GYP BD WRAP WITH EPOXY PT FINISH.

INVISION
PLANNING | ARCHITECTURE | INTERIORS

360 Westfield Avenue
Suite 401
Waterloo, IA 50701
319.233.8419
www.invisionarch.com

CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR ENLARGED PLAN & INTERIOR ELEVATIONS - POLICE DEPT. LOCKER ROOMS

SHEET:
A1.45

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SHEET RESPONSIBILITY:INITIALS
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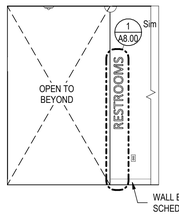
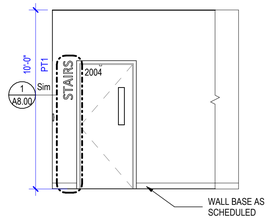
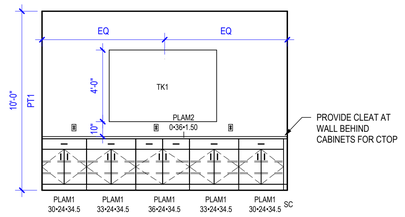


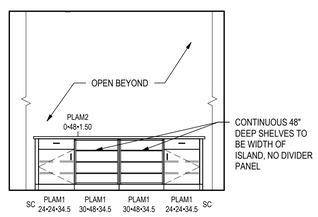
16 TYPICAL RR WALL SIGNAGE
1/4" = 1'-0"



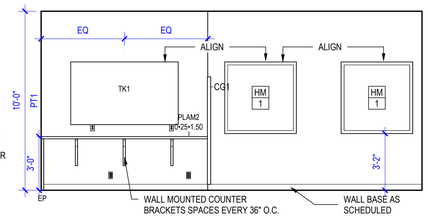
15 TYPICAL STAIR SIGNAGE
1/4" = 1'-0"



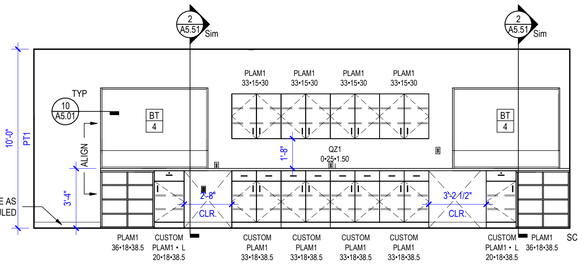
14 2208 PRINT ROOM - SOUTH
1/4" = 1'-0"



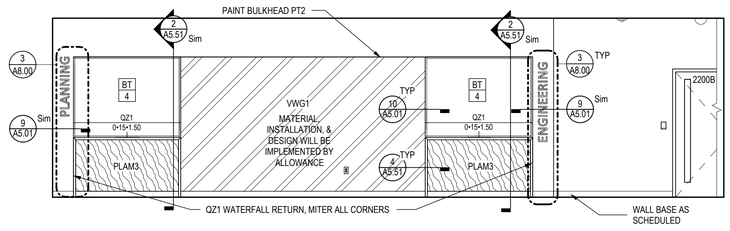
13 2200 CITY DEPT. STORAGE ISLAND - EAST
1/4" = 1'-0"



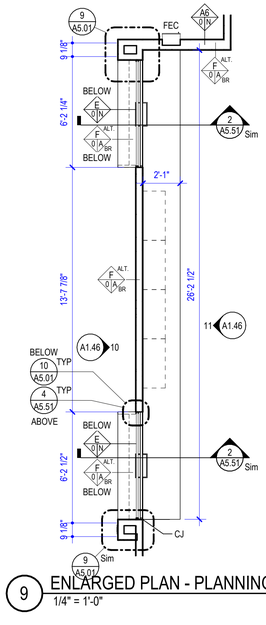
12 2200 CITY DEPT. - WEST
1/4" = 1'-0"



11 2200 CITY DEPT. PLANNING & ENGINEERING - WEST
1/4" = 1'-0"

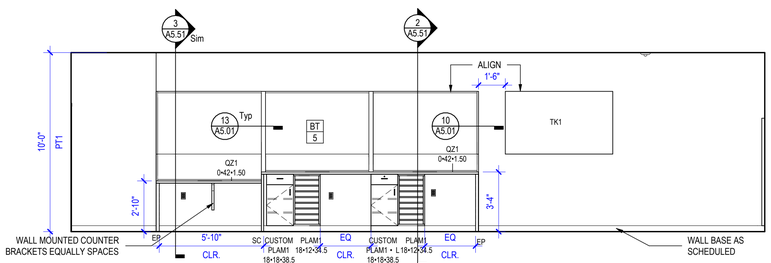


10 2020 CITY DEPT. TRANSACTION WINDOW - EAST
1/4" = 1'-0"

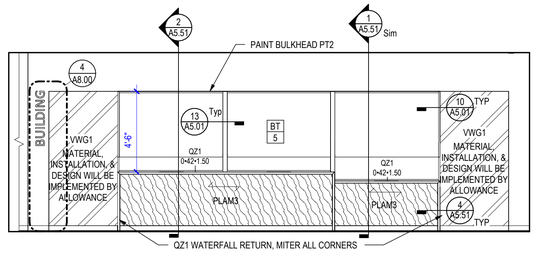


NORTH

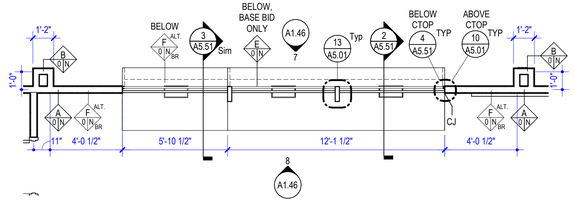
9 ENLARGED PLAN - PLANNING & ENGINEERING
1/4" = 1'-0"



8 2200 BUILDING DEPARTMENT - NORTH
1/4" = 1'-0"

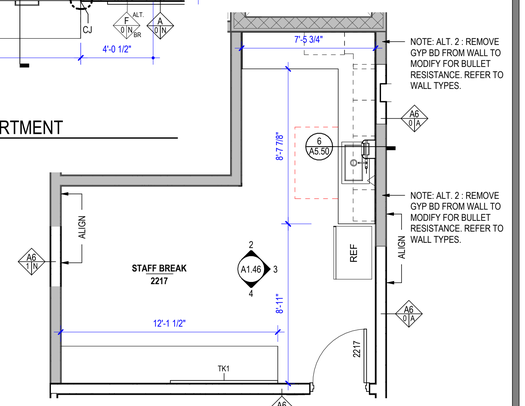


7 2021 BUILDING DEPARTMENT - SOUTH
1/4" = 1'-0"

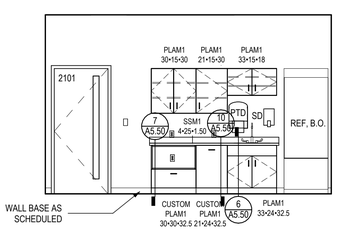


NORTH

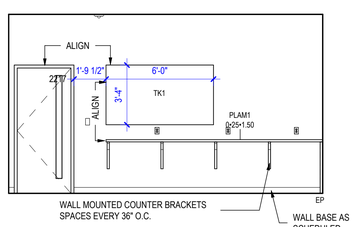
6 ENLARGED PLAN - BUILDING DEPARTMENT
1/4" = 1'-0"



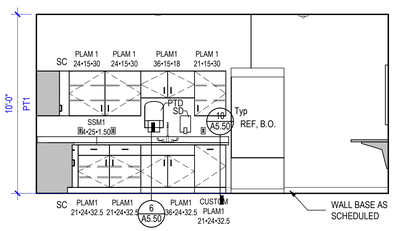
1 ENLARGED PLAN - STAFF BREAK
1/4" = 1'-0"



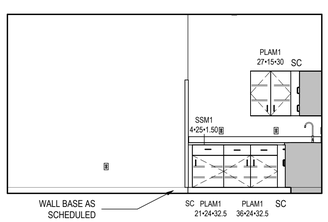
5 2101 POLICE BREAK - SOUTH
1/4" = 1'-0"



4 2217 STAFF BREAK - SOUTH
1/4" = 1'-0"



3 2217 STAFF BREAK - EAST
1/4" = 1'-0"



2 2217 STAFF BREAK - NORTH
1/4" = 1'-0"

NORTH

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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • L
24 • 24 • 34.5

- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

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PLANNING | ARCHITECTURE | INTERIORS

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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: SECOND FLOOR ENLARGED PLANS & INTERIOR ELEVATIONS

SHEET: A1.46

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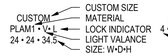
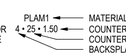
CASEWORK TAG



COUNTERTOP TAG



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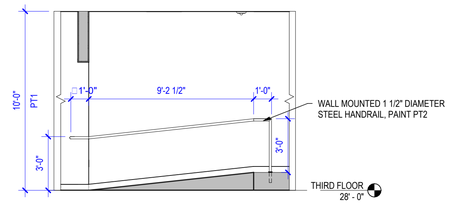
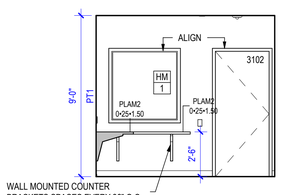
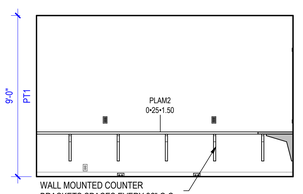


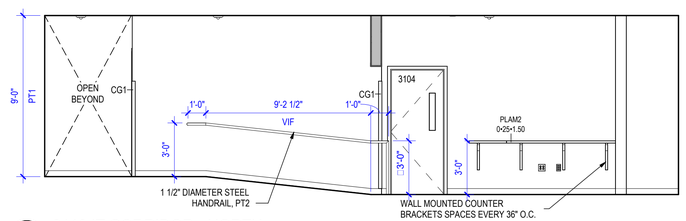
13 IT RAMP SECTION
1/4" = 1'-0"



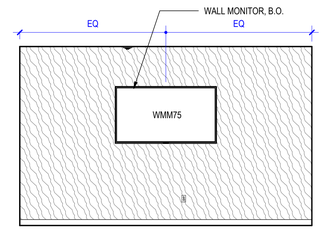
12 3102 CONTROL ROOM - EAST
1/4" = 1'-0"



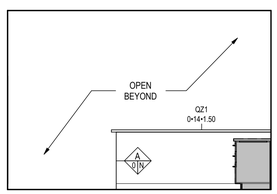
11 3102 CONTROL ROOM - NORTH
1/4" = 1'-0"



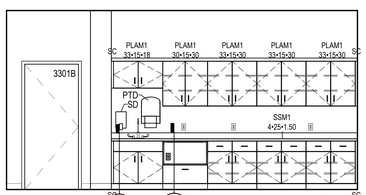
10 3110 IT CORRIDOR - NORTH
1/4" = 1'-0"



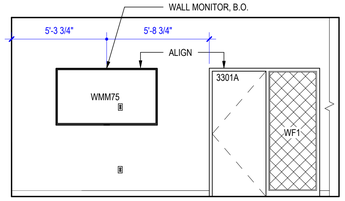
9 3307 MEETING ROOM - NORTH
1/4" = 1'-0"



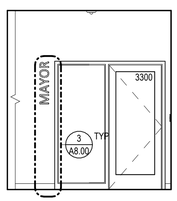
8 3306 MAYOR'S RECEPTION - EAST
1/4" = 1'-0"



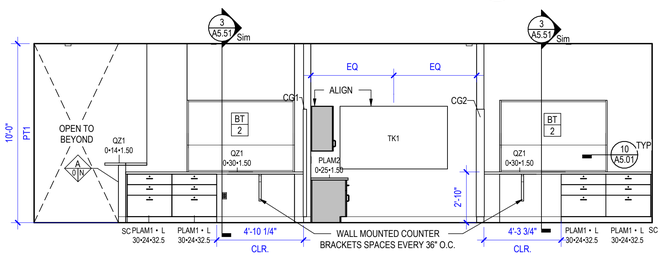
7 3307 MEETING ROOM KITCHENETTE - SOUTH
1/4" = 1'-0"



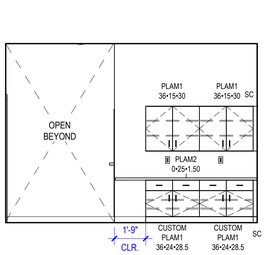
6 3300 MAYOR'S SUITE - WEST
1/4" = 1'-0"



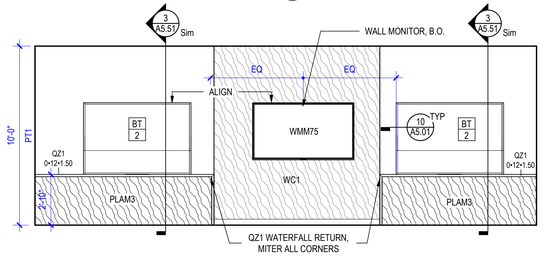
5 3000 MAYOR'S SUITE ENTRANCE - EAST
1/4" = 1'-0"



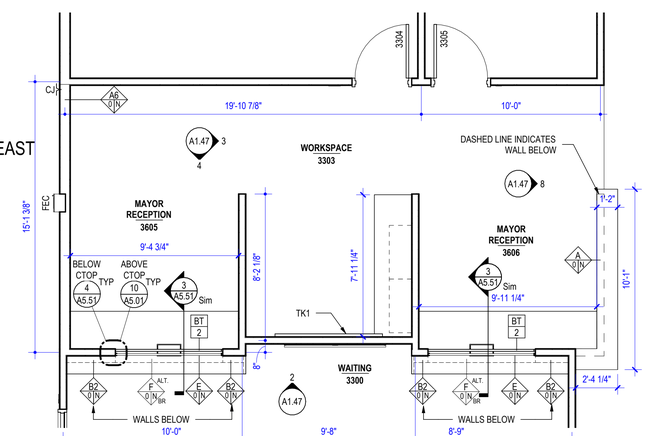
4 3605/3606 MAYOR RECEPTION - SOUTH
1/4" = 1'-0"



3 3303 WORKSPACE - EAST
1/4" = 1'-0"



2 3300 MAYOR WAITING - NORTH
1/4" = 1'-0"



1 ENLARGED PLAN - MAYOR'S SUITE
1/4" = 1'-0"

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STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR ENLARGED PLAN & INTERIOR ELEVATIONS - MAYOR'S SUITE & TECH SERVICES

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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • W•L
24 • 24 • 34.5

- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
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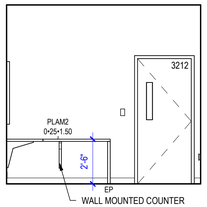
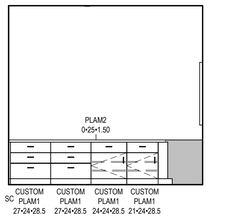
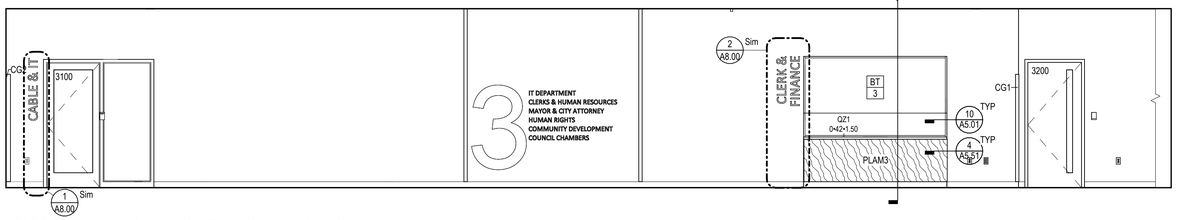
4. PROVIDE ADEQUATE BLOCKING FOR ALL CABINETS, FIXTURES, AND EQUIPMENT.
5. ALL EXPOSED AND SEMI-EXPOSED SURFACES TO RECEIVE FINISHED EDGES/PANELS TO MATCH ADJACENT SURFACES.
6. ALL EXPOSED WOOD TO BE SEALED PER FINISH SCHEDULE AND SPECIFICATION.
7. ALL EXPOSED STEEL TO BE PAINTED PER FINISH SCHEDULE AND SPECIFICATION.
8. SEE FINISH SCHEDULE FOR ALL PLAM SELECTIONS.
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.



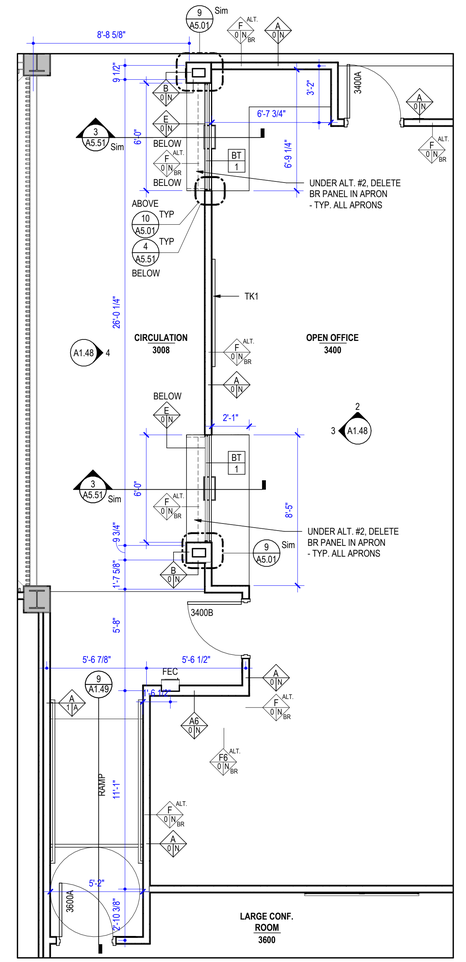
10 3212 CLERKS OFFICE - WEST
1/4" = 1'-0"



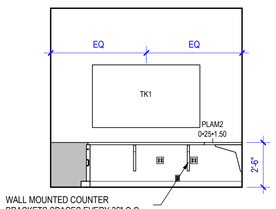
9 3212 CLERKS OFFICE - EAST
1/4" = 1'-0"



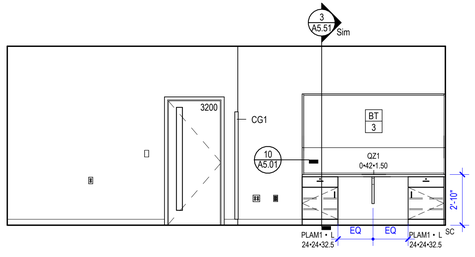
8 3000 CLERKS TRANSACTION COUNTER - NORTH
1/4" = 1'-0"



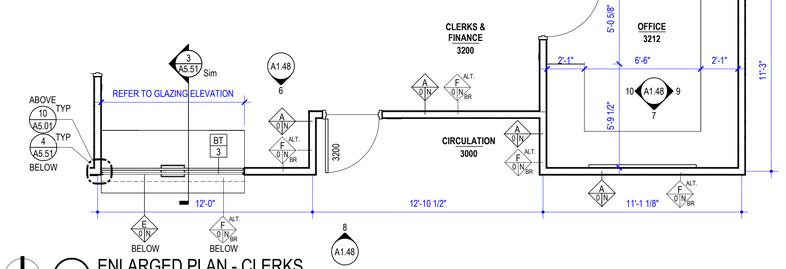
1 3RD FLOOR ENLARGED PLAN - COMM. DEV. & HUMAN RIGHTS
1/4" = 1'-0"



7 3212 OFFICE - SOUTH
1/4" = 1'-0"

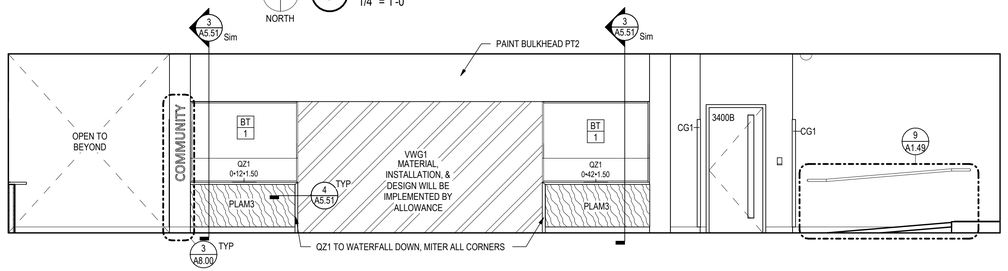


6 3200 CLERKS - SOUTH
1/4" = 1'-0"

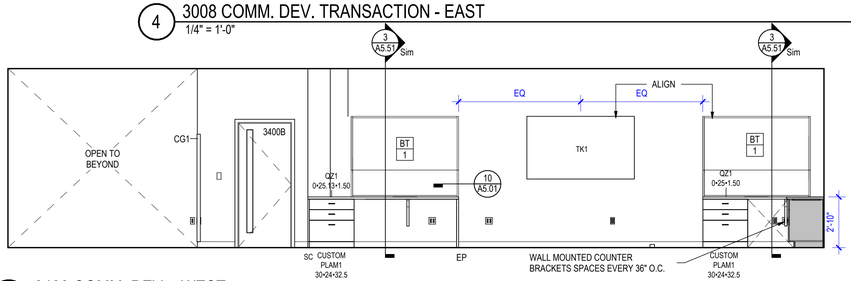


NORTH

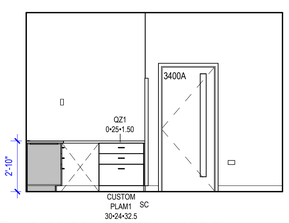
5 ENLARGED PLAN - CLERKS
1/4" = 1'-0"



4 3008 COMM. DEV. TRANSACTION - EAST
1/4" = 1'-0"



3 3400 COMM. DEV. - WEST
1/4" = 1'-0"



2 3400 COMM. DEV. - NORTH
1/4" = 1'-0"

NORTH

INVISION
PLANNING | ARCHITECTURE | INTERIORS

360 Westfield Avenue
Suite 401
Waterloo, IA 50701
319.233.8419
www.invisionarch.com

CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR ENLARGED PLAN & INTERIOR ELEVATIONS - COMM. DEV., HUMAN SERVICES, CLERKS

SHEET:
A1.48

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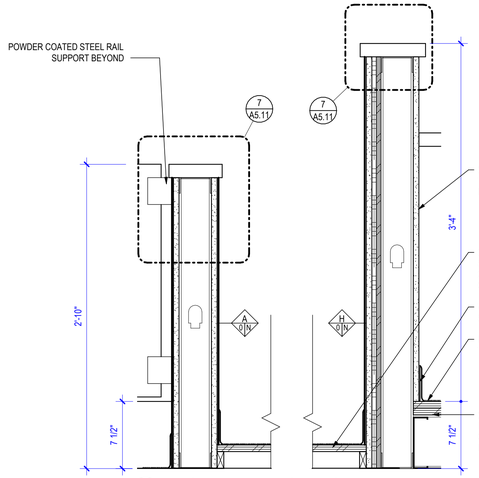
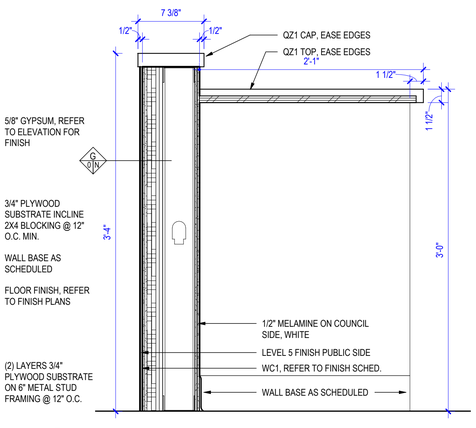
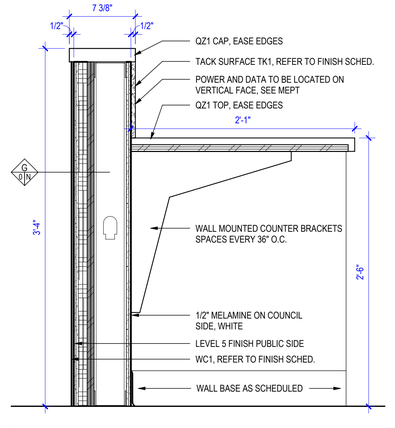


15 INCLINE AT DIAS - EAST
1 1/2" = 1'-0"



14 SECTION DETAIL - COUNCIL CHAMBER DIAS PODIUM
1 1/2" = 1'-0"



13 SECTION DETAIL - COUNCIL CHAMBERS DIAS DESK
1 1/2" = 1'-0"

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1. REFER TO ADDITIONAL NOTES AND REQUIREMENTS ON ALL OTHER DOCUMENTS, OTHER DISCIPLINES AND SPECIFICATIONS.
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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • W-L
24 • 24 • 34.5

- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W-D-H

COUNTERTOP TAG

PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

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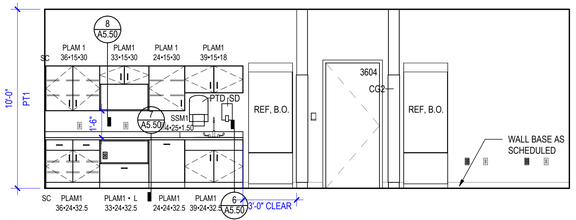
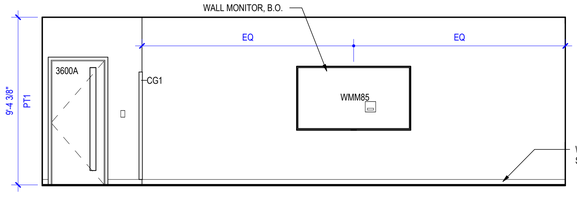
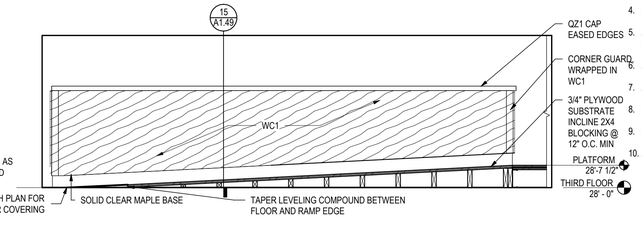
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.



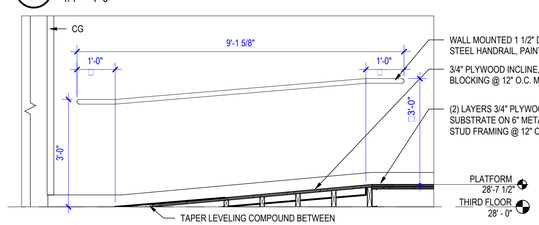
12 3603 BREAK ROOM - NORTH
1/4" = 1'-0"



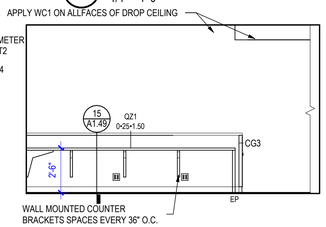
11 3600 LARGE CONF. ROOM - NORTH
1/4" = 1'-0"



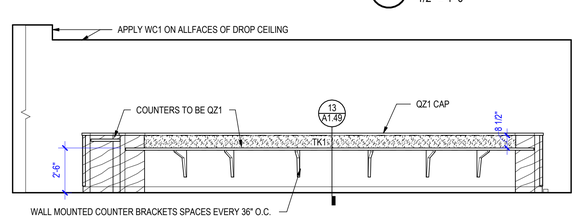
10 COUNCIL CHAMBERS INCLINE AT DIAS SECTION DTL - NORTH
1/2" = 1'-0"



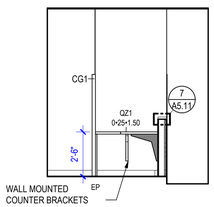
9 3600 LARGE CONF. ROOM - INCLINE SECTION DTL.
1/2" = 1'-0"



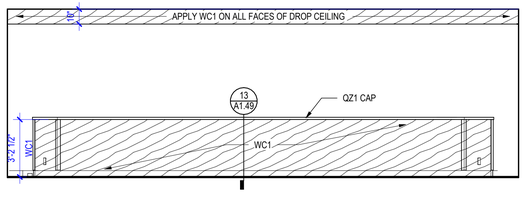
8 3601 DEPT. DESK - NORTH
1/4" = 1'-0"



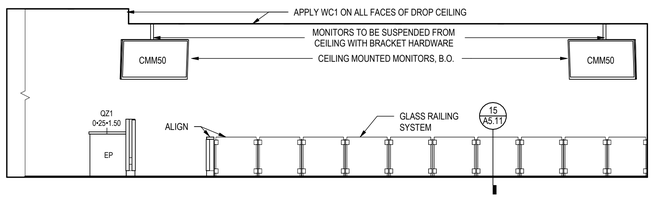
7 3601 COUNCIL CHAMBER DIAS - WEST
1/4" = 1'-0"



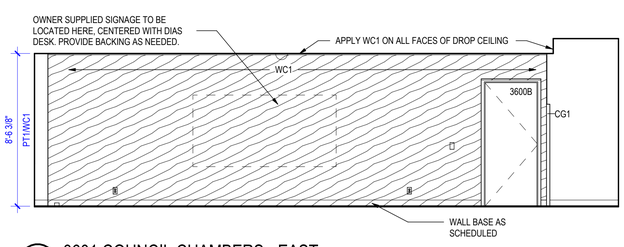
6 3601 DEPT. DESK - WEST
1/4" = 1'-0"



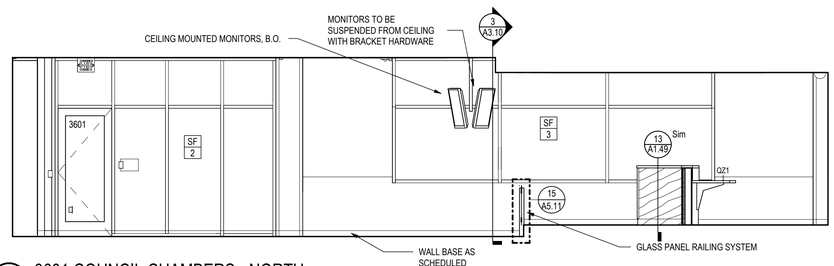
5 3601 COUNCIL CHAMBER DIAS - EAST
1/4" = 1'-0"



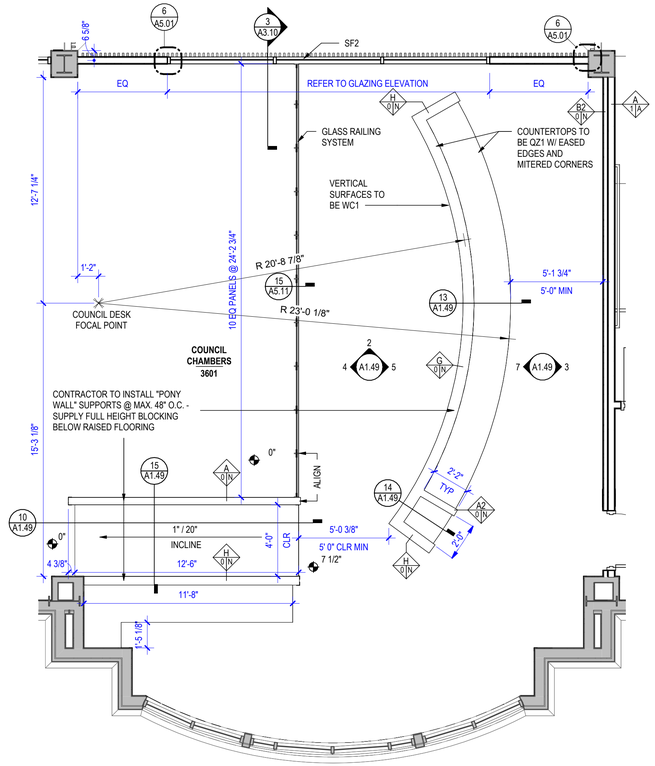
4 3601 COUNCIL CHAMBERS - WEST
1/4" = 1'-0"



3 3601 COUNCIL CHAMBERS - EAST
1/4" = 1'-0"



2 3601 COUNCIL CHAMBERS - NORTH
1/4" = 1'-0"



1 3RD FLOOR ENLARGED PLAN - COUNCIL CHAMBERS
1/4" = 1'-0"

NORTH

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360 Westfield Avenue
Suite 401
Waterloo, IA 50701
319.233.8419
www.invisionarch.com

CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR ENLARGED PLAN & INTERIOR ELEVATIONS - COUNCIL CHAMBERS

SHEET:
A1.49

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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • 1
24 • 24 • 34.5

- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

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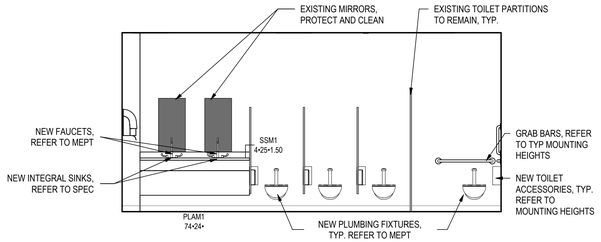
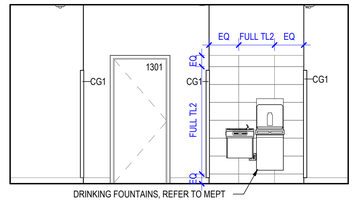


14 EXISTING WOMENS RR, TYP. - SOUTH
1/4" = 1'-0"



13 RR HALLWAY - WEST, TYP.
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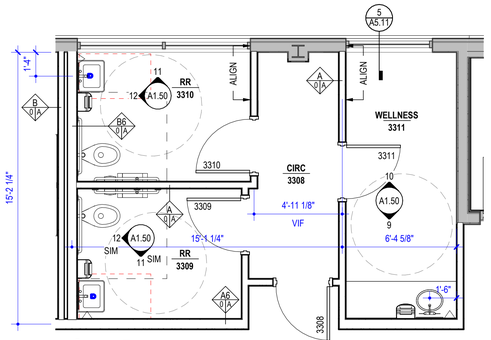
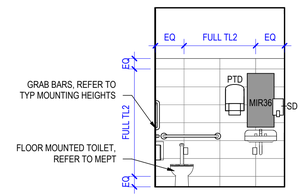
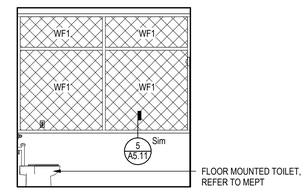


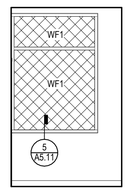
8 ENLARGED PLAN - RESTROOMS & WELLNESS
1/4" = 1'-0"



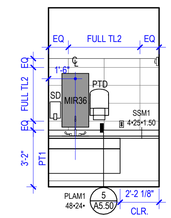
12 3310 RR - WEST
1/4" = 1'-0"



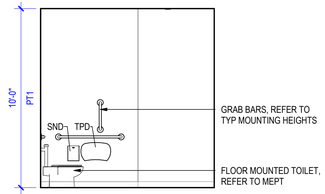
11 3310 RR - NORTH
1/4" = 1'-0"



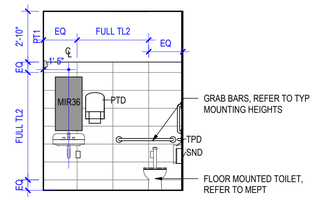
10 3311 WELLNESS - NORTH
1/4" = 1'-0"



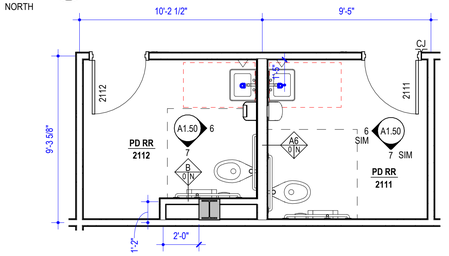
9 3311 WELLNESS - SOUTH
1/4" = 1'-0"



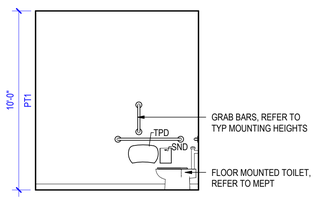
7 2112 PD RR - SOUTH
1/4" = 1'-0"



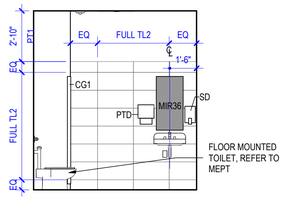
6 2112 PD RR - EAST
1/4" = 1'-0"



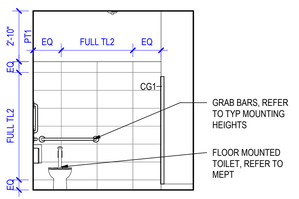
NORTH
5 ENLARGED PLAN - PD RR
1/4" = 1'-0"



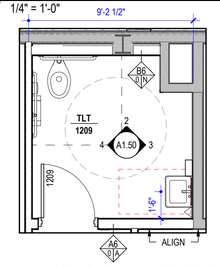
4 1209 TLT - WEST
1/4" = 1'-0"



3 1209 TLT - EAST
1/4" = 1'-0"



2 1209 TLT - NORTH
1/4" = 1'-0"



NORTH
1 ENLARGED PLAN - HOUSING DEPT. RR
1/4" = 1'-0"

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Description	Date	No.

OWNER SIGN-OFF:
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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ENLARGED PLANS & INTERIOR ELEVATIONS - RESTROOMS

SHEET:
A1.50

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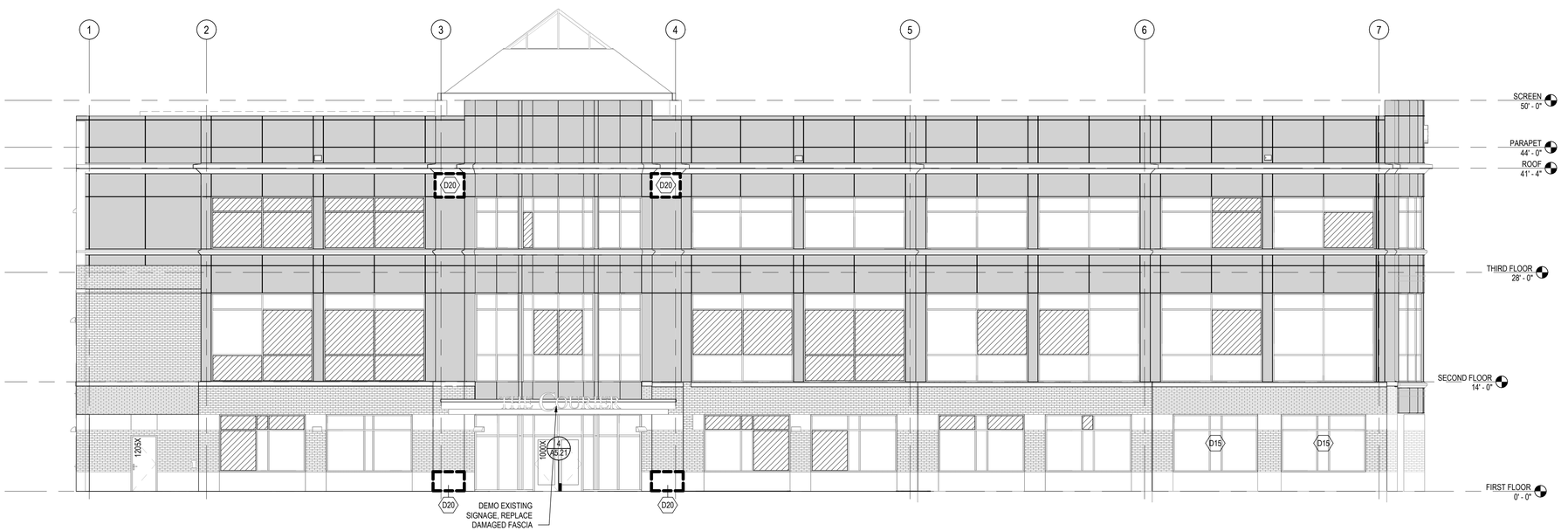
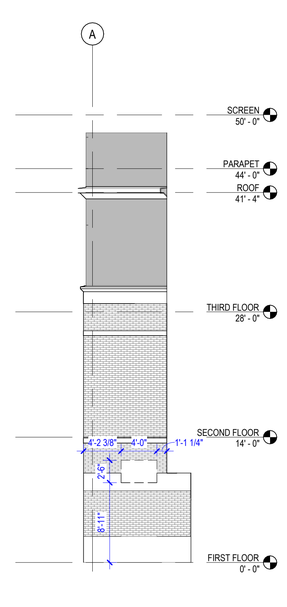
3 EXTERIOR DEMO ELEVATION - SOUTH
1/8" = 1'-0"



2 EXTERIOR DEMO ELEVATION - NORTH
1/8" = 1'-0"



1 EXTERIOR DEMO ELEVATION - EAST
1/8" = 1'-0"

DEMOLITION LEGEND:

1. DASHED LINES INDICATE ITEMS TO BE REMOVED. PATCH AND REPAIR ALL ADJACENT SURFACES TO MATCH EXISTING SURFACES.
2. PROTECT ALL ELEMENTS TO REMAIN, TYPICAL.
3. REFER TO DEMOLITION PLANS AND RCPS FOR ADDITIONAL SCOPE OF WORK.
4. ANY RETURNS OR BLIND ELEVATIONS NOT SHOWN SHALL BE SIMILAR IN MATERIAL AND MAKEUP TO ADJACENT CONDITIONS OR OTHER SIMILAR CONDITIONS.

DEMOLITION KEYNOTES

#	DESCRIPTION
D01	DEMO ALL FLOOR FINISHES U.N.O.
D02	DEMO ALL CEILING TILE U.N.O.
D03	ESTIMATED CONC. SLAB DEMO AREA. COORDINATE WITH PLUMBING PLANS. SEE NOTE.
D07	DEMO EXISTING INTERIOR DOOR PANELS AND HARDWARE. EXISTING FRAMES TO REMAIN.
D08	SALVAGE CEILING MOUNTED TIME CAPSULE TO OWNER.
D09	DEMO RECEPTION COUNTER, BULKHEAD, & WALL BELOW.
D10	SALVAGE ALUM. STOREFRONT AND DOORS FOR REINSTALLATION.
D11	DEMO EXISTING VISUAL DISPLAY.
D12	ALT. 1 : EXISTING OPERABLE PARTITION TO REMAIN, PROTECT.
D13	SALVAGE EXISTING PROJECTION SCREEN TO OWNER.
D14	DEMO EXISTING H.M. FRAMES & TRANSOM WINDOWS ABOVE DOOR, & EXTENT OF EXISTING WALL BELOW.
D15	ALT. 1 : COMPLETELY REMOVE EXISTING WINDOW UNIT.
D16	DEMO EXISTING FLOOR FINISHES AT LANDINGS, TREADS, AND RISERS. CLEAN AND PREPARE ALL FLOOR SURFACES FOR NEW FINISHES.
D17	PROTECT EXISTING TILE FLOOR AND BASE.
D18	EXISTING OPERABLE PARTITION TO REMAIN, PROTECT.
D19	DEMO EXISTING CASEWORK, COUNTERTOP, AND SINK.
D20	REMOVE EXTERIOR CLADDING, PROTECT FOR REINSTALLATION. REMOVE EXISTING BACKUP ASSEMBLY TO PROVIDE ACCESS TO STRUCTURAL STEEL. REPLACE BACKUP MATERIAL CONSISTENT WITH ADJACENT. VERIFY WEATHER BARRIER CONTINUITY. REINSTALL EXTERIOR CLADDING.
D21	REVIEW SILLS WITH OWNER FOR DEMO AND REPLACEMENT
D22	DEMO COUNTERTOP, SINKS, TOILETS. PROTECT PARTITIONS.
D23	DEMO TOILETS, URINALS, FAUCETS. PROTECT PARTITIONS.
D24	DEMO WALLS AS REQUIRED TO COMPLETE STRUCTURAL MODIFICATIONS
D25	REMOVE EXISTING ROOF, INSULATION, AND ACCESSORIES COMPLETE TO STRUCTURAL DECK BELOW, PREPARE FOR NEW ROOFING

GLAZING REPLACEMENT:

ALL HATCHED GLAZING PANELS TO BE REPLACED WITH NEW IGU TO MATCH EXISTING

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WATERLOO, IA

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SHEET SET:
BID DOCUMENTS

SHEET NAME:
EXTERIOR DEMO ELEVATIONS 4TH ST & 5TH ST

SHEET:
AD2.01

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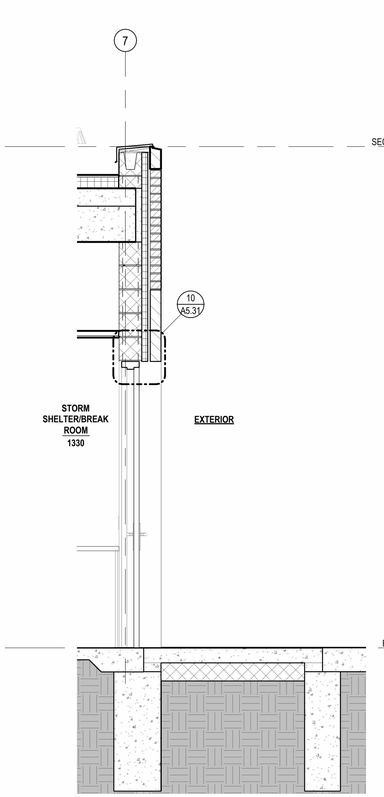
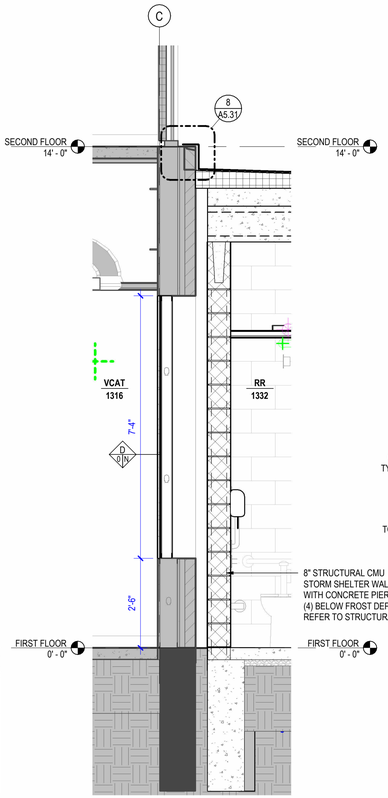
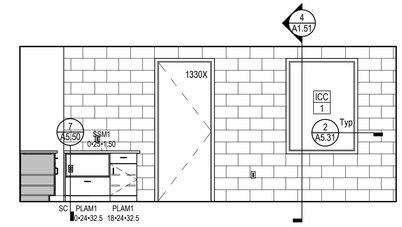


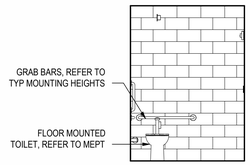
8 SS EXT WALL AT DOOR - EAST
1/2" = 1'-0"



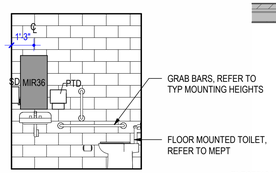
7 SS AT EXIST. EXT WALL - NORTH
1/2" = 1'-0"



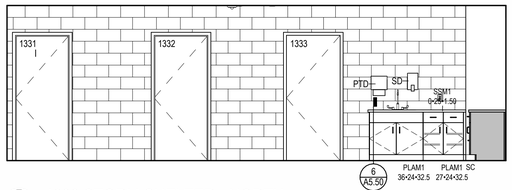
11 1330 STORM SHELTER - EAST
1/4" = 1'-0"



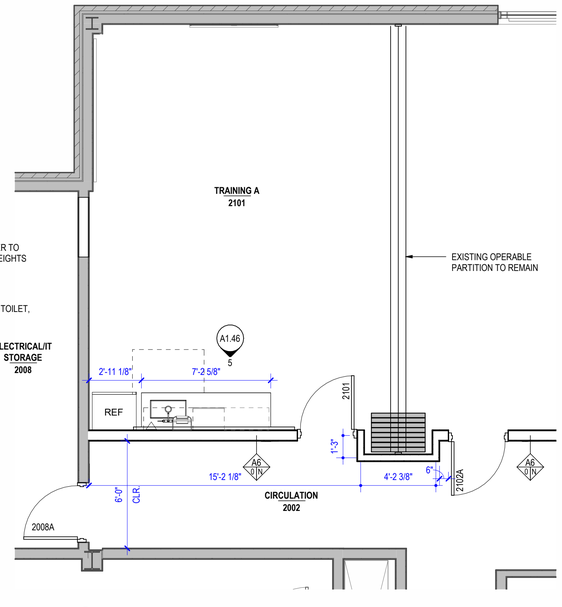
10 1332 RR - EAST
1/4" = 1'-0"



9 1332 RR - NORTH
1/4" = 1'-0"



6 1330 STORM SHELTER - NORTH
1/4" = 1'-0"



TRUE NORTH
PLAN NORTH

5 2ND FLOOR PLAN - TRAINING ROOM ALTERNATE
1/4" = 1'-0"

GENERAL INTERIOR ELEVATION NOTES:

1. REFER TO ADDITIONAL NOTES AND REQUIREMENTS ON ALL OTHER DOCUMENTS, OTHER DISCIPLINES AND SPECIFICATIONS.
2. ALL PLUMBING FIXTURES SHOWN ON THIS SHEET ARE PROVIDED FOR COORDINATION PURPOSES ONLY. REFER TO PLUMBING DOCUMENTS FOR SPECIFIC DESIGN INFO.
3. ALL REST ROOMS, FIXTURES & ACCESSORIES SHALL BE COMMERCIAL GRADE AND SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT.
4. PROVIDE ADEQUATE BLOCKING FOR ALL REST ROOM FIXTURES, EQUIPMENT AND WALL MOUNTED ITEMS.
5. ELECTRICAL OUTLETS AND COMMUNICATION RECEPTACLES SHOWN ON ARCHITECTURAL DRAWINGS DO NOT INCLUDE THE ENTIRE SCOPE OF WORK AND ARE SHOWN WHERE THERE MAY BE COORDINATION ISSUES WITH OTHER WORK. FOR FURTHER CLARIFICATION, CONSULT ELECTRICAL DRAWINGS.

GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • V-L
24 • 24 • 34.5

- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

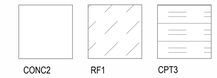
COUNTERTOP TAG

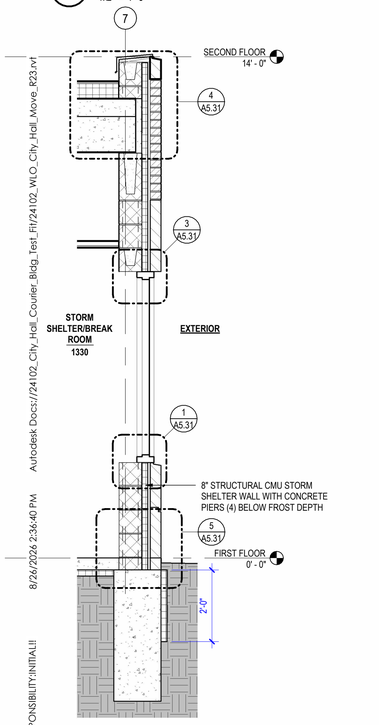
PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

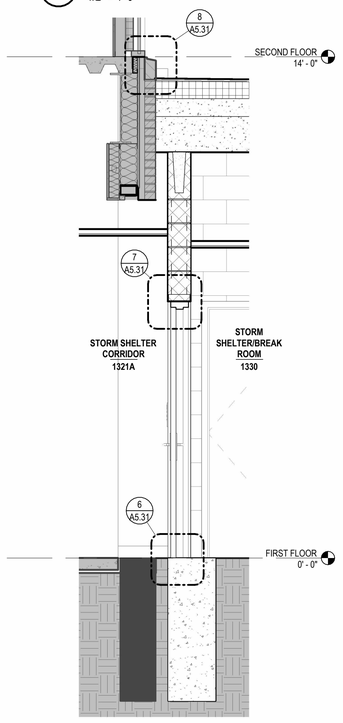
1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, SPECIFICATION, AND EXISTING FIELD CONDITIONS.
4. PROVIDE ADEQUATE BLOCKING FOR ALL CABINETS, FIXTURES, AND EQUIPMENT.
5. ALL EXPOSED AND SEMI-EXPOSED SURFACES TO RECEIVE FINISHED EDGES/PANELS TO MATCH ADJACENT SURFACES.
6. ALL EXPOSED WOOD TO BE SEALED PER FINISH SCHEDULE AND SPECIFICATION.
7. ALL EXPOSED STEEL TO BE PAINTED PER FINISH SCHEDULE AND SPECIFICATION.
8. SEE FINISH SCHEDULE FOR ALL PLAM SELECTIONS.
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.

FINISH FLOOR LEGEND:

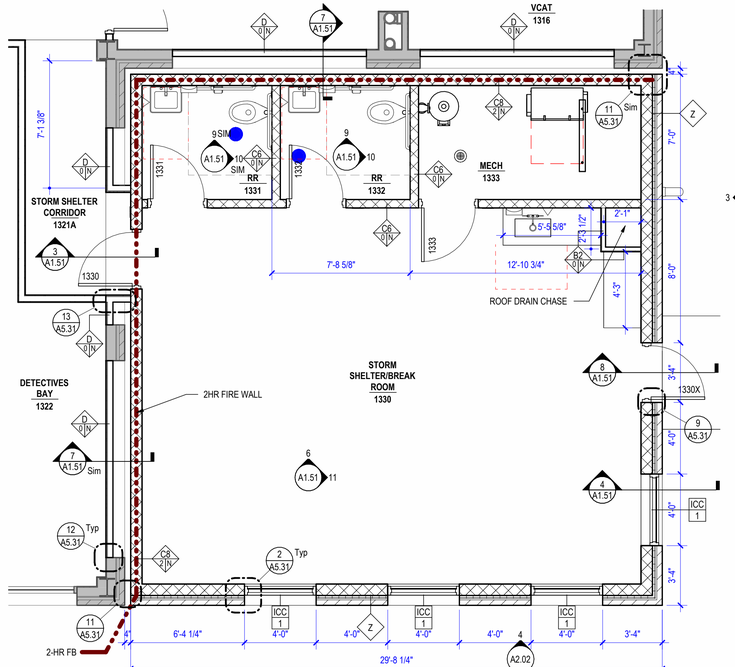




4 SS EXT WALL AT WINDOW - EAST
1/2" = 1'-0"

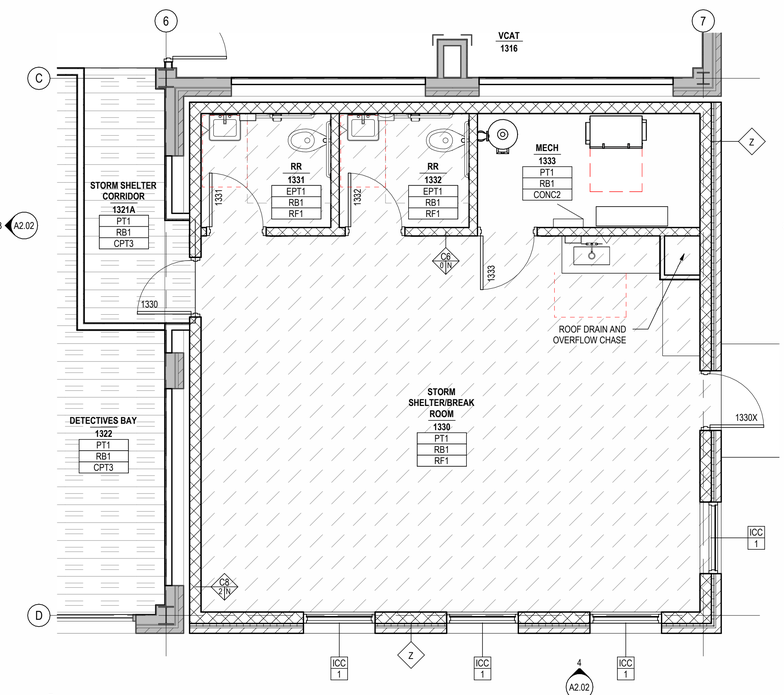


3 SS INTERIOR DOOR - WEST
1/2" = 1'-0"



TRUE NORTH
PLAN NORTH

2 ENLARGED PLAN - STORM SHELTER
1/4" = 1'-0"



TRUE NORTH
PLAN NORTH

1 STORM SHELTER FINISH PLAN
1/4" = 1'-0"

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WATERLOO, IA

PROJECT NO: 24102

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SHEET SET: BID DOCUMENTS

SHEET NAME: ENLARGED PLANS & INTERIOR ELEVATIONS - ALTERNATES

SHEET: A1.51

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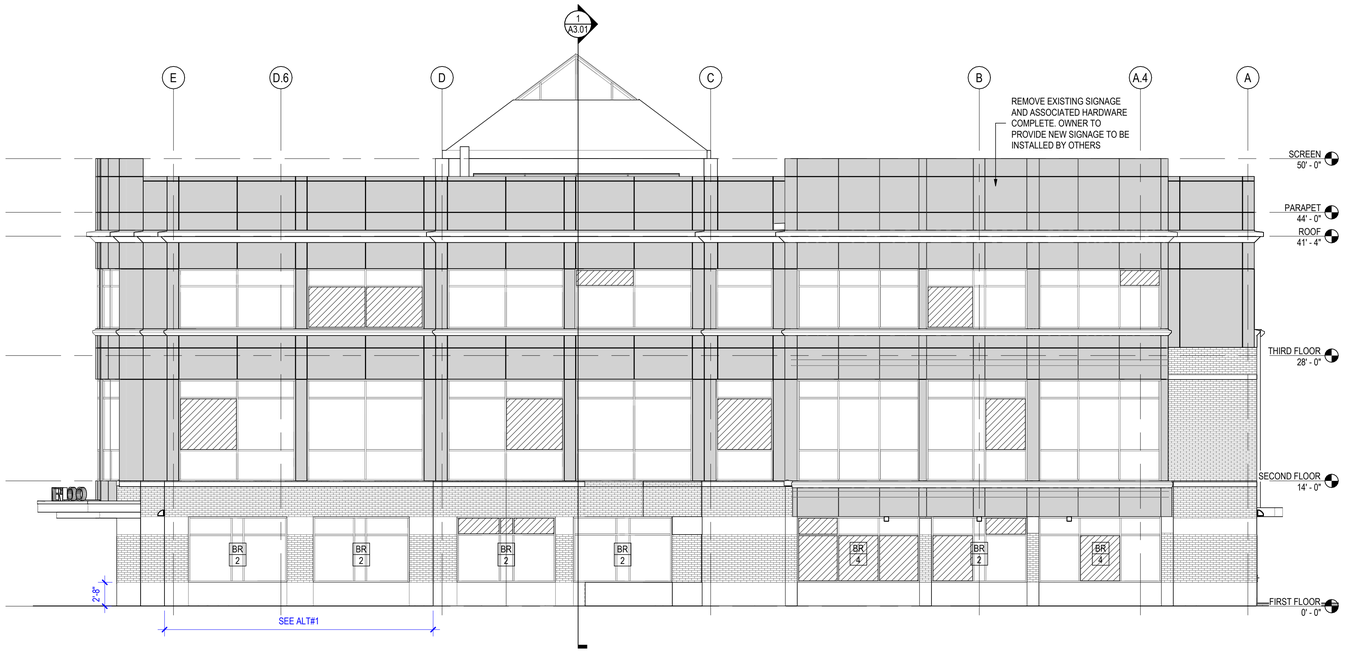
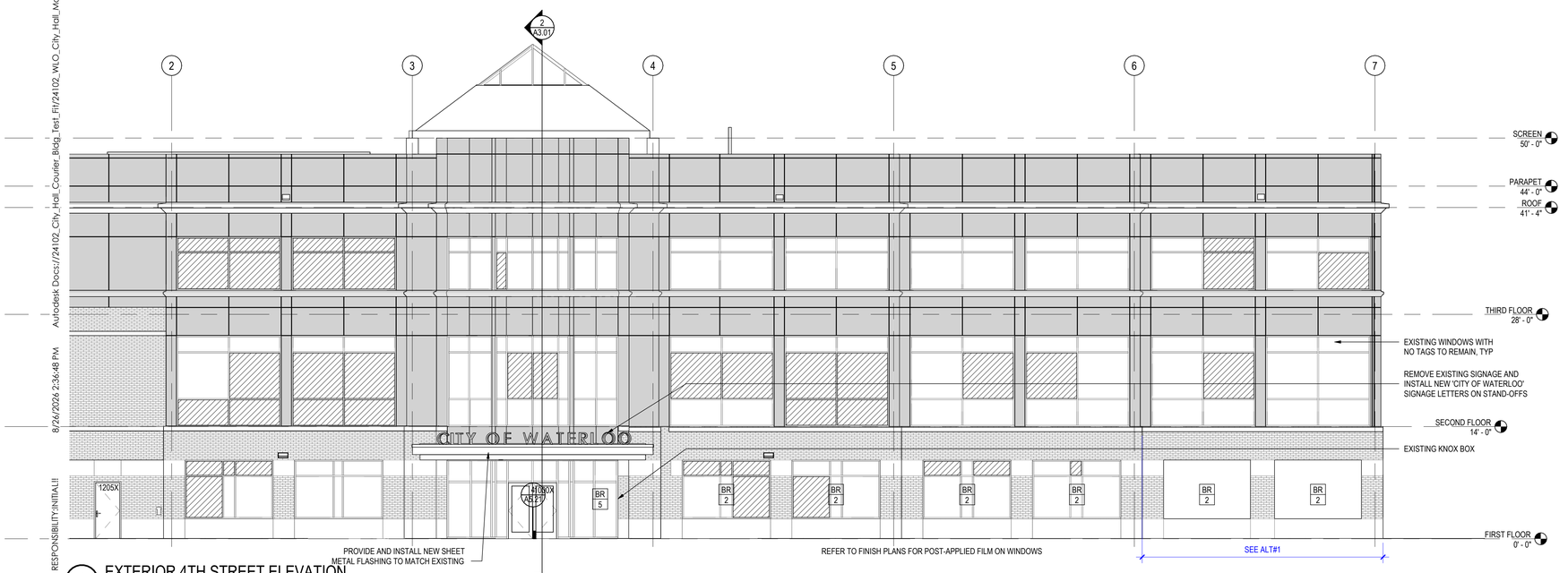


2 EXTERIOR RIVER SIDE ELEVATION
1/8" = 1'-0"



1 EXTERIOR 4TH STREET ELEVATION
1/8" = 1'-0"

GENERAL ELEVATION NOTES:

1. ALL EXTERIOR WINDOWS MUST BE FULLY CLEANED ON INSIDE AND OUTSIDE PRIOR TO COMPLETION OF PROJECT.
2. SEE ARCHITECTURAL FLOOR PLANS FOR WALL TYPES, WINDOW NUMBERS, DOOR NUMBERS, AND DIMENSIONS.
3. PLACEMENT OF WALL MOUNTED ITEMS (FIRE STROBE, DOOR OPERATOR BUTTON, WALL HYDRANTS, ETC) ARE DIMENSIONED TO CENTERLINE OF ITEM.
4. HATCHED AREA IS FOR REFERENCE ONLY.
5. ANY RETURNS OR BLIND ELEVATIONS NOT SHOWN SHALL BE SIMILAR IN MATERIAL AND MAKEUP TO ADJACENT CONDITIONS OR OTHER SIMILAR CONDITIONS.
6. ALT. #3 - REPLACE EXISTING ALUM. STOREFRONT FRAMES AND GLAZING W/ NEW BULLET RESISTANT ALUMINUM FRAMES AND GLAZING. MATCH EXISTING SIZE AND LAYOUTS. SEE SPEC.

GLAZING REPLACEMENT:

ALL HATCHED GLAZING PANELS TO BE REPLACED WITH NEW IGU TO MATCH EXISTING

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WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: EXTERIOR ELEVATIONS 4TH ST & RIVER

SHEET: A2.01

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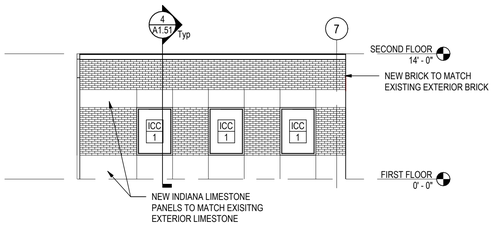
GENERAL ELEVATION NOTES:

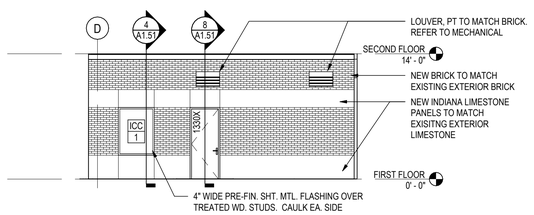
1. ALL EXTERIOR WINDOWS MUST BE FULLY CLEANED ON INSIDE AND OUTSIDE PRIOR TO COMPLETION OF PROJECT.
2. SEE ARCHITECTURAL FLOOR PLANS FOR WALL TYPES, WINDOW NUMBERS, DOOR NUMBERS, AND DIMENSIONS.
3. PLACEMENT OF WALL MOUNTED ITEMS (FIRE STROBE, DOOR OPERATOR BUTTON, WALL HYDRANTS, ETC) ARE DIMENSIONED TO CENTERLINE OF ITEM.
4. HATCHED AREA IS FOR REFERENCE ONLY.
5. ANY RETURNS OR BLIND ELEVATIONS NOT SHOWN SHALL BE SIMILAR IN MATERIAL AND MAKEUP TO ADJACENT CONDITIONS OR OTHER SIMILAR CONDITIONS.
6. ALT. #3 - REPLACE EXISTING ALUM. STOREFRONT FRAMES AND GLAZING W/ NEW BULLET RESISTANT ALUMINUM FRAMES AND GLAZING. MATCH EXISTING SIZE AND LAYOUTS. SEE SPEC.

GLAZING REPLACEMENT:

ALL HATCHED GLAZING PANELS TO BE REPLACED WITH NEW IGU TO MATCH EXISTING

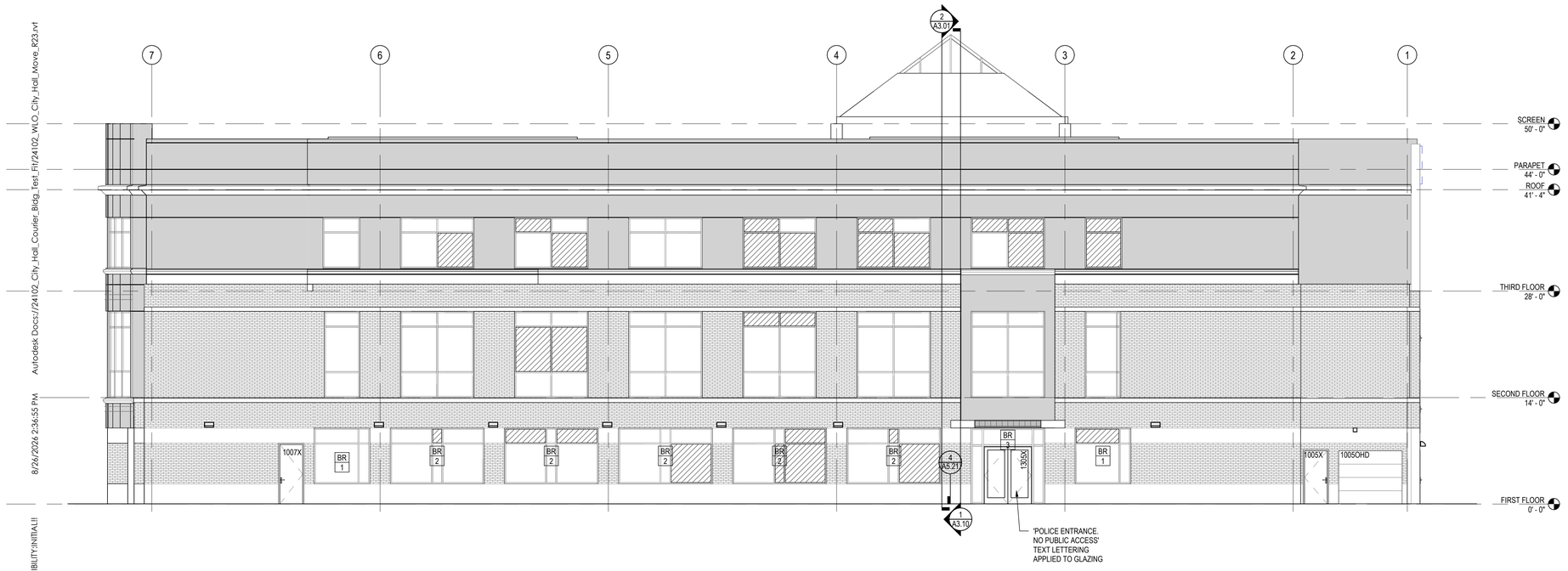


4 EXTERIOR ELEVATION - STORM SHELTER - SOUTH
1/8" = 1'-0"

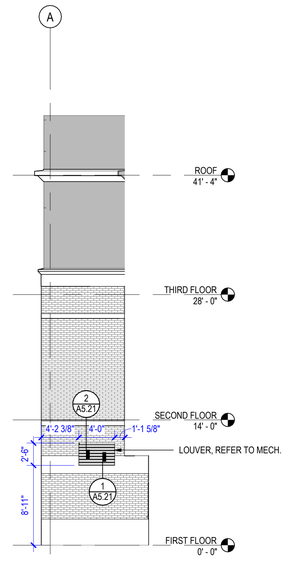


3 EXTERIOR ELEVATION - STORM SHELTER - EAST
1/8" = 1'-0"

ALTERNATE 1 : STORM SHELTER EXTERIOR ELEVATIONS



2 EXTERIOR 5TH STREET ELEVATION
1/8" = 1'-0"



1 EXTERIOR ELEVATION - EAST
1/8" = 1'-0"

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WATERLOO, IA

PROJECT NO:
24102

DATE:
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SHEET NAME:
EXTERIOR ELEVATIONS
5TH STREET AND
ALTERNATE 1

SHEET:
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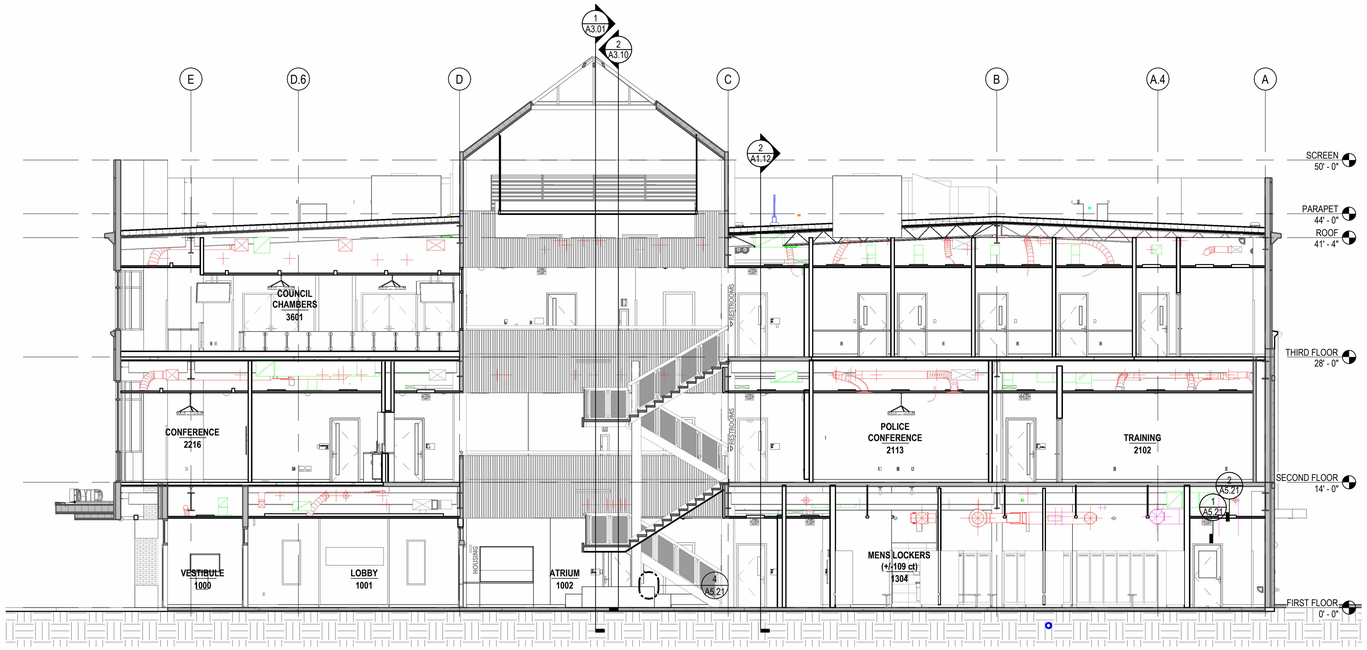
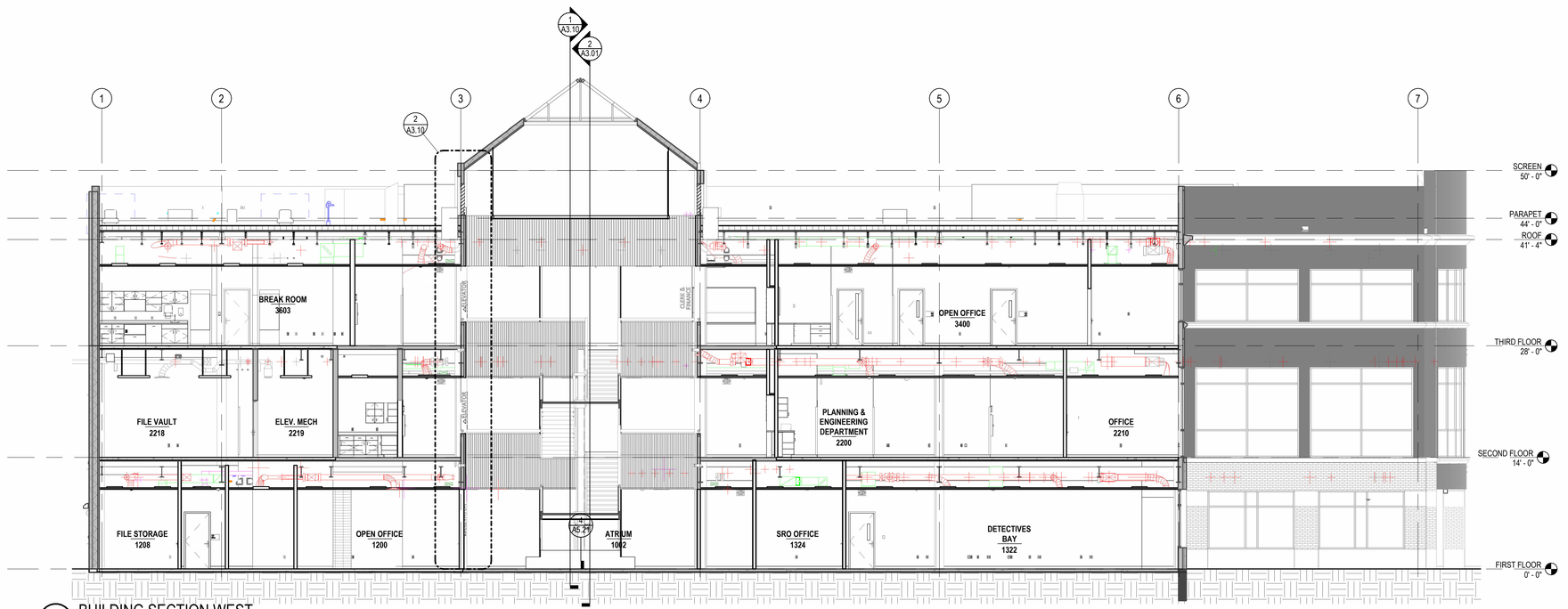


2 BUILDING SECTION NORTH
1/8" = 1'-0"



1 BUILDING SECTION WEST
1/8" = 1'-0"

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8/26/2026

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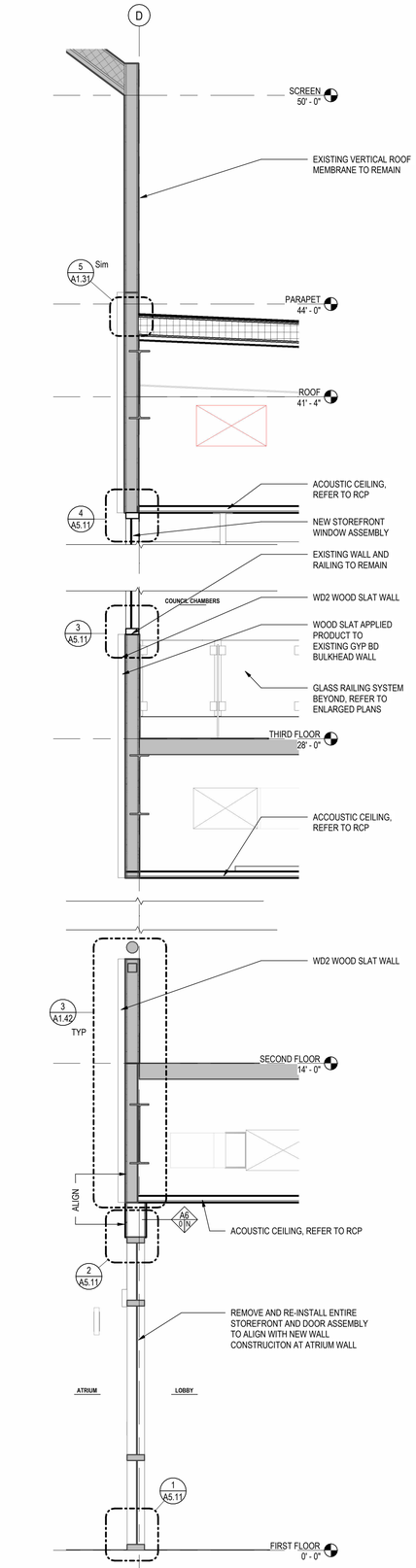
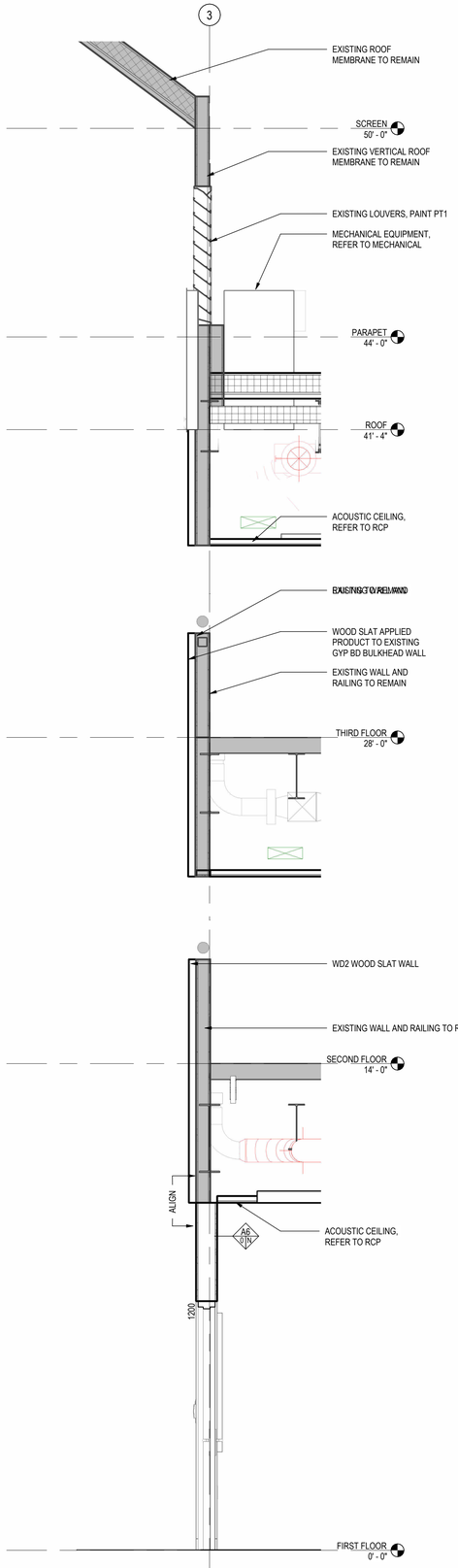
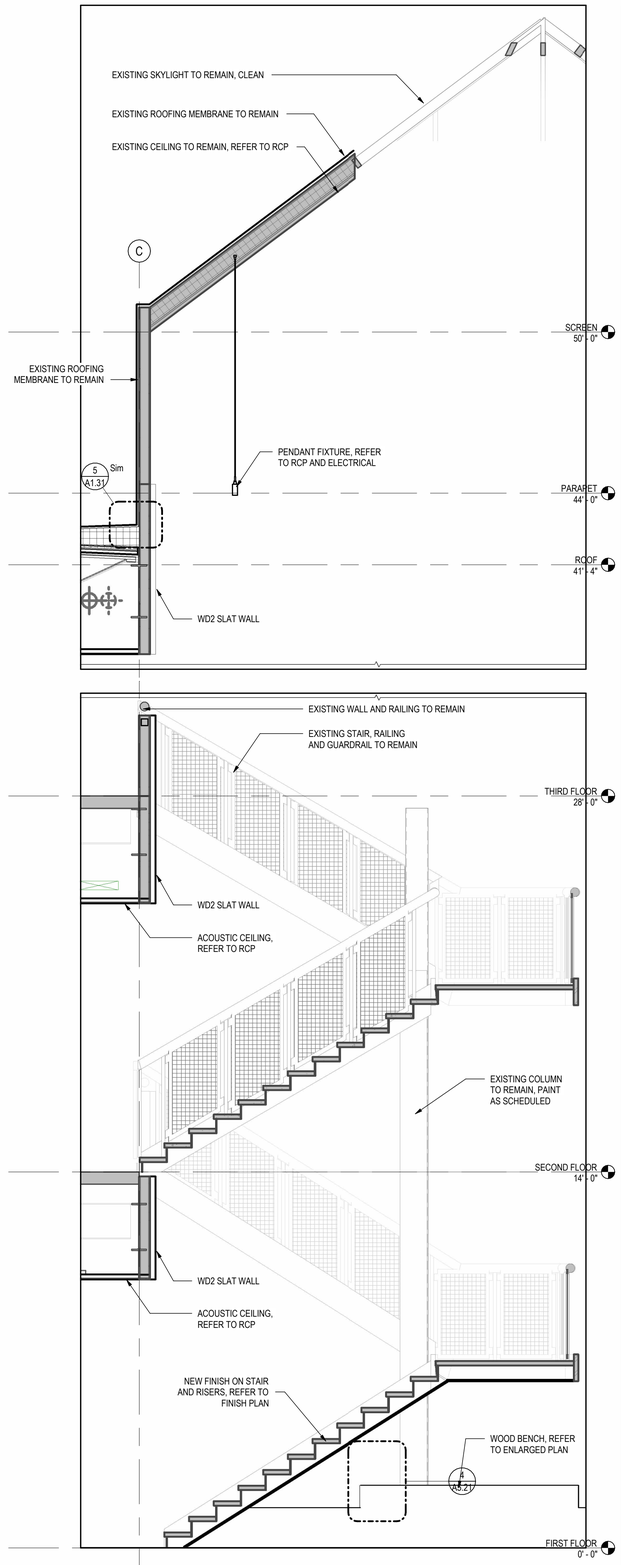


3 ATRIUM ENTRANCE WALL SECTION SOUTH
1/2" = 1'-0"



2 ATRIUM WALL SECTION - WEST
1/2" = 1'-0"



1 ATRIUM STAIR WALL SECTION SOUTH
3/8" = 1'-0"

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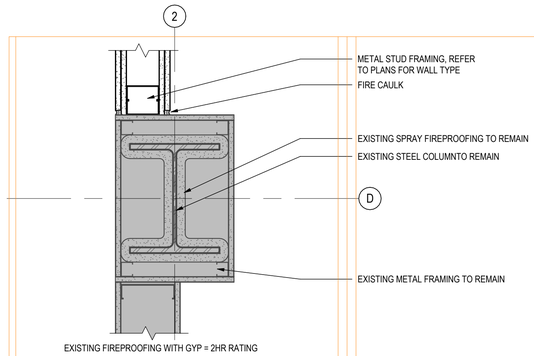
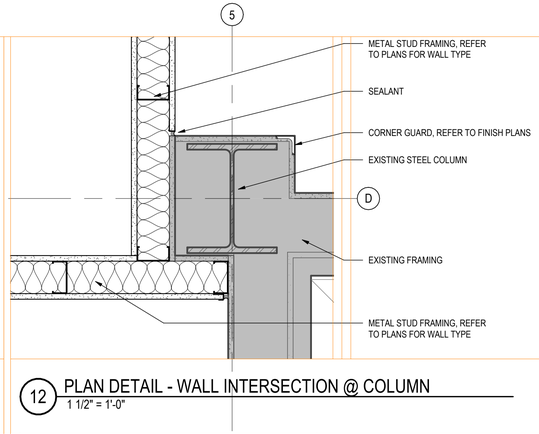
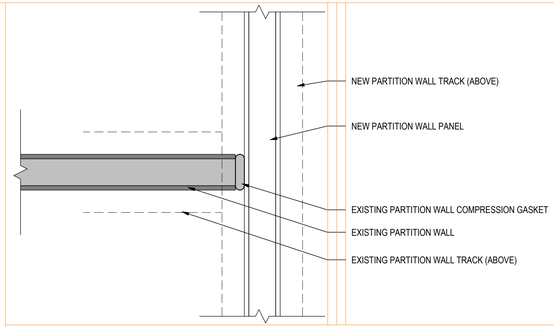


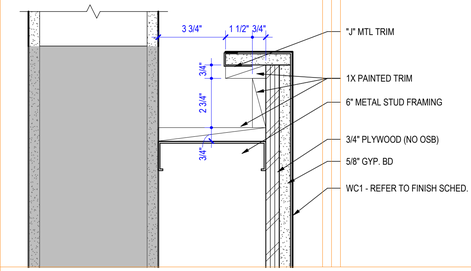
16 PLAN DETAIL - 2HR COLUMN WRAP
1 1/2" = 1'-0"



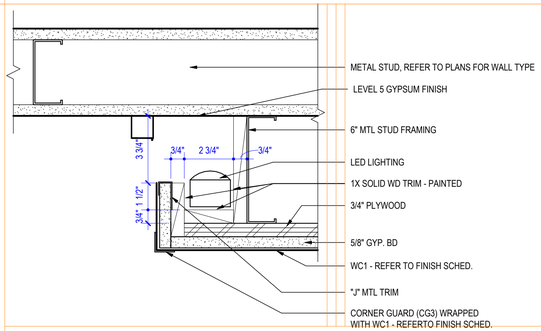
12 PLAN DETAIL - WALL INTERSECTION @ COLUMN
1 1/2" = 1'-0"



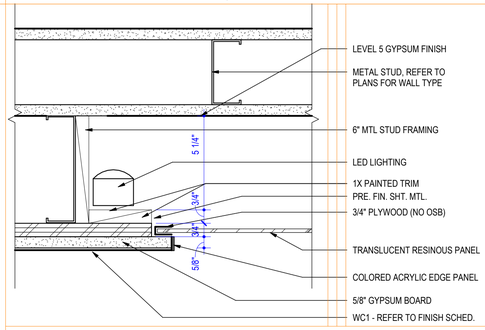
8 PLAN DETAIL - MOLLENHOFF PARTITION INTERSECT
1 1/2" = 1'-0"

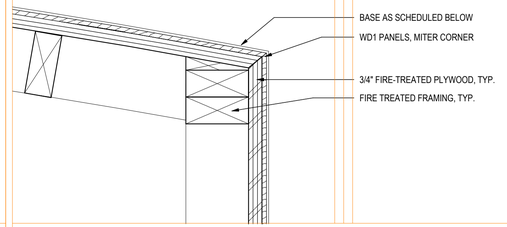


4 PLAN DETAIL - LOBBY WAYFINDING PANELS
3" = 1'-0"

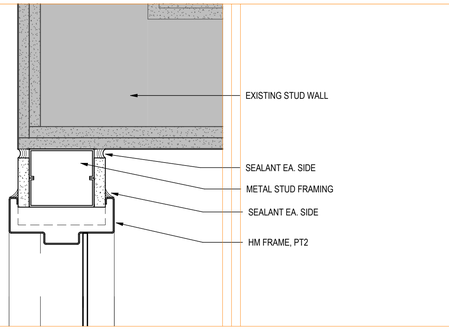


15 PLAN DETAIL - WAYFINDING WALL EDGE
3" = 1'-0"

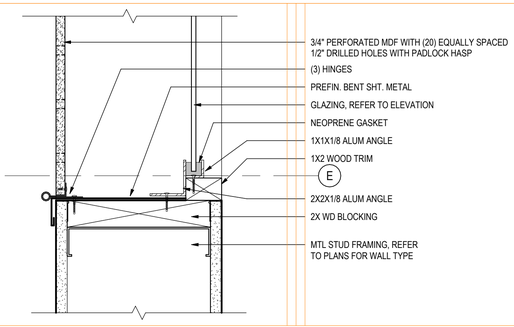




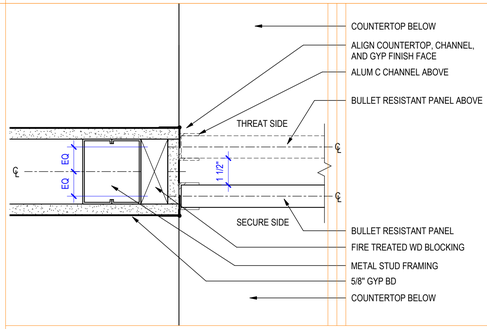
7 PLAN DETAIL - BENCH EDGE
3" = 1'-0"



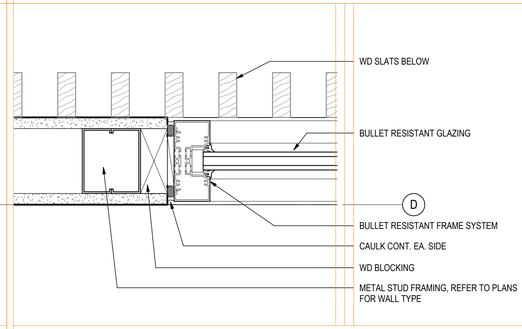
3 PLAN DETAIL - JAMB @ EXISTING
3" = 1'-0"



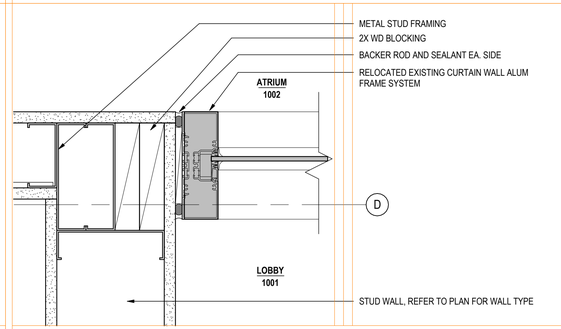
14 PLAN DETAIL - JAMB AT TV GLAZING
3" = 1'-0"



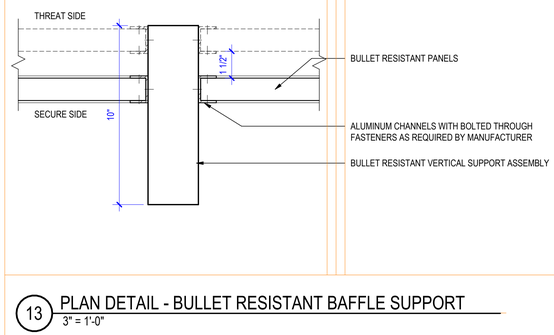
10 PLAN DETAIL - BULLET RESISTANT BAFFLE JAMB TYP
3" = 1'-0"



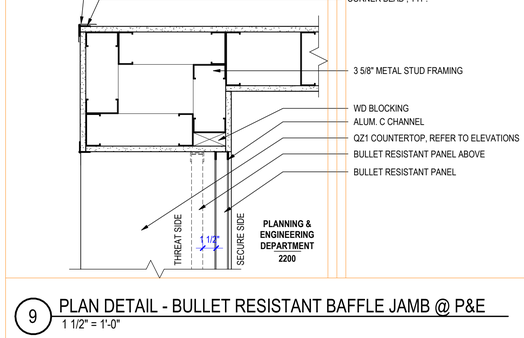
6 PLAN DETAIL - JAMB AT BULLET RESISTANT SF
3" = 1'-0"



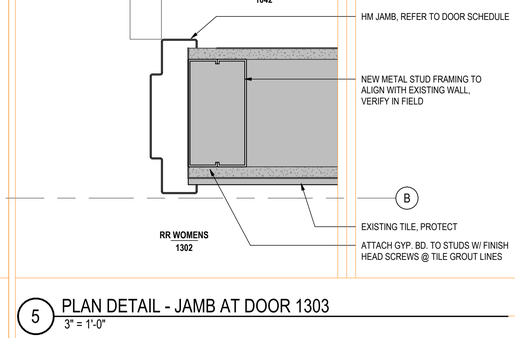
2 PLAN DETAIL - JAMB AT RELOCATED SF
3" = 1'-0"



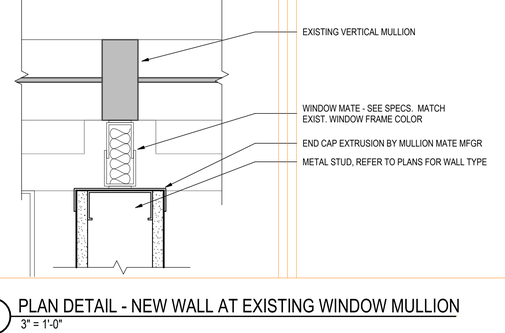
13 PLAN DETAIL - BULLET RESISTANT BAFFLE SUPPORT
3" = 1'-0"



9 PLAN DETAIL - BULLET RESISTANT BAFFLE JAMB @ P&E
1 1/2" = 1'-0"



5 PLAN DETAIL - JAMB AT DOOR 1303
3" = 1'-0"



1 PLAN DETAIL - NEW WALL AT EXISTING WINDOW MULLION
3" = 1'-0"

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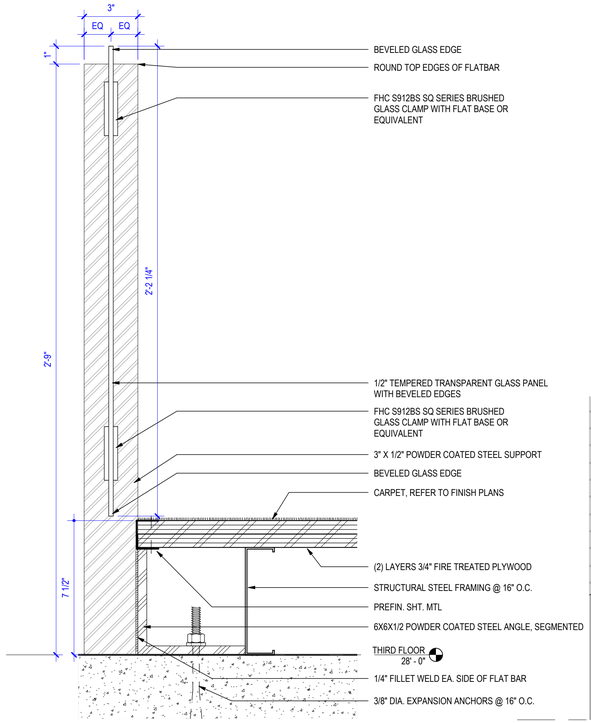
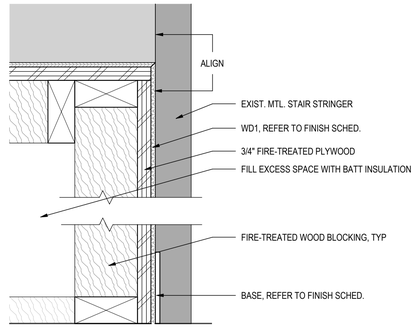
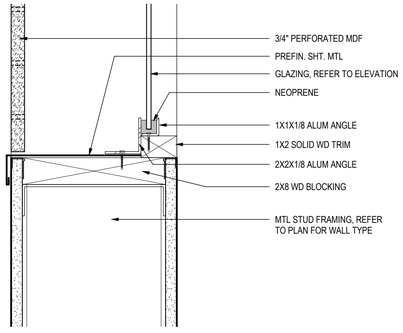


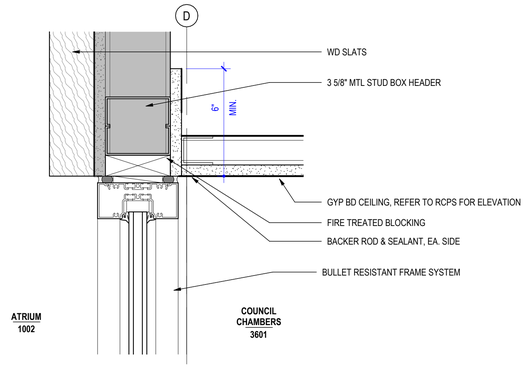
15 SECTION DETAIL - COUNCIL CHAMBERS PLATFORM EDGE
3" = 1'-0"



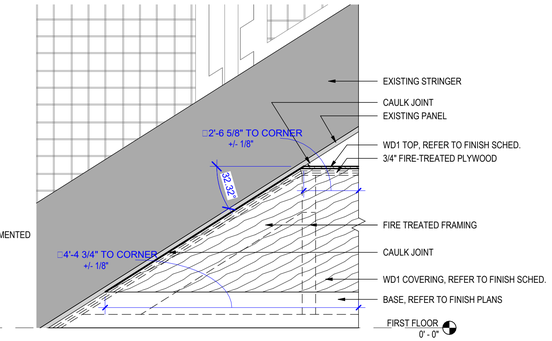
12 SECTION DETAIL - PLINTH ALIGN
3" = 1'-0"



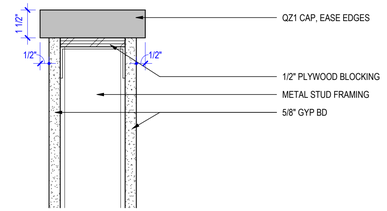
8 SECTION DETAIL - VESTIBULE WINDOW SILL
3" = 1'-0"



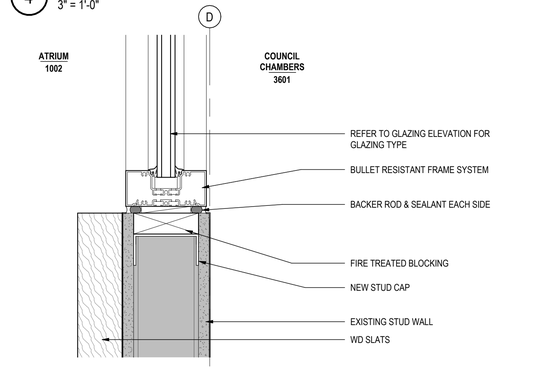
4 SECTION DETAIL - COUNCIL CHAMBERS SF HEAD
3" = 1'-0"



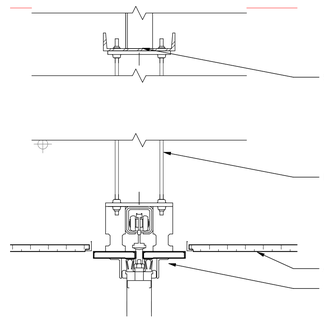
11 SECTION DETAIL - PLINTH TRANSITION
1 1/2" = 1'-0"



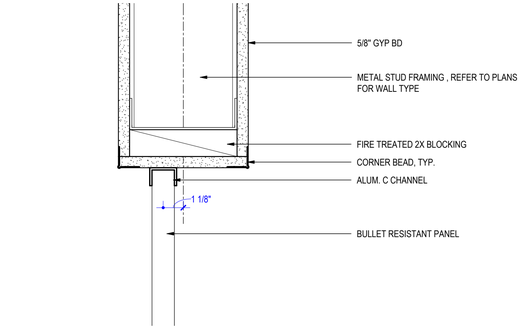
7 SECTION DETAIL - CC WALL CAP - TYP
3" = 1'-0"



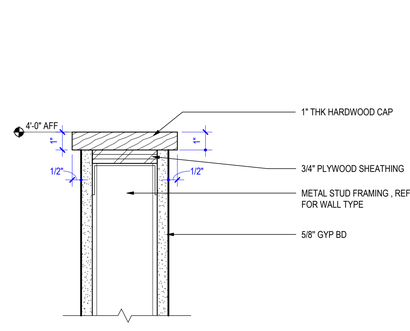
3 SECTION DETAIL - COUNCIL CHAMBERS SF SILL
3" = 1'-0"



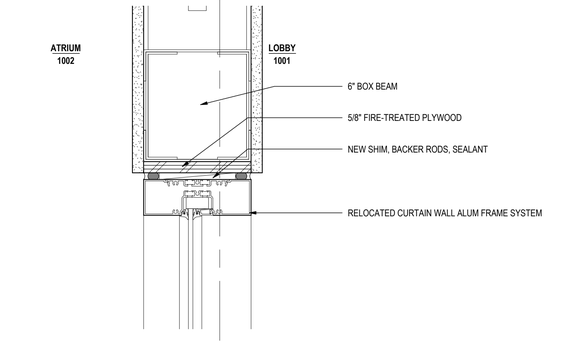
14 SECTION DETAIL - MOLLENHOFF PARTITION HEAD
1 1/2" = 1'-0"



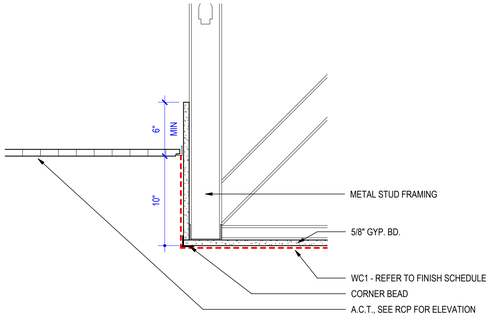
10 SECTION DETAIL - BULLET RESISTANT BAFFLE HEAD
3" = 1'-0"



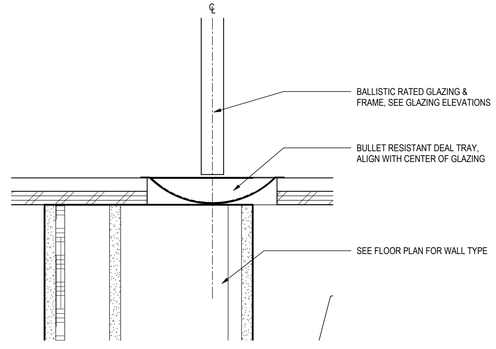
6 SECTION DETAIL - CHIEF SECRETARY WALL CAP
3" = 1'-0"



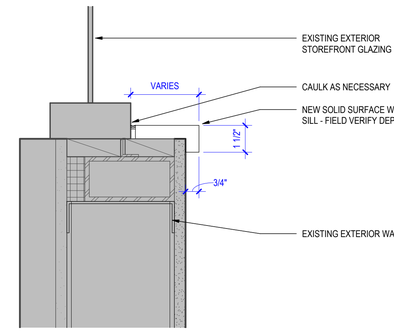
2 SECTION DETAIL - RELOCATED SF HEAD
3" = 1'-0"



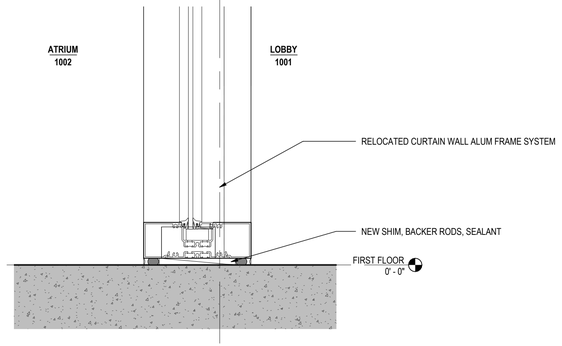
13 SECTION DETAIL - COUNCIL CHAMBERS BULKHEAD
1 1/2" = 1'-0"



9 SECTION DETAIL - BULLET RESISTANT BAFFLE SILL
3" = 1'-0"



5 SECTION DETAIL - SSM SILL
3" = 1'-0"



1 SECTION DETAIL - RELOCATED SF THRESHOLD
3" = 1'-0"

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4 SECTION DETAIL - RECEPTACLE TO BE INSTALLED IN PLINTH
1 1/2" = 1'-0"

3 PLAN DETAIL TYP - CONTROL JOINT @ COLUMN
3" = 1'-0"

2 SECTION DETAIL - LOUVER HEAD @ EXISTING
3" = 1'-0"

1 SECTION DETAIL - LOUVER SILL @ EXISTING
3" = 1'-0"

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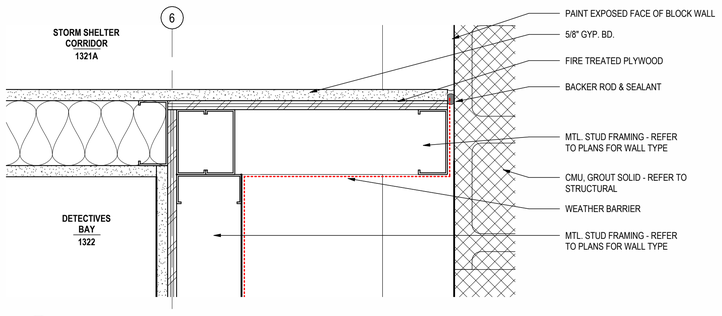
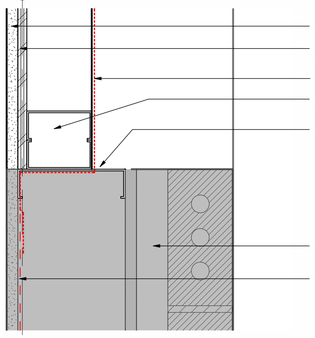
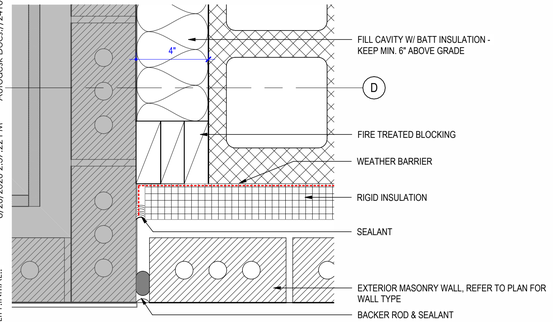


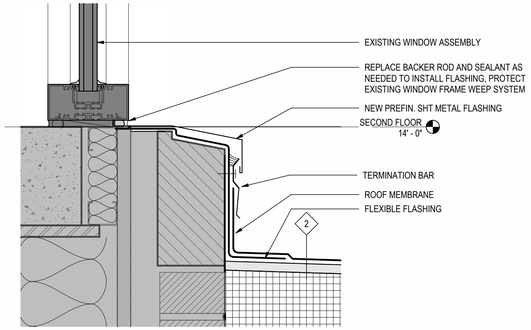
13 PLAN DETAIL - STORM SHELTER GYP
3" = 1'-0"



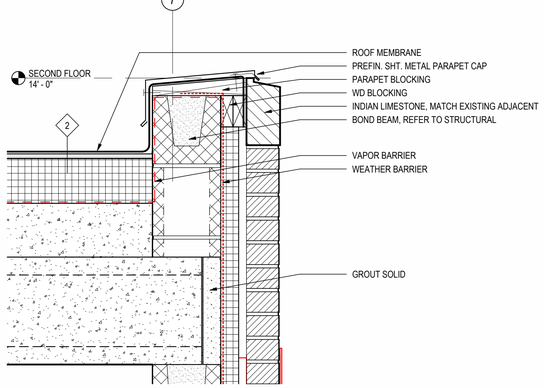
12 PLAN DETAIL - STORM SHELTER INTERIOR CAVITY
3" = 1'-0"



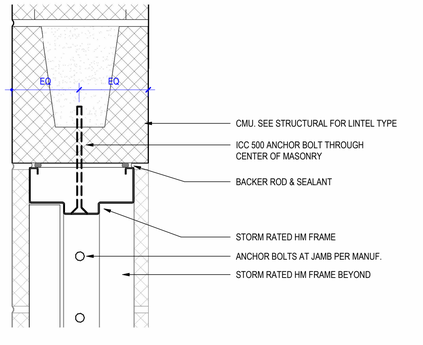
11 PLAN DETAIL - STORM SHELTER EXTERIOR CAVITY
3" = 1'-0"



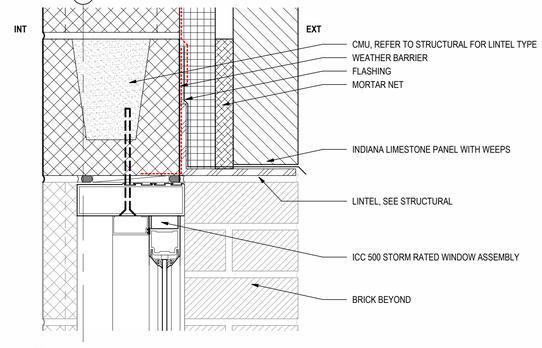
8 SECTION DETAIL - STORM SHELTER ROOF AT EXISTING
3" = 1'-0"



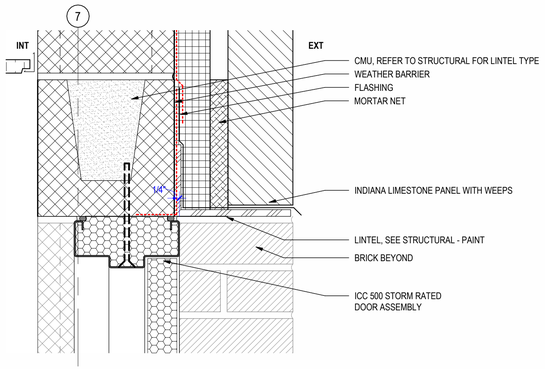
4 SECTION DETAIL - STORM SHELTER PARAPET
1 1/2" = 1'-0"



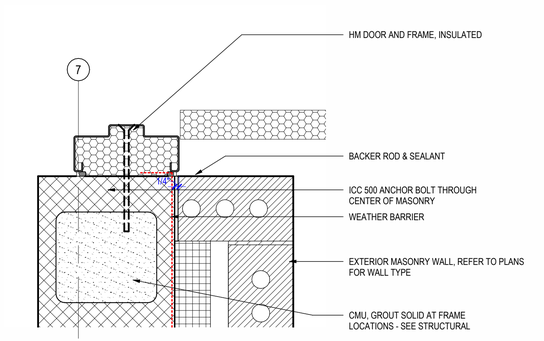
7 SECTION DETAIL - STORM SHELTER DOOR HEAD
3" = 1'-0"



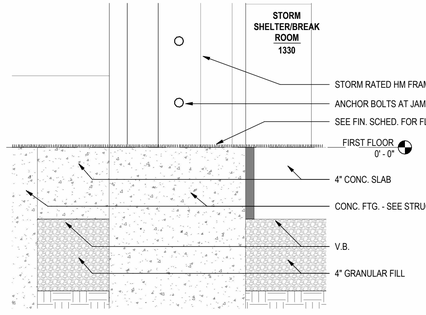
3 SECTION DETAIL - STORM SHELTER WINDOW HEAD
3" = 1'-0"



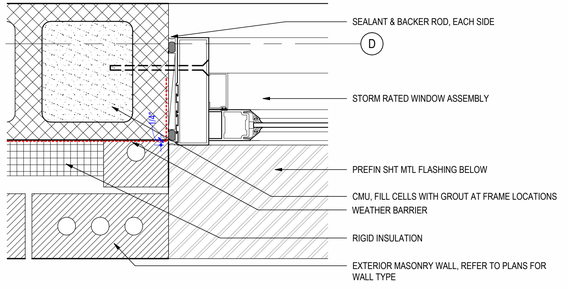
10 SECTION DETAIL - STORM SHELTER EXTERIOR HM HEAD
3" = 1'-0"



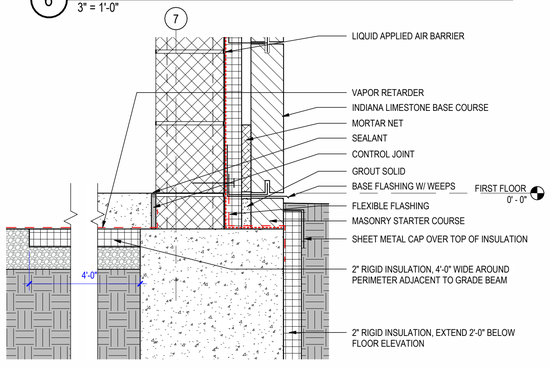
9 PLAN DETAIL - STORM SHELTER EXTERIOR HM JAMB
3" = 1'-0"



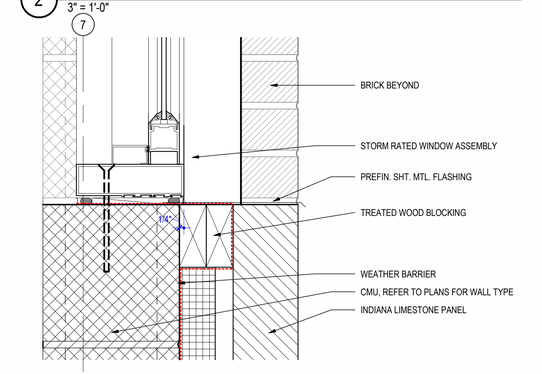
6 SECTION DETAIL - STORM SHELTER DOOR THRESHOLD
3" = 1'-0"



2 PLAN DETAIL - STORM SHELTER WINDOW JAMB
3" = 1'-0"



5 SECTION DETAIL - CMU AT GRADE BEAM
1 1/2" = 1'-0"



1 SECTION DETAIL - STORM SHELTER WINDOW SILL
3" = 1'-0"

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ALTERNATE 1 - STORM SHELTER DETAILS

SHEET:
A5.31

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GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 • V•L
24 • 24 • 34.5

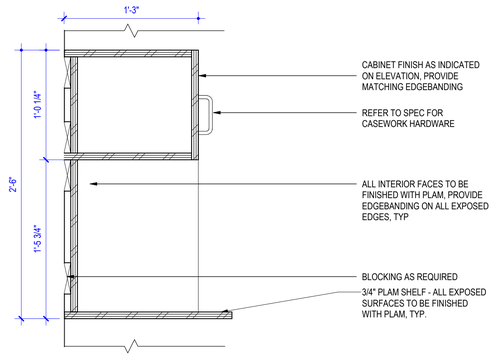
- CUSTOM SIZE
- MATERIAL
- LOCK INDICATOR
- LIGHT VALANCE
- SIZE: W•D•H

COUNTERTOP TAG

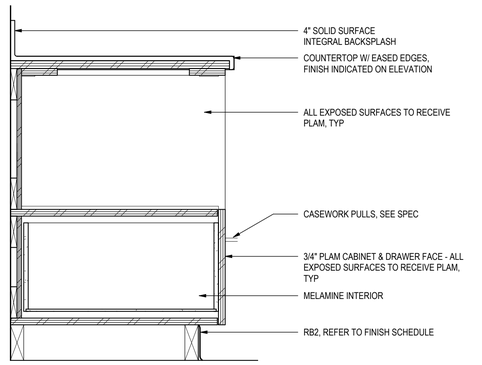
PLAM1
4 • 25 • 1.50

- MATERIAL
- COUNTERTOP THICKNESS
- COUNTERTOP SIZE: D
- BACKSPLASH SIZE: H

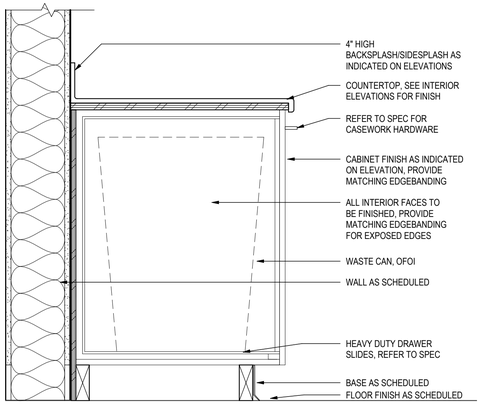
1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
2. ALL FASTENERS TO BE CONCEALED UNLESS OTHERWISE NOTED.
3. DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, SPECIFICATION, AND EXISTING FIELD CONDITIONS.
4. PROVIDE ADEQUATE BLOCKING FOR ALL CABINETS, FIXTURES, AND EQUIPMENT.
5. ALL EXPOSED AND SEMI-EXPOSED SURFACES TO RECEIVE FINISHED EDGES/PANELS TO MATCH ADJACENT SURFACES.
6. ALL EXPOSED WOOD TO BE SEALED PER FINISH SCHEDULE AND SPECIFICATION.
7. ALL EXPOSED STEEL TO BE PAINTED PER FINISH SCHEDULE AND SPECIFICATION.
8. SEE FINISH SCHEDULE FOR ALL PLAM SELECTIONS.
9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.



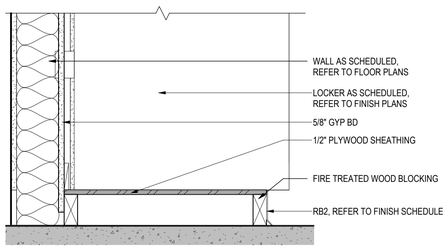
8 UPPER MICROWAVE CABINET, TYP.
1 1/2" = 1'-0"



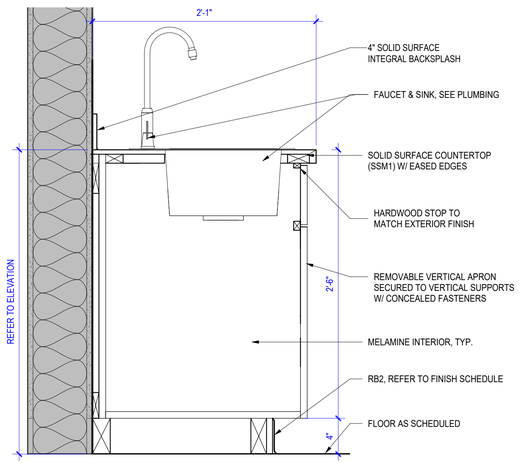
7 MICROWAVE BASE CABINET, TYP.
1 1/2" = 1'-0"



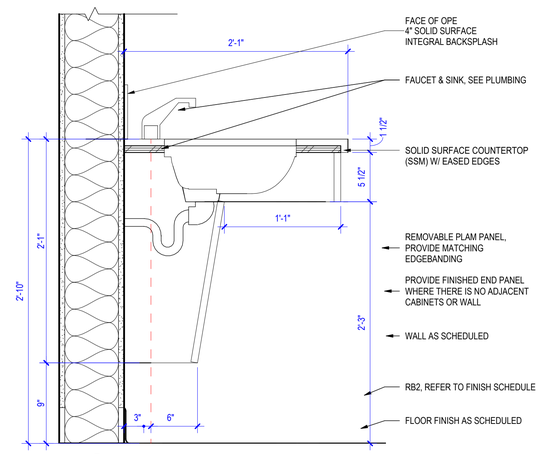
10 PULL OUT TRASH CABINET, TYP.
1 1/2" = 1'-0"



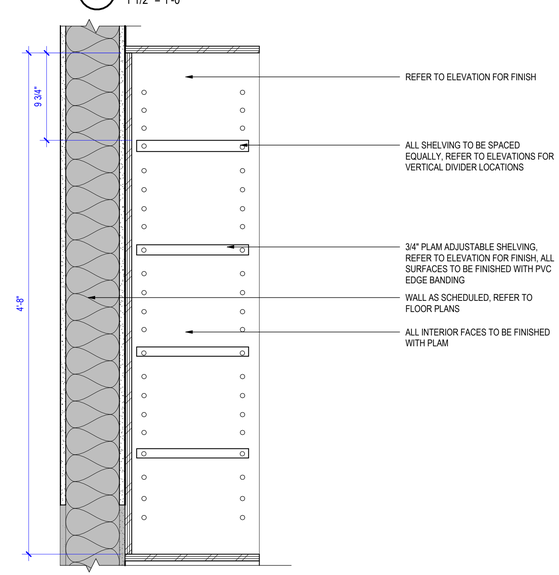
9 LOCKER BASE DETAIL
1 1/2" = 1'-0"



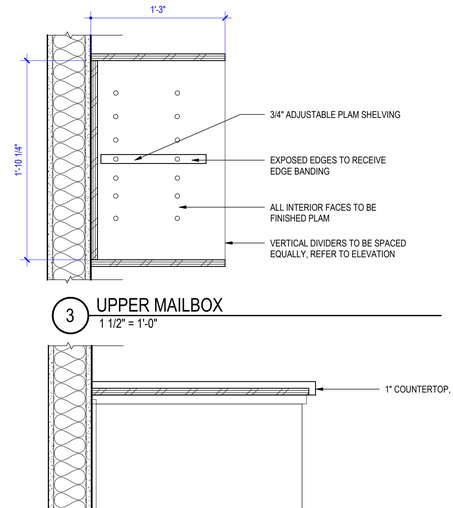
6 SINK CABINET DETAIL, TYP.
1 1/2" = 1'-0"



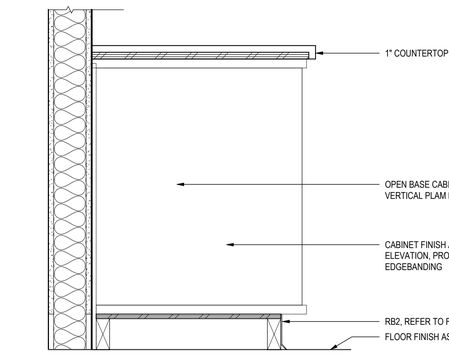
5 APRON SINK DETAIL, TYP.
1 1/2" = 1'-0"



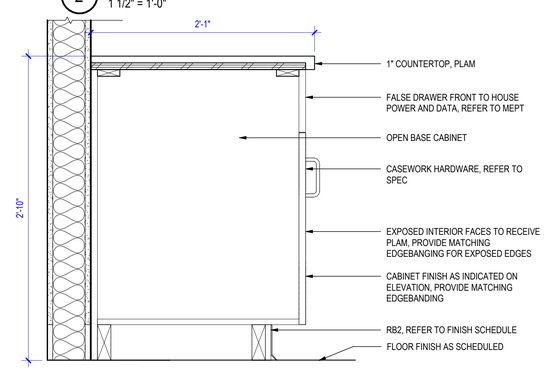
4 TYPICAL MAILBOX
1 1/2" = 1'-0"



3 UPPER MAILBOX
1 1/2" = 1'-0"



2 MAILROOM OPEN BASE CABINET WITH DIVIDERS
1 1/2" = 1'-0"



1 MAIL ROOM FALSE FRONT BASE CABINET
1 1/2" = 1'-0"

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NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
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SHEET NAME:
CASEWORK SECTION AND DETAILS

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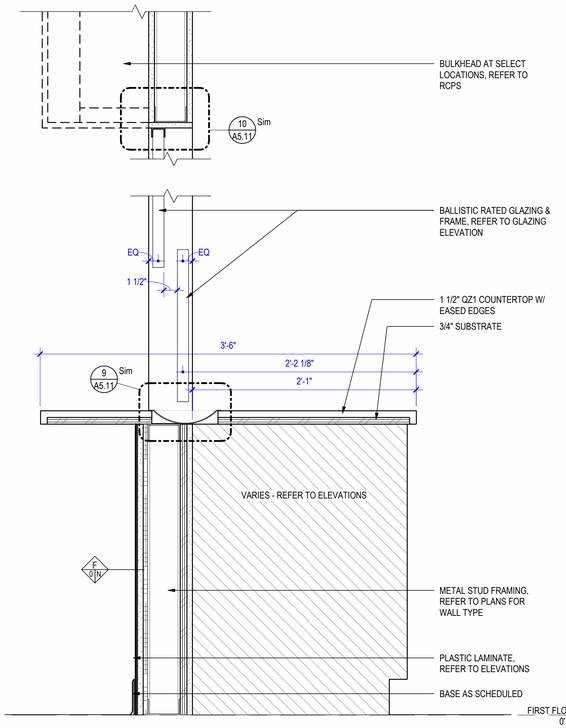
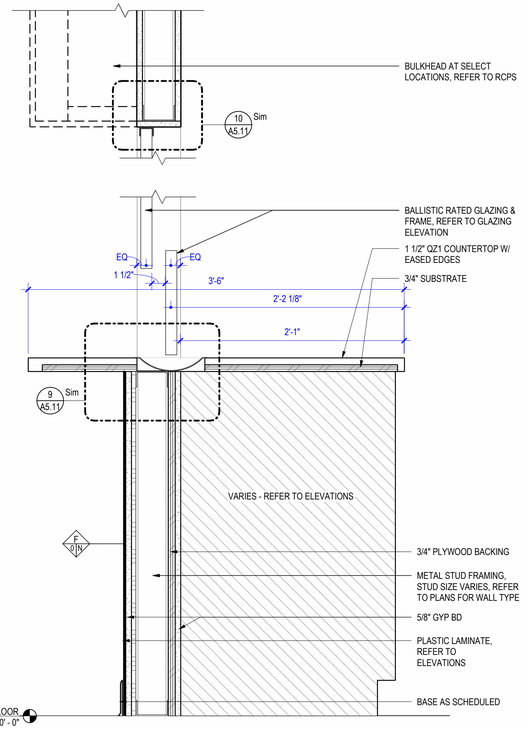
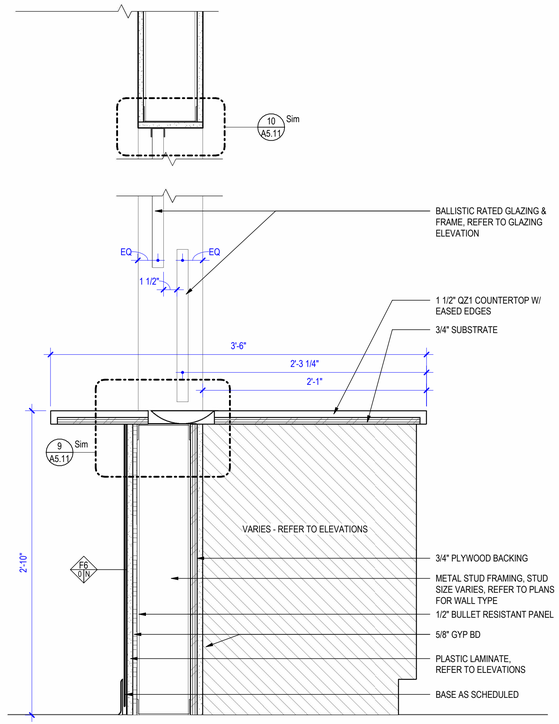


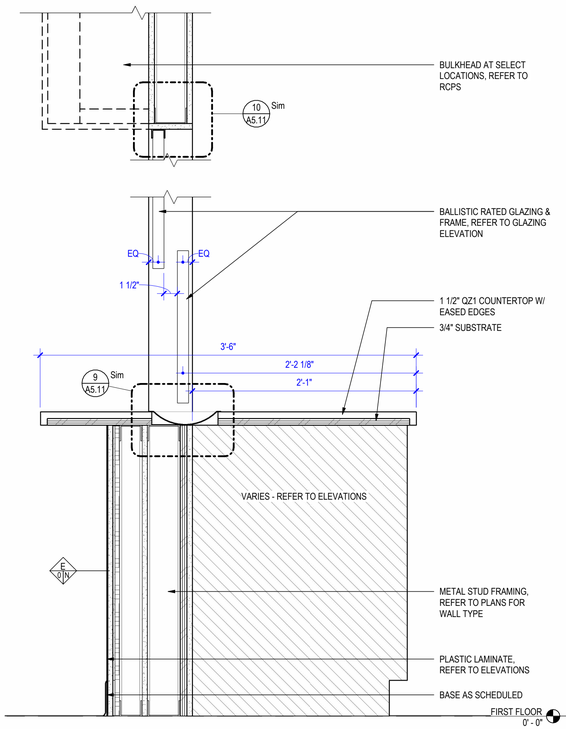
7 WALL SECTION - ADA TRANSACTION TYP - ALTERNATE 2
1 1/2" = 1'-0"



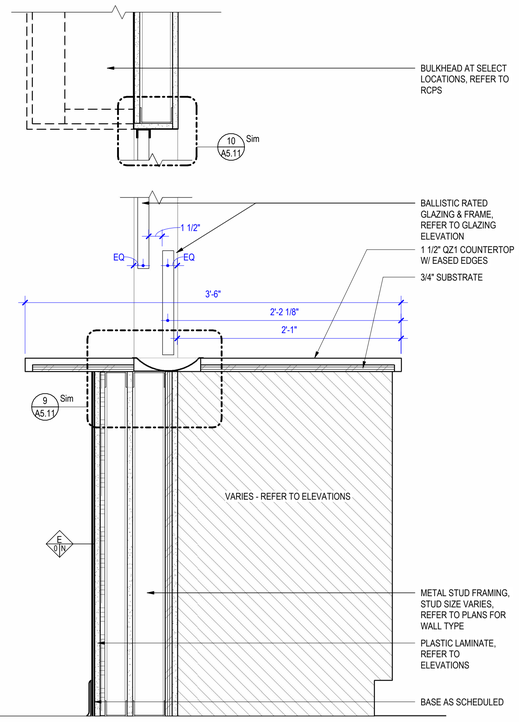
6 WALL SECTION - TRANSACTION - ALTERNATE 2 - TYP
1 1/2" = 1'-0"



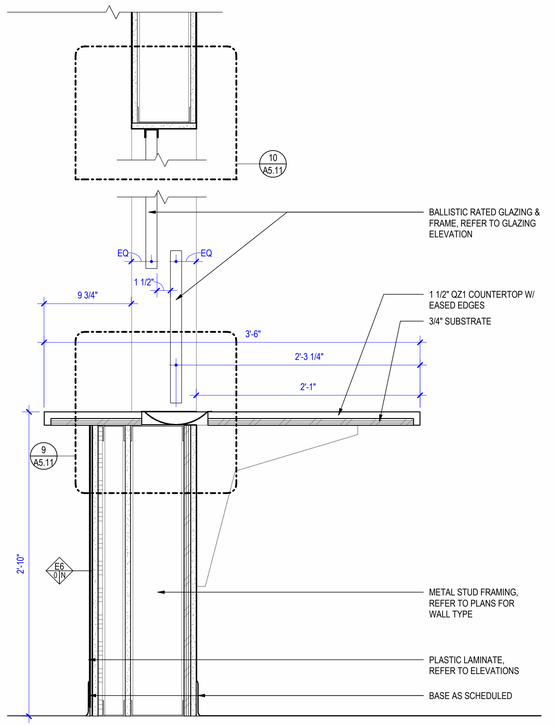
5 WALL SECTION - TRANSACTION AT 1200 - ALTERNATE 2
1 1/2" = 1'-0"



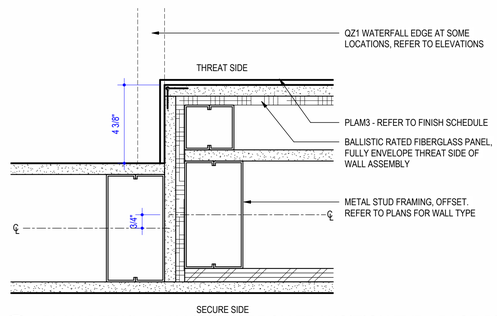
3 WALL SECTION - ADA TRANSACTION TYP
1 1/2" = 1'-0"



2 WALL SECTION - TRANSACTION - BASE BID - TYP
1 1/2" = 1'-0"



1 WALL SECTION - TRANSACTION AT 1200
1 1/2" = 1'-0"



4 PLAN DETAIL - BALLISTIC APRON TRANSITION TYP - BASE BID
3" = 1'-0"

GENERAL MILLWORK NOTES:

CASEWORK TAG

CUSTOM
PLAM1 - V•L
24 • 24 • 34.5

CUSTOM SIZE
MATERIAL
LOCK INDICATOR
LIGHT VALANCE
SIZE: W•D•H

COUNTERTOP TAG

PLAM1
4 • 25 • 1.50

MATERIAL
COUNTERTOP THICKNESS
COUNTERTOP SIZE: D
BACKSPLASH SIZE: H

1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION OF NEW CONSTRUCTION. NOTIFY ARCHITECT OF FIELD DISCREPANCIES.
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9. HEIGHT BETWEEN UPPER CABINET & COUNTER TO BE 18", U.N.O.
10. ALL EXPOSED EDGES OF ADJUSTABLE SHELVING IN OPEN CABINETS TO RECEIVE PLAM.

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Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

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BID DOCUMENTS

SHEET NAME:
TRANSACTION COUNTER SECTIONS

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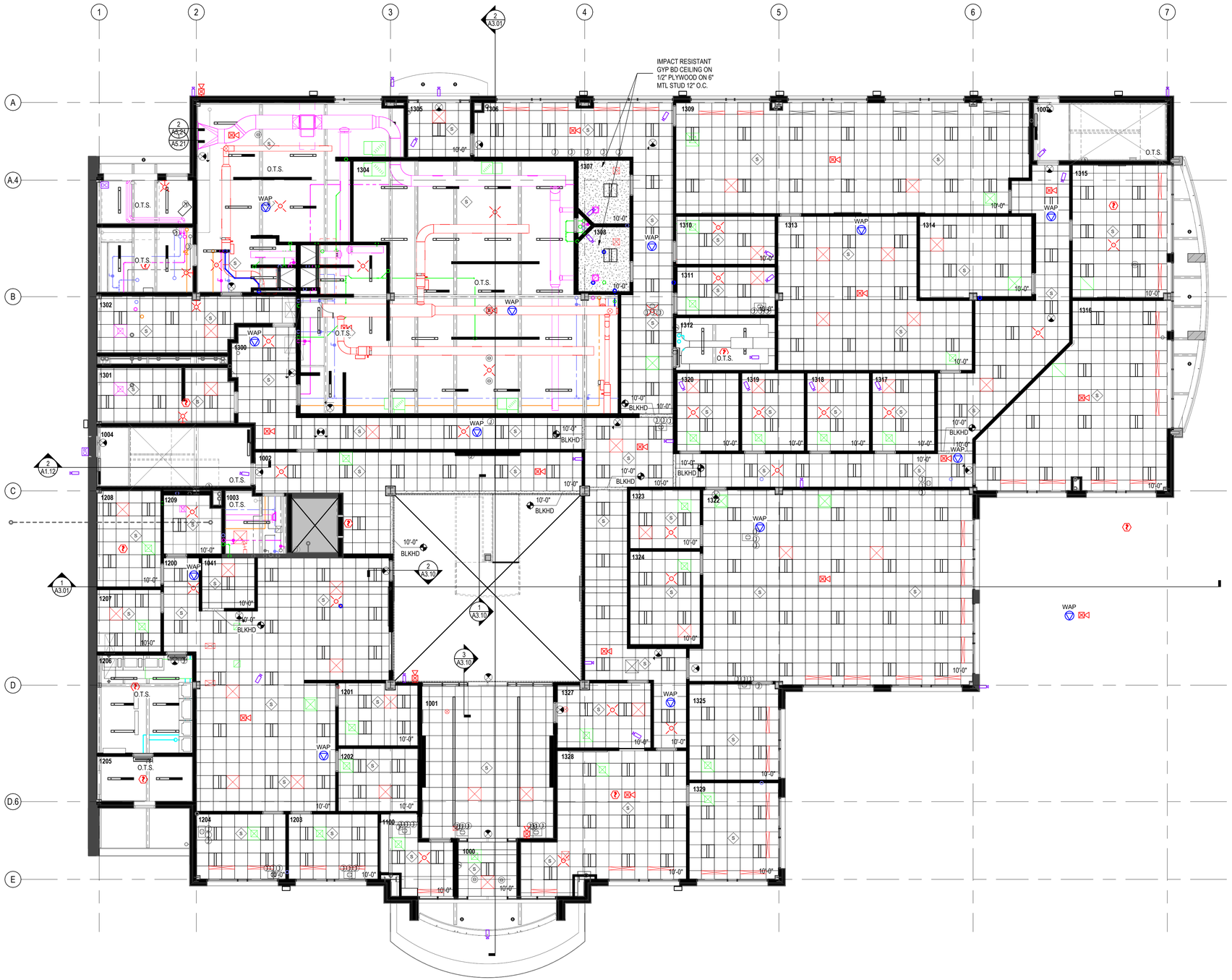

1 1ST FLOOR REFLECTED CEILING PLAN
1/8" = 1'-0"

NORTH

CEILING LEGEND:

MEPT SYMBOLS SHOWN FOR REFERENCE ONLY, REFER TO MEPT DRAWINGS

- RECESSED ROUND CAN LIGHT
- RECESSED SQUARE CAN LIGHT
- 2x2 RECESSED DIRECT LIGHT
- 2X4 RECESSED DIRECT LIGHT
- 2x2 RECESSED INDIRECT LIGHT
- 2x4 RECESSED INDIRECT LIGHT
- LINEAR LIGHT
- ROUND DECORATIVE PENDENT LIGHT
- EXHAUST
- DIFFUSER
- RETURN
- SPRINKLER HEAD
- EXIT SIGN
- CD CARBON DIOXIDE DETECTOR
- S SPEAKER
- SD SMOKE DETECTOR
- FS FIRE STROBE
- S OCCUPANCY SENSOR
- 2X4 ACOUSTICAL CEILING TILE
- 2X2 ACOUSTICAL CEILING TILE
- GYPSUM BOARD CEILING
- FULL HEIGHT WALL
- PARTIAL HEIGHT WALL

GENERAL CEILING NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. CEILING HEIGHTS ARE SHOWN ON THE REFLECTED CEILING PLAN.
3. REFER TO ELECTRICAL DRAWINGS AND FIRE PROTECTION DRAWING FOR FIXTURE AND EQUIPMENT TYPE.
4. REFER TO MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.
5. ALIGN CEILING GRID IN ROOMS WITH ACOUSTIC CEILING TILE CEILING SYSTEM AS SHOWN ON CEILING PLAN.
6. PLACE ALL CEILING MOUNTED EQUIPMENT IN THE CENTER OF THE CEILING TILE UNLESS OTHERWISE NOTED. COORDINATE ALL DISCREPANCIES WITH ARCHITECT PRIOR TO INSTALLATION.
7. REFER TO FLOOR PLANS FOR WALL TYPES AND WALL LOCATIONS .
8. SEE INTERIOR ELEVATIONS / SECTIONS / DETAILS FOR ADDITIONAL INFORMATION ON FINISHED SOFFIT, BULKHEAD, CEILING, ETC. WHERE NOT INDICATED ON REFLECTED CEILING PLAN.
9. EXPOSED STRUCTURE AND DUCTWORK TO BE PAINTED PT3 FOR AREAS NOTED AS O.T.S.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: FIRST FLOOR REFLECTED CEILING PLAN

SHEET: A6.11

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NORTH

1 2ND FLOOR REFLECTED CEILING PLAN
1/8" = 1'-0"

CEILING LEGEND:

MEPT SYMBOLS SHOWN FOR REFERENCE ONLY, REFER TO MEPT DRAWINGS

- RECESSED ROUND CAN LIGHT
- RECESSED SQUARE CAN LIGHT
- 2x2 RECESSED DIRECT LIGHT
- 2X4 RECESSED DIRECT LIGHT
- 2x2 RECESSED INDIRECT LIGHT
- 2x4 RECESSED INDIRECT LIGHT
- LINEAR LIGHT
- ROUND DECORATIVE PENDENT LIGHT
- EXHAUST
- DIFFUSER
- RETURN
- SPRINKLER HEAD
- EXIT SIGN
- CD CARBON DIOXIDE DETECTOR
- S SPEAKER
- SD SMOKE DETECTOR
- FS FIRE STROBE
- OCCUPANCY SENSOR
- 2X4 ACOUSTICAL CEILING TILE
- 2X2 ACOUSTICAL CEILING TILE
- GYPSUM BOARD CEILING
- FULL HEIGHT WALL
- PARTIAL HEIGHT WALL

GENERAL CEILING NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. CEILING HEIGHTS ARE SHOWN ON THE REFLECTED CEILING PLAN.
3. REFER TO ELECTRICAL DRAWINGS AND FIRE PROTECTION DRAWING FOR FIXTURE AND EQUIPMENT TYPE.
4. REFER TO MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.
5. ALIGN CEILING GRID IN ROOMS WITH ACOUSTIC CEILING TILE CEILING SYSTEM AS SHOWN ON CEILING PLAN.
6. PLACE ALL CEILING MOUNTED EQUIPMENT IN THE CENTER OF THE CEILING TILE UNLESS OTHERWISE NOTED. COORDINATE ALL DISCREPANCIES WITH ARCHITECT PRIOR TO INSTALLATION.
7. REFER TO FLOOR PLANS FOR WALL TYPES AND WALL LOCATIONS .
8. SEE INTERIOR ELEVATIONS / SECTIONS / DETAILS FOR ADDITIONAL INFORMATION ON FINISHED SOFFIT, BULKHEAD, CEILING, ETC. WHERE NOT INDICATED ON REFLECTED CEILING PLAN.
9. EXPOSED STRUCTURE AND DUCTWORK TO BE PAINTED PT3 FOR AREAS NOTED AS O.T.S.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE NAME

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NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
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SHEET NAME:
SECOND FLOOR REFLECTED CEILING PLAN

SHEET:
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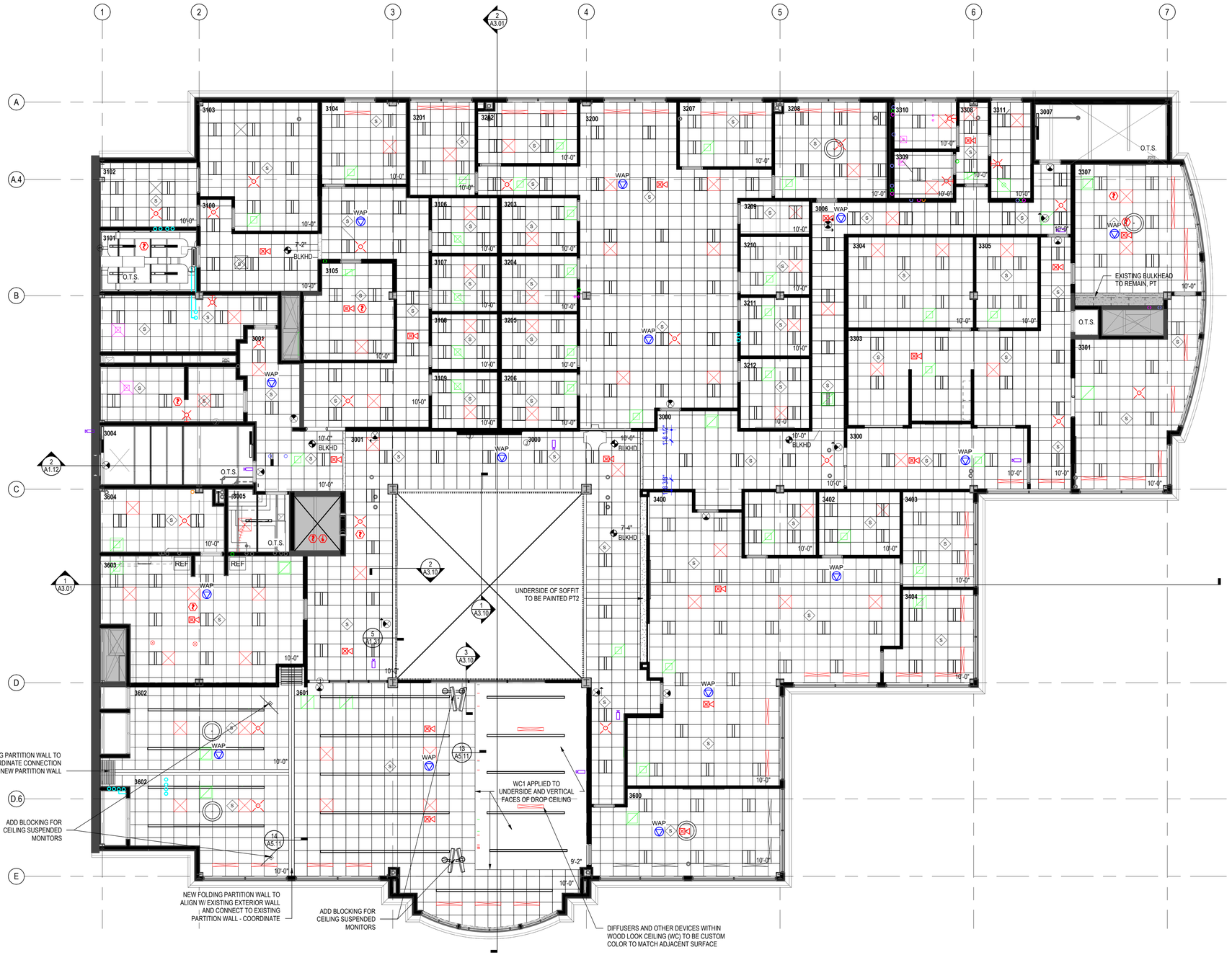

NORTH

1 3RD FLOOR REFLECTED CEILING PLAN
1/8" = 1'-0"

CEILING LEGEND:

MEPT SYMBOLS SHOWN FOR REFERENCE ONLY, REFER TO MEPT DRAWINGS

- RECESSED ROUND CAN LIGHT
- RECESSED SQUARE CAN LIGHT
- 2x2 RECESSED DIRECT LIGHT
- 2X4 RECESSED DIRECT LIGHT
- 2x2 RECESSED INDIRECT LIGHT
- 2x4 RECESSED INDIRECT LIGHT
- LINEAR LIGHT
- ROUND DECORATIVE PENDENT LIGHT
- EXHAUST
- DIFFUSER
- RETURN
- SPRINKLER HEAD
- EXIT SIGN
- CD CARBON DIOXIDE DETECTOR
- S SPEAKER
- SD SMOKE DETECTOR
- FS FIRE STROBE
- OCCUPANCY SENSOR
- 2X4 ACOUSTICAL CEILING TILE
- 2X2 ACOUSTICAL CEILING TILE
- GYPSUM BOARD CEILING
- FULL HEIGHT WALL
- PARTIAL HEIGHT WALL

GENERAL CEILING NOTES:

1. HATCHED AREAS ARE SHOWN FOR REFERENCE ONLY AND ARE GENERALLY OUTSIDE OF PROJECT SCOPE.
2. CEILING HEIGHTS ARE SHOWN ON THE REFLECTED CEILING PLAN.
3. REFER TO ELECTRICAL DRAWINGS AND FIRE PROTECTION DRAWING FOR FIXTURE AND EQUIPMENT TYPE.
4. REFER TO MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION.
5. ALIGN CEILING GRID IN ROOMS WITH ACOUSTIC CEILING TILE CEILING SYSTEM AS SHOWN ON CEILING PLAN.
6. PLACE ALL CEILING MOUNTED EQUIPMENT IN THE CENTER OF THE CEILING TILE UNLESS OTHERWISE NOTED. COORDINATE ALL DISCREPANCIES WITH ARCHITECT PRIOR TO INSTALLATION.
7. REFER TO FLOOR PLANS FOR WALL TYPES AND WALL LOCATIONS .
8. SEE INTERIOR ELEVATIONS / SECTIONS / DETAILS FOR ADDITIONAL INFORMATION ON FINISHED SOFFIT, BULKHEAD, CEILING, ETC. WHERE NOT INDICATED ON REFLECTED CEILING PLAN.
9. EXPOSED STRUCTURE AND DUCTWORK TO BE PAINTED PT3 FOR AREAS NOTED AS O.T.S.

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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR REFLECTED CEILING PLAN

SHEET:
A6.13

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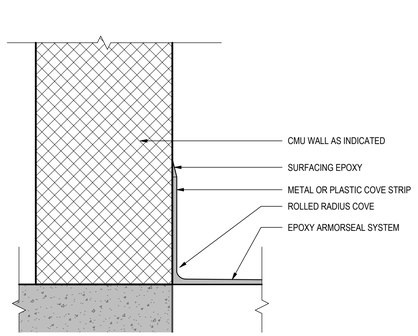
INTERIOR MATERIAL LEGEND

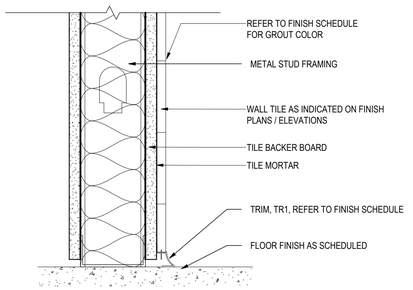
MATERIAL LABEL	MATERIAL DESCRIPTION
ACR	ACRYLIC MATERIAL
ACT	ACOUSTICAL CEILING TILE AND GRID
AMC	ACOUSTIC METAL CEILING
AP	ACOUSTIC PANEL
CC	SHOWER CURTAIN
CG	CORNER GUARD
CONC	CONCRETE
CPT	CARPET
EF	EPOXY FLOORING
EPT	EPOXY PAINT
EX	EXISTING
FAB	FABRIC
GF	GRAPHIC FILM
GR	GROUT
GYP	GYPSUM WALL BOARD
IB1	EPOXY INTEGRAL BASE
LKR	LOCKER
MKBD	MARKERBOARD
MP	METAL PANEL
PLAM	PLASTIC LAMINATE
PT	PAINT
QZ	QUARTZ
RB	RESILIENT BASE
RF	RESILIENT FLOORING
SSM	SOLID SURFACE MATERIAL
SST	STAINLESS STEEL
STO	STONE
STR	STAIR TREAD
TK	TACKABLE SURFACE
TL	TILE
TP	TOILET PARTITION
TZ	TERAZZO
VWG	VINYL WALL GRAPHIC
WB	WOOD BASE
WC	WALLCOVERING
WD	WOOD
WOC	WALK OFF CARPET
WP	WALL PROTECTION
WT	WINDOW TREATMENT

INTERIOR FINISH LEGEND

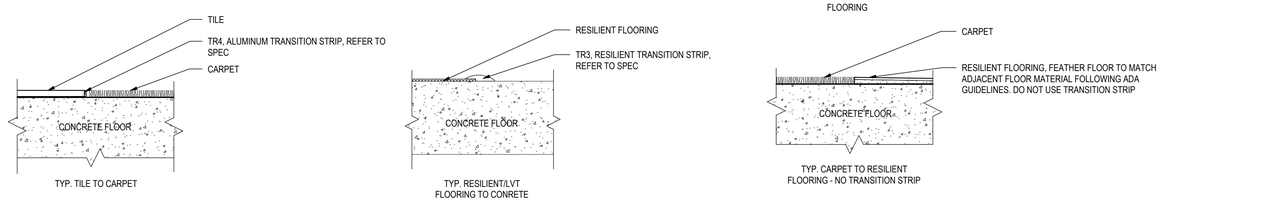
TAG	MANUFACTURER	STYLE	COLOR	SIZE	COMMENTS
BASE					
IB1	-	-	-	6" HIGH	INTEGRAL BASE TO MATCH EPOXY FLOORING. REFER TO FINISH PLANS FOR LOCATIONS
RB1	JOHNSONITE	TRADITIONAL COVE BASE AT HARD SURFACE; STRAIGHT AT CARPET	VN2 STONE COTTAGE	4" HIGH	-
RB2	JOHNSONITE	MILLWORK PROFILE, MONUMENT	VN2 STONE COTTAGE	4" HIGH	-
TB1	CROSSVILLE	SHADES 2.0 BULLNOSE MATTE RECTIFIED	HAZE, UNPOLISHED	4" HIGH	-
WB1	-	PLAIN SLICED WHITE MAPLE	CUSTOM TO MATCH WC1	4" HIGH	COUNCIL CHAMBER LOCATIONS WHERE WC1 IS APPLIED
CEILING					
ACT1	ARMSTRONG CEILINGS	ULTIMA 1911; BEVELED TEGULAR, 15/16" GRID	TILES: WHITE; GRID/TRIM: WHITE	24" X 24"	-
FLOOR					
CONC1	-	POLISHED CONCRETE	-	-	-
CONC2	-	SEALED CONCRETE	-	-	-
CPT1	PATCRAFT	PATINA I0511	INDUSTRIAL CRAFT 00540	12" X 48"	ASHLAR INSTALLATION, COUNCIL CHAMBERS, CONFERENCE ROOMS, MAYOR'S SUITE, POLICE DEPARTMENT - REFER TO FINISH PLANS
CPT2	PATCRAFT	REACT I0514	INDUSTRIAL CRAFT 00540	12" X 48"	ASHLAR INSTALLATION, OFFICES
CPT3	J+J FLOORING	KINETEX	STRATA 1826 - 1851 GEOLOGIC	18" X 36"	ASHLAR INSTALLATION, POLICE DEPARTMENT AREAS - REFER TO FINISH PLAN FOR LOCATION
CPT4	SHAW CONTRACT	STATICSMART	COASTAL BREEZE	24" X 24"	ASHLAR INSTALLATION, CONTROL ROOM AND IT CORRIDOR
EF1	SHERWIN WILLIAMS	EPOXY ARMORSEAL 8100	WHITE, SATIN	-	HOLDING CELLS
LVT1	PATCRAFT	TREELINE I721V	CAMEL 00713	7" X 48" X 5MM THICKNESS	BRICK INSTALLATION, ATRIUM AND PUBLIC HALLWAYS
RF1	PATCRAFT	NUMIX 1768V	SEPIA FLECK 00760	36" X 36"	MONOLITHIC INSTALLATION, STAIRS, EMPLOYEE BREAK ROOMS, AND CORRIDORS AS INDICATED ON FINISH PLANS
RF2	JOHNSONITE	SQUARE VINYL STAIR NOSING	47 BROWN	-	ATRIUM STAIRWELL NOSING
RF3	PATCRAFT	STANDARD STAIR TREAD	COBBLESTONE 00750	4" W	EGRESS STAIR TOWERS
TL1	CROSSVILLE	SHADES 2.0	HAZE, UNPOLISHED	12" X 24" FIELD TILE	STACK BOND INSTALLATION, NEW RESTROOMS & POLICE LOCKER ROOMS
WOC1	BENTLEY	ROUGH IDEA SHEAR	OUTLINE 800115	24" X 24"	BRICK INSTALLATION, WALK OFF CARPET - VESTIBULES & LOBBY
MILLWORK					
PLAM1	WILSONART	STANDARD LAMINATE	MANITOBA MAPLE 7911-60	-	VERTICAL CASEWORK, INTENDED TO MATCH WD1
PLAM2	WILSONART	STANDARD LAMINATE	WALLABY D439-60	-	COUNTERTOP
PLAM3	WILSONART	STANDARD LAMINATE	CRYSTAL D388-60	-	VERTICAL APPLICATION BELOW TRANSACTION COUNTER
QZ1	WILSONART	QUARTZ	NIWA Q1002	-	DEPARTMENT RECEPTION COUNTERS
SSM1	LIVINGSTONE	SOLID SURFACE	L721 AVALANCHE	-	COUNTERTOPS WITH SINKS, NEW WINDOW SILLS
MISC					
CC1	INPRO	SUPER BIO STAT VINYL PRIVACY CURTAIN	SHARKSKIN 100253	72.5" W	POLICE DEPARTMENT SHOWER STALLS
GR1	MAPEI	FLEXCOLOR CQ	IRON 5107	-	TO BE USED WITH TL1
GR2	MAPEI	FLEXCOLOR CQ	SAHARA BEIGE 5011	-	TO BE USED WITH TL2
LKR1	LYON	MATCH EXISTING	MATCH EXISTING	18"W X 24"D	POLICE DEPARTMENT LOCKER ROOMS
SSM2	INPRO	PRISM SOLID SURFACE SHOWER WALLS	TAUPE P9005	36" W, 96" H	PANELS FOR POLICE DEPARTMENT SHOWERS
TR1	SCHLUTER SYSTEMS	JOLLY	SATON ANODIZED ALUMINUM	-	ALL OUTSIDE CORNERS AND EXPOSED EDGES OF TILE
TR2	SCHLUTER SYSTEMS			-	CARPET TO CONCRETE TRANSITION
TR3	JOHNSONITE			-	CONCRETE TO TILE TRANSITION - RESILIENT
TR4	SCHLUTER SYSTEMS			-	CARPET TO TILE TRANSITION
WD1	EGGERS INDUSTRIES	PLAIN SLICED WHITE MAPLE	01 CLEAR	-	WOOD DOORS AND ATRIUM BENCH FINISH
WF1	3M	PRIVACY FILM - FROSTED, OPACITY TBD		-	APPLIED TO EXISTING GLAZING COMPLETE
WT1	MECHOSHADES	MANUAL 5X SYSTEM - SHEER FABRIC 1%	THERMOVEIL 1700 SERIES - 1724 TAUPE	-	REFER TO FINISH PLAN FOR LOCATIONS. FIELD VERIFY ALL EXISTING CONDITIONS FOR INSTALLATION METHOD PRIOR TO ORDER ENTRY. INCLUDE FASCIA ACCESSORY
WALL					
CG1	INPRO	SURFACE MOUNT CORNER GUARD	STAINLESS STEEL	2"W LEG X 6'-10" H	INSTALL ABOVE BASE. REFER TO FINISH PLANS FOR LOCATIONS. TO BE APPLIED TO ALL GYP CORNERS. TOP OF CORNER GUARD TO BE AT 7'-2".
CG2	INPRO	SURFACE MOUNT CORNER GUARD - END WALL PROTECTION	STAINLESS STEEL	END WALL THICKNESS X 6'-10" H	INSTALL ABOVE BASE. REFER TO FINISH PLANS FOR LOCATIONS. TO BE APPLIED TO ALL GYP CORNERS. TOP OF CORNER GUARD TO BE AT 7'-2".
CG3	INPRO	SURFACE MOUNT CORNER GUARD	STAINLESS STEEL WRAPPED IN WC1	1" W LEG X FULL HEIGHT	TO BE APPLIED TO CORNERS OF WC1 LOCATIONS. CORNER GUARD TO BE INSTALLED AND WRAPPED AFTER WALL SURFACE RECEIVES WC1. COORDINATE ONSITE VISIT WITH DESIGNER PRIOR TO INSTALL.
FRP	-	FIBER REINFORCED PANELS	-	-	JANITOR CLOSET LOCATIONS
MKBD1	DEKO BEZEL MARKERBOARDS	FRAMELESS	DIAMOND WHITE	8'W X 4'H	REFER TO FINISH PLANS FOR LOCATIONS
PLAM4	WILSONART	PREMIUM LAMINATE	VAPOR STRANDZ 4939K-18	-	ELEVATOR WALLS, EXISTING PANELS TO BE REFINISHED
PT1/EPT1	SHERWIN WILLIAMS	-	CRUSHED ICE 7647	-	NEUTRAL FIELD PAINT
PT2	SHERWIN WILLIAMS	-	ANONYMOUS 7046	-	STAIRWELL, HOLLOW METAL DOORS & FRAMES, BULKHEADS ABOVE TRANSACTION COUNTERS.
PT3	SHERWIN WILLIAMS	-	CEILING BRIGHT WHITE 7007	-	OPEN TO STRUCTURE COLOR
PT4	SHERWIN WILLIAMS	-	GECKO 6719	-	ACCENT PAINT, SIGNAGE
PT5	SHERWIN WILLIAMS	-	INTENSE TEAL 6943	-	ACCENT PAINT, SIGNAGE
PT6	SHERWIN WILLIAMS	-	HONORABLE BLUE 6811	-	ACCENT PAINT, SIGNAGE
PT7	SHERWIN WILLIAMS	-	TRICORN BLACK 6258	-	EXISTING LOUVERS ON RAILING WALLS
PT8/EPT8	SHERWIN WILLIAMS	-	WALL STREET	-	ACCENT PAINT IN POLICE DEPARTMENT
TK1	ACOUFELT	SOLID WALL PANEL	PEARL	6' W X 3'-6" H U.N.O., REFER TO ELEVATION	TACKABLE SURFACE FOR DEPARTMENTS, CUSTOM TACKABLE SURFACE FOR BEHIND COUNCIL CHAMBER DIAS
TL2	CROSSVILLE	SHADES 2.0	CLAY	12" X 24"	STACK BOND INSTALLATION, RESTROOM AND DRINKING FOUNTAIN WALL TILE, FULL HEIGHT
VWG1	3M	CONTROLTAC VINYL WALL GRAPHIC	-	REFER TO ELEVATION	CUSTOM DESIGN TO BE PROVIDED AT A LATER DATE, LEVEL 5 FINISH REQUIRED AT ALL VWG1 LOCATIONS.
WC1	3M - DESIGNTEX	DI-NOC WOOD GRAIN DESIGN PATTERN	FINE WOOD FW-1214	-	WAYFINDING PANELS BEHIND STAIRS AND COUNCIL CHAMBER FEATURE WALL, REFER TO ELEVATIONS, LEVEL 5 FINISH REQUIRED AT ALL VWG1 LOCATIONS.
WD2	ARMSTRONG CEILINGS	WOODWORKS ACGI GRILLE BACKER SERIES 1 (PRODUCT CODE: GB1-X225-C)	PLAIN SLICED WHITE MAPLE NWM	TBD	APPLIED ON PERIMETER OF ATRIUM RAILING ON EACH FLOOR, SEE ELEVATIONS. BLACK FELT LAYER INSTALLED BETWEEN WOOD BLADES AND WOOD



3 TYPICAL INTEGRAL EPOXY FLOOR BASE
3" = 1'-0"



2 TYPICAL WALL TILE TO FLOOR TRANSITION DETAIL
3" = 1'-0"

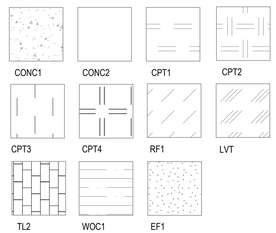


1 FLOORING TRANSITION DETAILS
3" = 1'-0"

GENERAL FINISH NOTES:

1. ⟷ INDICATES FLOORING DIRECTION
2. ALL EXPOSED CONCRETE SHALL BE KEPT CLEAN AND FREE OF DEBRIS THROUGHOUT CONSTRUCTION PROCESS. INTERIOR CONCRETE TO BE SMOOTH FINISH UNLESS OTHERWISE NOTED.
3. CAULKS OR SEALANTS TO MATCH ADJACENT MATERIAL COLOR, REVEAL COLORS OR GROUT COLORS.
4. FLOORING MATERIAL CHANGES SHALL OCCUR AT CENTERLINE OF DOOR LEAF FOR SWINGING DOOR LOCATIONS, UNLESS OTHERWISE NOTED.
5. FLOORING MATERIAL CHANGES SHALL OCCUR AND ALIGN WITH EDGE OF WALL ON DOOR SIDE FOR SLIDING DOOR LOCATIONS, UNLESS OTHERWISE NOTED.
6. FLOORING MATERIAL AND PATTERN TO CONTINUE UNDER ALL OPEN MILLWORK AND WORKSURFACES, EXTENDING TO WALL OR BASE CABINET.
7. REFER TO FLOORING TRANSITION DETAILS FOR LOCATIONS TO RECEIVE TRANSITIONS. NOT ALL LOCATIONS WHERE FLOOR TYPES DIFFER SHALL RECEIVE TRANSITIONS. IF DISCREPANCY ARISES, CONSULT DESIGNER.
8. FLOORING TRANSITIONS MAY BE DESIGNATED BY TEXT AND/OR HATCH PATTERNS. IF DISCREPANCY ARISES, CONSULT DESIGNER.
9. UNDERCOUNTER SUPPORT BRACKETS TO BE PAINTED TO MATCH ADJACENT WALL SURFACE, UNLESS OTHERWISE NOTED.
10. ALL GYP BD, CEILINGS AND WALLS TO BE PAINTED, UNLESS OTHERWISE NOTED. SEE REFLECTED CEILING PLANS AND ELEVATIONS FOR ACCENT PAINT LOCATIONS.
11. EXPOSED CEILING STRUCTURE, INCLUDING, BUT NOT LIMITED TO PIPING, DUCTWORK, BEAMS, TRUSSES, SUPPORTS, DECKING AND SIMILAR TO BE PAINTED, UNLESS OTHERWISE NOTED.
12. GRILLES, LOUVERS, VENTS, ELECTRICAL CABINETS, AND SIMILAR TO BE PAINTED TO MATCH ADJACENT SURFACE, UNLESS OTHERWISE NOTED.
13. UNDERSIDE OF STAIR ASSEMBLIES, RAILING, STRINGERS, STAIR COLUMN, HANDRAILS, AND EXISTING METAL COMPOSITE PANEL TO BE PAINTED PT2, UNLESS OTHERWISE NOTED.
14. EXISTING GYPSUM COLUMNS TO BE PAINTED PT1, U.N.O.
15. ACCENT PAINT COLORS TO BE PAINTED CORNER TO CORNER OF NOTED WALL IN PLAN, UNLESS OTHERWISE NOTED.
16. PAINTED WALLS IN RESTROOMS AND JANITOR TO BE EPOXY PAINT, UNLESS OTHERWISE NOTED.
17. WALL TILE TO BE FULL HEIGHT IN AREAS AS SHOWN. CUT TILES TO BE AT TOP OF WALL, UNLESS OTHERWISE NOTED. ALL EXPOSED EDGES, INCLUDING TOP OF TILE BASE, TO BE FINISHED WITH METAL TRIM, UNLESS OTHERWISE NOTED.
18. IN AREAS THAT HAVE BOTH WALL TILE AND FLOOR TILE, GROUT JOINTS SHALL ALIGN ON FLOORS AND WALLS, UNLESS OTHERWISE NOTED. COORDINATE LAYOUT WITH DESIGNER PRIOR TO INSTALL.
19. IN AREAS WHERE WALL TILE IS PARTIAL HEIGHT, TOP OF EXPOSED TILE TO BE FINISHED WITH METAL TRIM, UNLESS OTHERWISED NOTED.
20. ALL EXPOSED AND/OR CUT EDGES OF CEILING TILE TO RECEIVE PAINT. PAINT TO MATCH CEILING TILE COLOR.
21. NO BASE TO BE APPLIED TO BRICK, CMU, PRECAST, STONE OR TILE WALL LOCATIONS, UNLESS OTHERWISE NOTED. IF DISCREPANCY ARISES, CONSULT DESIGNER.
22. ALL MOP SINK LOCATIONS TO RECEIVE FRP PANELS ON ADJACENT WALLS AT MOP SINK, 4'-0" HIGH, UNLESS OTHERWISE NOTED.
23. PROVIDE FINISH MOCKUPS AS INDICATED ON FINISH PLANS, INTERIOR ELEVATIONS, REFLECTED CEILING PLANS AND/OR SPEC. PROVIDE ONSITE VISITS WITH ARCHITECT/DESIGNER FOR REVIEW AS INDICATED.
24. REFERENCE INTERIOR ELEVATIONS FOR CASEWORK & OTHER VERTICAL SURFACE FINISHES.
25. FINISH LEGEND SHALL NOT BE TAKEN AS A COMPLETE SPECIFICATION FOR ALL INTERIOR ROOM MATERIALS. HOWEVER, IT SHALL BE BINDING TO THE EXTENT OF THE MATERIAL IT DOES SPECIFY. THE CONTRACTOR SHALL CHECK THE SCHEDULE WITH SPECIFICATIONS AND DRAWINGS FOR OTHER MATERIALS NOT COVERED BY THE SCHEDULE.
26. FLOORING TO BE INSTALLED TO THE EXTENT UNDER BASE CABINET LOCATIONS TYP.
27. WF1 WINDOW FILM TO BE APPLIED TO INSIDE FACE OF EXISTING GLAZING PANE COMPLETE.

FINISH FLOOR LEGEND:



FINISH BOX KEY



WALL FINISH LEGEND:

- ACCENT PAINT, PT2
- ACCENT PAINT, PT8/EPT8
- ACCENT WALLCOVERING, WC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS
- GRAPHIC WALLCOVERING, GWC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS NOTE: DESIGN WILL BE IMPLEMENTED BY ALLOWANCE
- PLAM4, FOR PANEL REPLACEMENTS IN EXISTING ELEVATOR
- BULLET RESISTANT WALL, AS PART OF ALTERNATE 2
- WALL PROTECTION, WP1
- WINDOW FILM, WF1
- WALL TILE, TL2
- CORNER GUARD

1. COLORS, HEIGHTS AND TYPES MAY VARY. REFERENCE ELEVATIONS, CEILING PLANS, FINISH LEGEND & SPECIFICATIONS FOR MORE INFORMATION.
2. CORNERS OF ALL WOOD WALLS TO HAVE EXTRUDED ALUM CORNER PROTECTION, UNLESS OTHERWISE NOTED. SEE DETAILS.

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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: FINISH SCHEDULE

SHEET: A7.00

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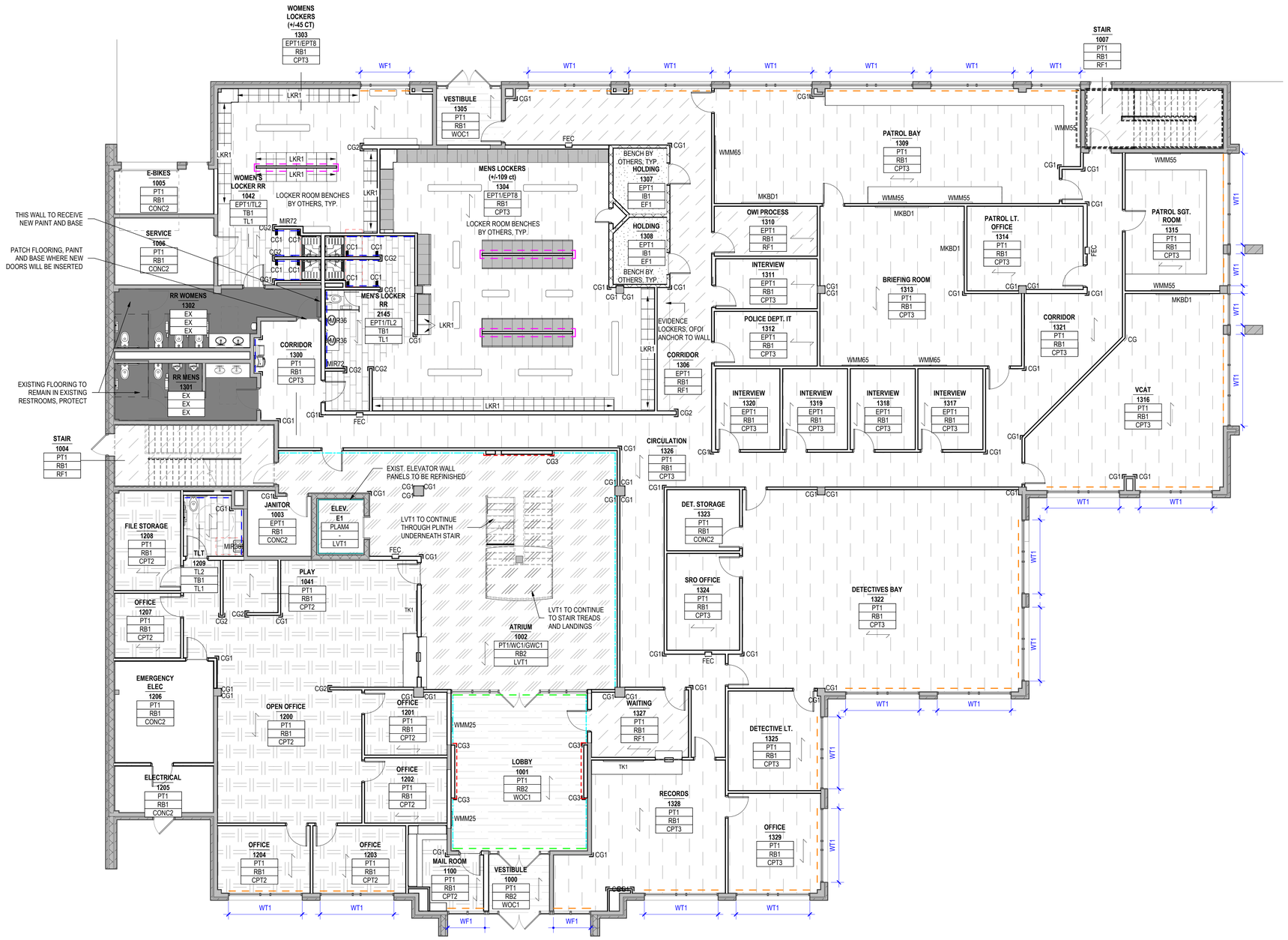


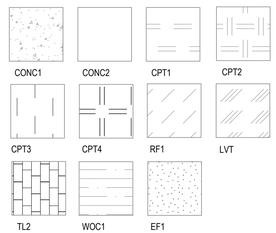
1 FIRST FLOOR FINISH PLAN
1/8" = 1'-0"

NORTH

GENERAL FINISH NOTES:

1. ⟷ INDICATES FLOORING DIRECTION
2. ALL EXPOSED CONCRETE SHALL BE KEPT CLEAN AND FREE OF DEBRIS THROUGHOUT CONSTRUCTION PROCESS. INTERIOR CONCRETE TO BE SMOOTH FINISH UNLESS OTHERWISE NOTED.
3. CAULKS OR SEALANTS TO MATCH ADJACENT MATERIAL COLOR, REVEAL COLORS OR GROUT COLORS.
4. FLOORING MATERIAL CHANGES SHALL OCCUR AT CENTERLINE OF DOOR LEAF FOR SWINGING DOOR LOCATIONS, UNLESS OTHERWISE NOTED.
5. FLOORING MATERIAL CHANGES SHALL OCCUR AND ALIGN WITH EDGE OF WALL ON DOOR SIDE FOR SLIDING DOOR LOCATIONS, UNLESS OTHERWISE NOTED.
6. FLOORING MATERIAL AND PATTERN TO CONTINUE UNDER ALL OPEN MILLWORK AND WORKSURFACES, EXTENDING TO WALL OR BASE CABINET.
7. REFER TO FLOORING TRANSITION DETAILS FOR LOCATIONS TO RECEIVE TRANSITIONS. NOT ALL LOCATIONS WHERE FLOOR TYPES DIFFER SHALL RECEIVE TRANSITIONS. IF DISCREPANCY ARISES, CONSULT DESIGNER.
8. FLOORING TRANSITIONS MAY BE DESIGNATED BY TEXT AND/OR HATCH PATTERNS. IF DISCREPANCY ARISES, CONSULT DESIGNER.
9. UNDERCOUNTER SUPPORT BRACKETS TO BE PAINTED TO MATCH ADJACENT WALL SURFACE, UNLESS OTHERWISE NOTED.
10. ALL GYP BD, CEILINGS AND WALLS TO BE PAINTED, UNLESS OTHERWISE NOTED. SEE REFLECTED CEILING PLANS AND ELEVATIONS FOR ACCENT PAINT LOCATIONS.
11. EXPOSED CEILING STRUCTURE, INCLUDING, BUT NOT LIMITED TO PIPING, DUCTWORK, BEAMS, TRUSSES, SUPPORTS, DECKING AND SIMILAR TO BE PAINTED, UNLESS OTHERWISE NOTED.
12. GRILLES, LOUVERS, VENTS, ELECTRICAL CABINETS, AND SIMILAR TO BE PAINTED TO MATCH ADJACENT SURFACE, UNLESS OTHERWISE NOTED.
13. UNDERSIDE OF STAIR ASSEMBLIES, RAILING, STRINGERS, STAIR COLUMN, HANDRAILS, AND EXISTING METAL COMPOSITE PANEL TO BE PAINTED PT2, UNLESS OTHERWISE NOTED.
14. EXISTING GYPSUM COLUMNS TO BE PAINTED PT1, U.N.O.
15. ACCENT PAINT COLORS TO BE PAINTED CORNER TO CORNER OF NOTED WALL IN PLAN, UNLESS OTHERWISE NOTED.
16. PAINTED WALLS IN RESTROOMS AND JANITOR TO BE EPOXY PAINT, UNLESS OTHERWISE NOTED.
17. WALL TILE TO BE FULL HEIGHT IN AREAS AS SHOWN. CUT TILES TO BE AT TOP OF WALL, UNLESS OTHERWISE NOTED. ALL EXPOSED EDGES, INCLUDING TOP OF TILE BASE, TO BE FINISHED WITH METAL TRIM, UNLESS OTHERWISE NOTED.
18. IN AREAS THAT HAVE BOTH WALL TILE AND FLOOR TILE, GROUT JOINTS SHALL ALIGN ON FLOORS AND WALLS, UNLESS OTHERWISE NOTED. COORDINATE LAYOUT WITH DESIGNER PRIOR TO INSTALL.
19. IN AREAS WHERE WALL TILE IS PARTIAL HEIGHT, TOP OF EXPOSED TILE TO BE FINISHED WITH METAL TRIM, UNLESS OTHERWISED NOTED.
20. ALL EXPOSED AND/OR CUT EDGES OF CEILING TILE TO RECEIVE PAINT. PAINT TO MATCH CEILING TILE COLOR.
21. NO BASE TO BE APPLIED TO BRICK, CMU, PRECAST, STONE OR TILE WALL LOCATIONS, UNLESS OTHERWISE NOTED. IF DISCREPANCY ARISES, CONSULT DESIGNER.
22. ALL MOP SINK LOCATIONS TO RECEIVE FRP PANELS ON ADJACENT WALLS AT MOP SINK, 4'-0" HIGH, UNLESS OTHERWISE NOTED.
23. PROVIDE FINISH MOCKUPS AS INDICATED ON FINISH PLANS, INTERIOR ELEVATIONS, REFLECTED CEILING PLANS AND/OR SPEC. PROVIDE ONSITE VISITS WITH ARCHITECT/DESIGNER FOR REVIEW AS INDICATED.
24. REFERENCE INTERIOR ELEVATIONS FOR CASEWORK & OTHER VERTICAL SURFACE FINISHES.
25. FINISH LEGEND SHALL NOT BE TAKEN AS A COMPLETE SPECIFICATION FOR ALL INTERIOR ROOM MATERIALS. HOWEVER, IT SHALL BE BINDING TO THE EXTENT OF THE MATERIAL IT DOES SPECIFY. THE CONTRACTOR SHALL CHECK THE SCHEDULE WITH SPECIFICATIONS AND DRAWINGS FOR OTHER MATERIALS NOT COVERED BY THE SCHEDULE.
26. FLOORING TO BE INSTALLED TO THE EXTENT UNDER BASE CABINET LOCATIONS TYP.
27. WF1 WINDOW FILM TO BE APPLIED TO INSIDE FACE OF EXISTING GLAZING PANE COMPLETE.

FINISH FLOOR LEGEND:



FINISH BOX KEY

ROOM
RM #
WALLS
BASE
FLOORS
REMARKS

WALL FINISH LEGEND:

- ACCENT PAINT, PT2
- ACCENT PAINT, PT8/EPT8
- ACCENT WALLCOVERING, WC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS
- GRAPHIC WALLCOVERING, GWC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS NOTE: DESIGN WILL BE IMPLEMENTED BY ALLOWANCE
- PLAM4, FOR PANEL REPLACEMENTS IN EXISTING ELEVATOR
- BULLET RESISTANT WALL, AS PART OF ALTERNATE 2
- WALL PROTECTION, WP1
- WINDOW FILM, WF1
- WALL TILE, TL2
- CORNER GUARD

1. COLORS, HEIGHTS AND TYPES MAY VARY. REFERENCE ELEVATIONS, CEILING PLANS, FINISH LEGEND & SPECIFICATIONS FOR MORE INFORMATION.
2. CORNERS OF ALL WOOD WALLS TO HAVE EXTRUDED ALUM CORNER PROTECTION, UNLESS OTHERWISE NOTED. SEE DETAILS.

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Waterloo, IA 50701
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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR FINISH PLAN

SHEET:
A7.11

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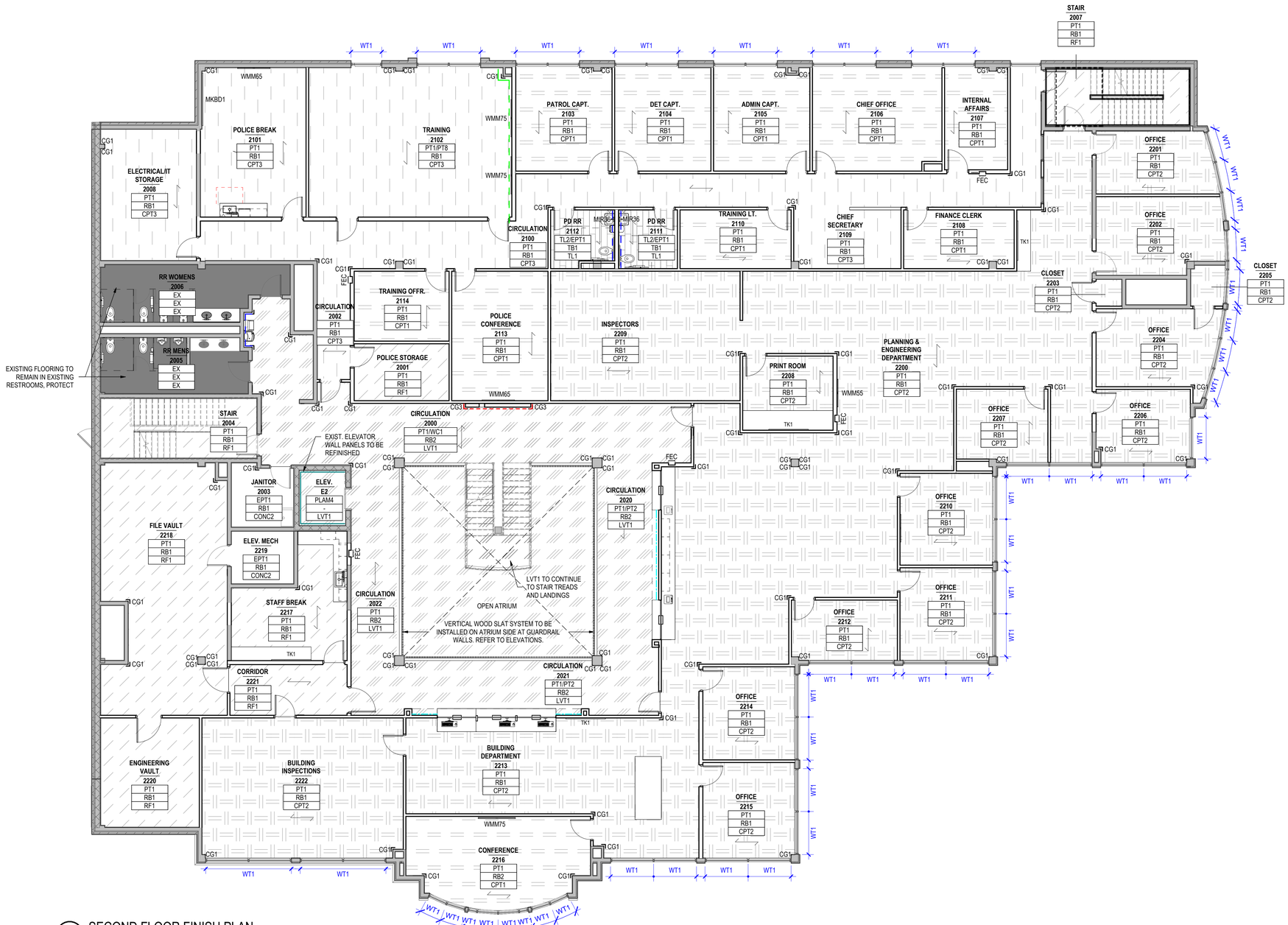

1 SECOND FLOOR FINISH PLAN
1/8" = 1'-0"

GENERAL FINISH NOTES:

1. ⟷ INDICATES FLOORING DIRECTION
2. ALL EXPOSED CONCRETE SHALL BE KEPT CLEAN AND FREE OF DEBRIS THROUGHOUT CONSTRUCTION PROCESS. INTERIOR CONCRETE TO BE SMOOTH FINISH UNLESS OTHERWISE NOTED.
3. CAULKS OR SEALANTS TO MATCH ADJACENT MATERIAL COLOR, REVEAL COLORS OR GROUT COLORS.
4. FLOORING MATERIAL CHANGES SHALL OCCUR AT CENTERLINE OF DOOR LEAF FOR SWINGING DOOR LOCATIONS, UNLESS OTHERWISE NOTED.
5. FLOORING MATERIAL CHANGES SHALL OCCUR AND ALIGN WITH EDGE OF WALL ON DOOR SIDE FOR SLIDING DOOR LOCATIONS, UNLESS OTHERWISE NOTED.
6. FLOORING MATERIAL AND PATTERN TO CONTINUE UNDER ALL OPEN MILLWORK AND WORKSURFACES, EXTENDING TO WALL OR BASE CABINET.
7. REFER TO FLOORING TRANSITION DETAILS FOR LOCATIONS TO RECEIVE TRANSITIONS. NOT ALL LOCATIONS WHERE FLOOR TYPES DIFFER SHALL RECEIVE TRANSITIONS. IF DISCREPANCY ARISES, CONSULT DESIGNER.
8. FLOORING TRANSITIONS MAY BE DESIGNATED BY TEXT AND/OR HATCH PATTERNS. IF DISCREPANCY ARISES, CONSULT DESIGNER.
9. UNDERCOUNTER SUPPORT BRACKETS TO BE PAINTED TO MATCH ADJACENT WALL SURFACE, UNLESS OTHERWISE NOTED.
10. ALL GYP BD, CEILINGS AND WALLS TO BE PAINTED, UNLESS OTHERWISE NOTED. SEE REFLECTED CEILING PLANS AND ELEVATIONS FOR ACCENT PAINT LOCATIONS.
11. EXPOSED CEILING STRUCTURE, INCLUDING, BUT NOT LIMITED TO PIPING, DUCTWORK, BEAMS, TRUSSES, SUPPORTS, DECKING AND SIMILAR TO BE PAINTED, UNLESS OTHERWISE NOTED.
12. GRILLES, LOUVERS, VENTS, ELECTRICAL CABINETS, AND SIMILAR TO BE PAINTED TO MATCH ADJACENT SURFACE, UNLESS OTHERWISE NOTED.
13. UNDERSIDE OF STAIR ASSEMBLIES, RAILING, STRINGERS, STAIR COLUMN, HANDRAILS, AND EXISTING METAL COMPOSITE PANEL TO BE PAINTED PT2, UNLESS OTHERWISE NOTED.
14. EXISTING GYPSUM COLUMNS TO BE PAINTED PT1, U.N.O.
15. ACCENT PAINT COLORS TO BE PAINTED CORNER TO CORNER OF NOTED WALL IN PLAN, UNLESS OTHERWISE NOTED.
16. PAINTED WALLS IN RESTROOMS AND JANITOR TO BE EPOXY PAINT, UNLESS OTHERWISE NOTED.
17. WALL TILE TO BE FULL HEIGHT IN AREAS AS SHOWN. CUT TILES TO BE AT TOP OF WALL, UNLESS OTHERWISE NOTED. ALL EXPOSED EDGES, INCLUDING TOP OF TILE BASE, TO BE FINISHED WITH METAL TRIM, UNLESS OTHERWISE NOTED.
18. IN AREAS THAT HAVE BOTH WALL TILE AND FLOOR TILE, GROUT JOINTS SHALL ALIGN ON FLOORS AND WALLS, UNLESS OTHERWISE NOTED. COORDINATE LAYOUT WITH DESIGNER PRIOR TO INSTALL.
19. IN AREAS WHERE WALL TILE IS PARTIAL HEIGHT, TOP OF EXPOSED TILE TO BE FINISHED WITH METAL TRIM, UNLESS OTHERWISED NOTED.
20. ALL EXPOSED AND/OR CUT EDGES OF CEILING TILE TO RECEIVE PAINT. PAINT TO MATCH CEILING TILE COLOR.
21. NO BASE TO BE APPLIED TO BRICK, CMU, PRECAST, STONE OR TILE WALL LOCATIONS, UNLESS OTHERWISE NOTED. IF DISCREPANCY ARISES, CONSULT DESIGNER.
22. ALL MOP SINK LOCATIONS TO RECEIVE FRP PANELS ON ADJACENT WALLS AT MOP SINK, 4'-0" HIGH, UNLESS OTHERWISE NOTED.
23. PROVIDE FINISH MOCKUPS AS INDICATED ON FINISH PLANS, INTERIOR ELEVATIONS, REFLECTED CEILING PLANS AND/OR SPEC. PROVIDE ONSITE VISITS WITH ARCHITECT/DESIGNER FOR REVIEW AS INDICATED.
24. REFERENCE INTERIOR ELEVATIONS FOR CASEWORK & OTHER VERTICAL SURFACE FINISHES.
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26. FLOORING TO BE INSTALLED TO THE EXTENT UNDER BASE CABINET LOCATIONS TYP.
27. WF1 WINDOW FILM TO BE APPLIED TO INSIDE FACE OF EXISTING GLAZING PANE COMPLETE.

FINISH BOX KEY

ROOM
RM #
WALLS
BASE
FLOORS
REMARKS

FINISH FLOOR LEGEND:

CONC1 CONC2 CPT1 CPT2
CPT3 CPT4 RF1 LVT
TL2 WOC1 EF1

WALL FINISH LEGEND:

- ACCENT PAINT, PT2
- ACCENT PAINT, PT8/EPT8
- ACCENT WALLCOVERING, WC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS
- GRAPHIC WALLCOVERING, GWC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS NOTE: DESIGN WILL BE IMPLEMENTED BY ALLOWANCE
- PLAM4, FOR PANEL REPLACEMENTS IN EXISTING ELEVATOR
- BULLET RESISTANT WALL, AS PART OF ALTERNATE 2
- WALL PROTECTION, WP1
- WINDOW FILM, WF1
- WALL TILE, TL2
- CORNER GUARD

1. COLORS, HEIGHTS AND TYPES MAY VARY. REFERENCE ELEVATIONS, CEILING PLANS, FINISH LEGEND & SPECIFICATIONS FOR MORE INFORMATION.
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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR FINISH PLAN

SHEET:
A7.12

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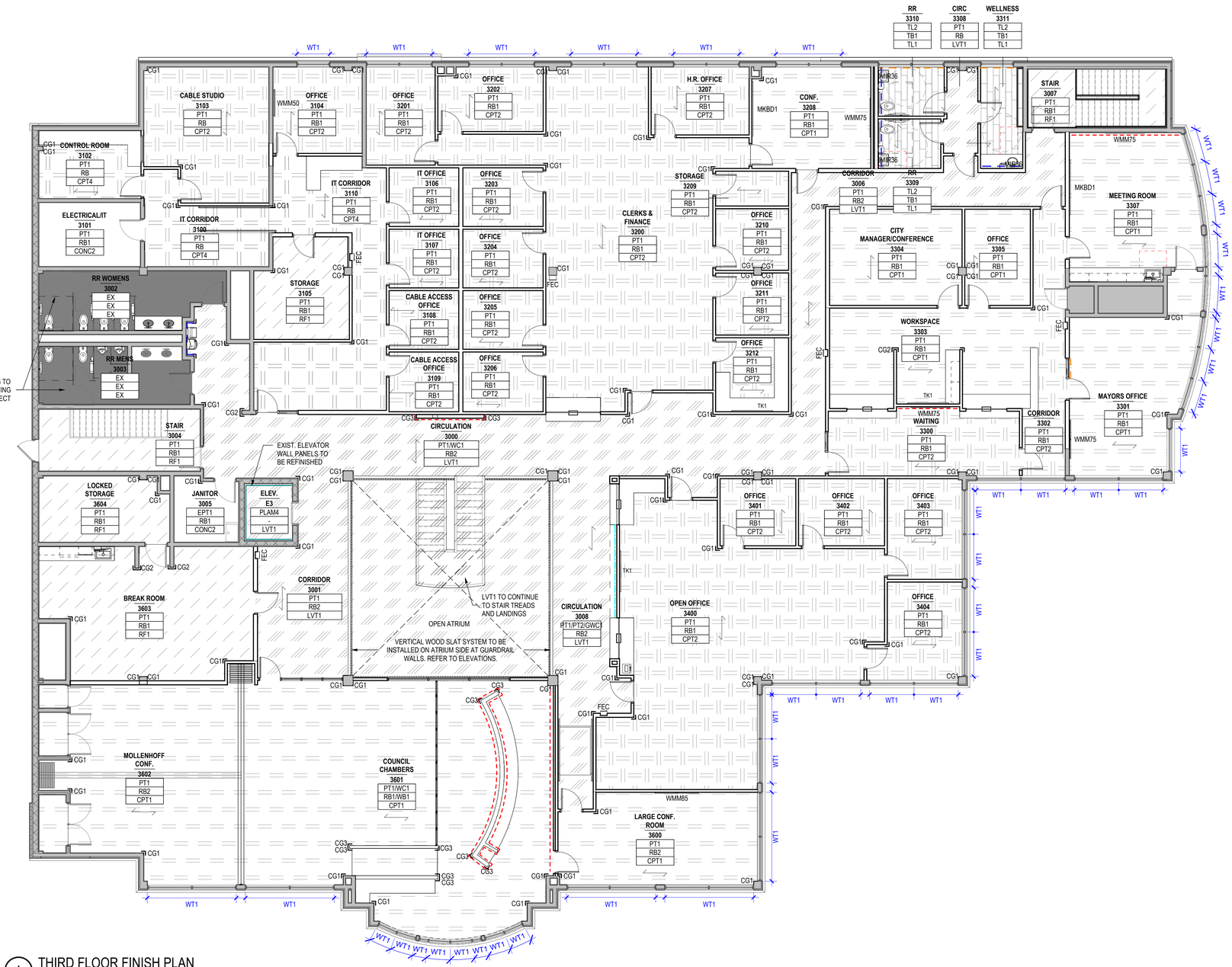

1 THIRD FLOOR FINISH PLAN
1/8" = 1'-0"

GENERAL FINISH NOTES:

1. ⟷ INDICATES FLOORING DIRECTION
2. ALL EXPOSED CONCRETE SHALL BE KEPT CLEAN AND FREE OF DEBRIS THROUGHOUT CONSTRUCTION PROCESS. INTERIOR CONCRETE TO BE SMOOTH FINISH UNLESS OTHERWISE NOTED.
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13. UNDERSIDE OF STAIR ASSEMBLIES, RAILING, STRINGERS, STAIR COLUMN, HANDRAILS, AND EXISTING METAL COMPOSITE PANEL TO BE PAINTED PT2, UNLESS OTHERWISE NOTED.
14. EXISTING GYPSUM COLUMNS TO BE PAINTED PT1, U.N.O.
15. ACCENT PAINT COLORS TO BE PAINTED CORNER TO CORNER OF NOTED WALL IN PLAN, UNLESS OTHERWISE NOTED.
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FINISH BOX KEY

ROOM
RM #
WALLS
BASE
FLOORS
REMARKS

FINISH FLOOR LEGEND:

CONC1 CONC2 CPT1 CPT2
CPT3 CPT4 RF1 LVT
TL2 WOC1 EF1

WALL FINISH LEGEND:

- ACCENT PAINT, PT2
- ACCENT PAINT, PT8/EPT8
- ACCENT WALLCOVERING, WC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS
- GRAPHIC WALLCOVERING, GWC1, LEVEL 5 FINISH REQUIRED AT ALL LOCATIONS NOTE: DESIGN WILL BE IMPLEMENTED BY ALLOWANCE
- PLAM4, FOR PANEL REPLACEMENTS IN EXISTING ELEVATOR
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- WALL PROTECTION, WP1
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- WALL TILE, TL2
- CORNER GUARD

1. COLORS, HEIGHTS AND TYPES MAY VARY. REFERENCE ELEVATIONS, CEILING PLANS, FINISH LEGEND & SPECIFICATIONS FOR MORE INFORMATION.
2. CORNERS OF ALL WOOD WALLS TO HAVE EXTRUDED ALUM CORNER PROTECTION, UNLESS OTHERWISE NOTED. SEE DETAILS.

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CONSULTANT:
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STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102
DATE: 8/26/2026
SHEET SET: BID DOCUMENTS
SHEET NAME: THIRD FLOOR FINISH PLAN
SHEET: A7.13

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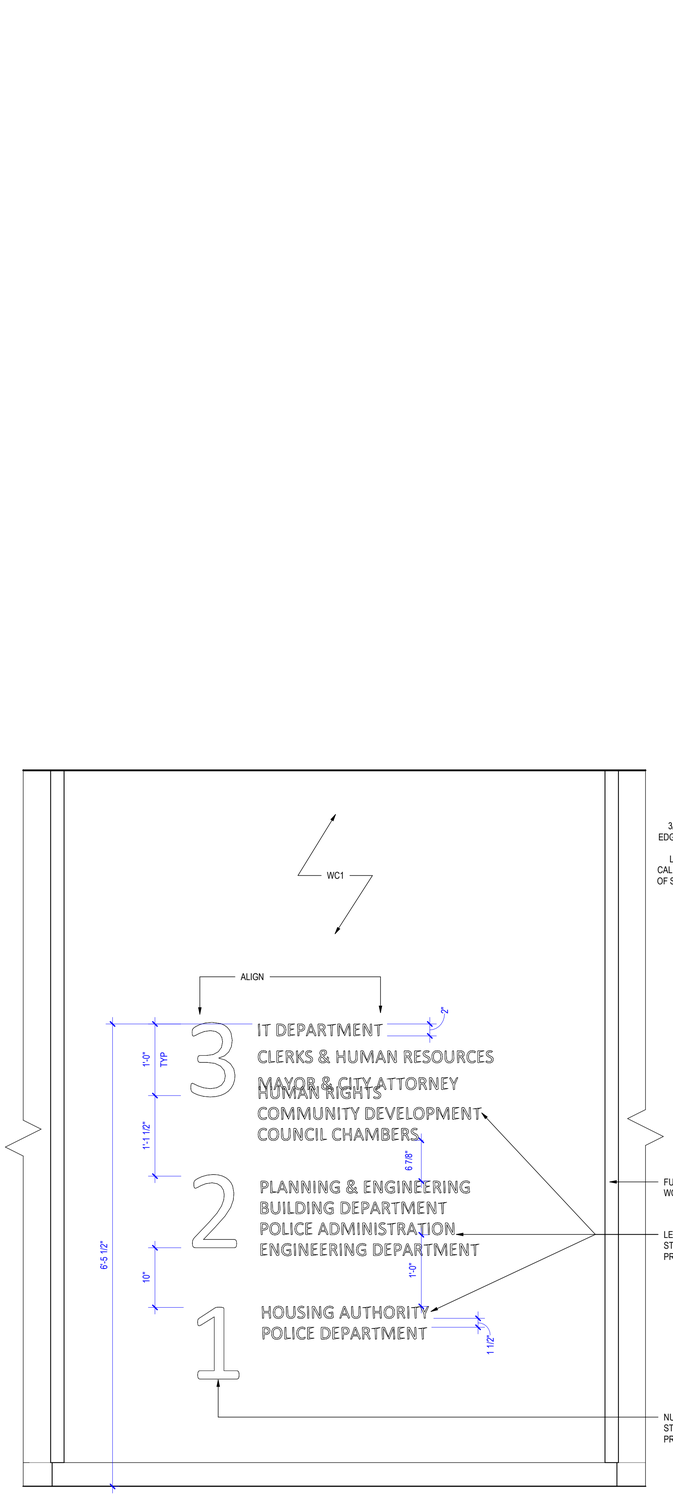
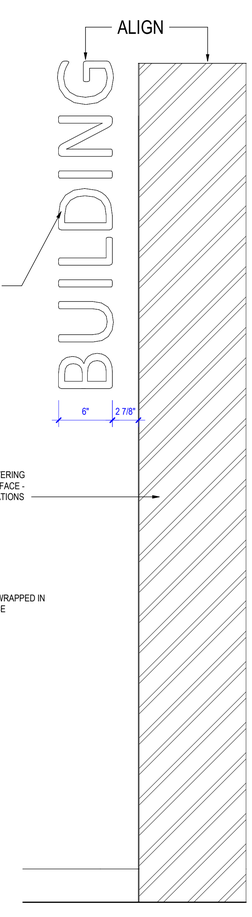
GENERAL SIGNAGE NOTES:

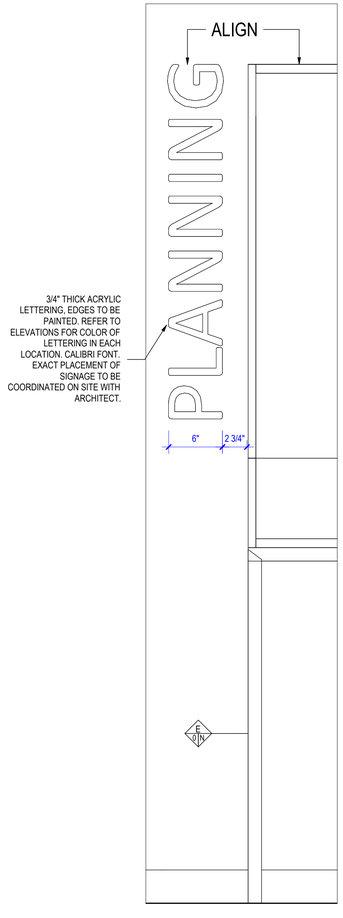
1. REFER TO SPECIFICATION FOR ADDITIONAL INFORMATION ON SIGNAGE TYPE, MATERIALS, ETC
2. ALL SIGNS ARE TO BE WALL MOUNTED OR GLASS MOUNTED. PROVIDE DERTAILS OF MOUNTING INFORMATION ON VARIOUS SUBSTRATES
3. ALL SIGNS MOUNTED TO GLASS SHALL RECEIVE FINISHED VINYL BACKER PANEL TO BE MOUNTED TO INSIDE FACE OF GLASS TO PROVIDE FINISHED AESTHETIC ON BOTH SIDES
4. SUBMIT SAMPLES OF ALL SIGN TYPES, INCLUDING MATRAILS AND COLORS FOR REVIEW AND FINAL APPROVAL ON SIGN TYPES PRIOR TO FABRICATION
5. EXACT LOCATIONS OF ALL SIGNS TO BE COORDINATED WITH ARCHITECT. ONSITE VISIT TO OCCUR PRIOR TO DIRECT APLICATION OF SIGNS
6. ALL PERMANANT MESSAGE TEXT TO BE CONFIRMED WITH OWNER
7. ADA CODE PLAQUE SIGNAGE TO BE PROVIDED FOR ALL REQUIRED LOCATIONS PER CODE, INCLUDING RESTROOMS, LOCKER ROOMS, ELEVATOR, STAIR, TORNADO SHELTER, SPRINKLER CONTROL ROOM, ETC. BASIS OF DESIGN SIGNAGE IS TO BE VISTA SYSTEM, ART ADA SIGNAGE, STYLE: SANFORD TO INCLUDE NON-GLARE ACRYLIC FACEPLATE WITH 1/4" HORIZONTAL, BRUSHED ALUMINUM ACCENT BAR, AND RAISED TEXT + BRAILLE. ARCHITECT TO SELECT COLOR(S) PER MANUFACTURER'S STANDARD RANGE.



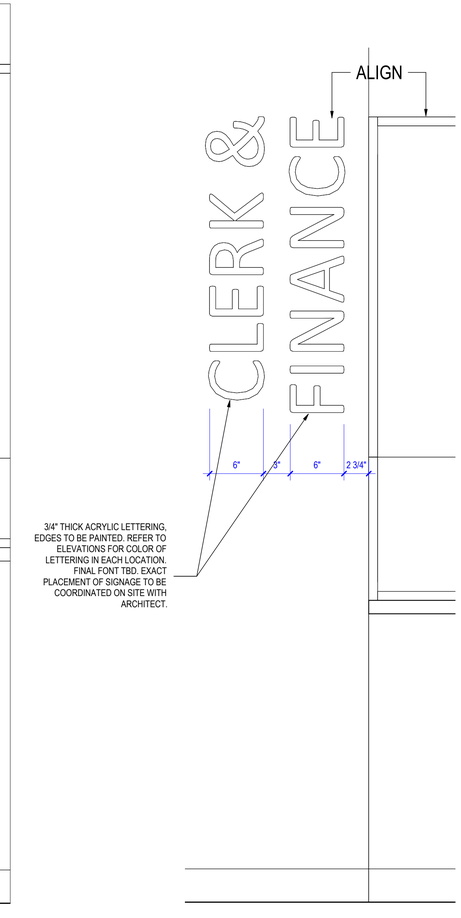
5 LOBBY WAYFINDING WALL
1" = 1'-0"



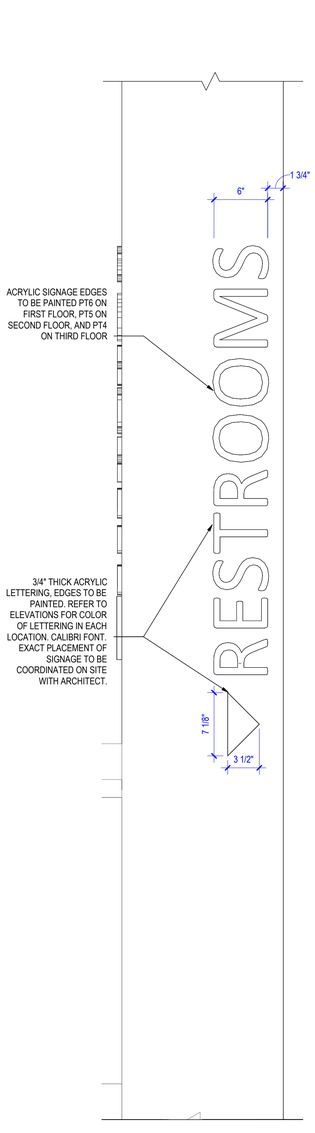
4 TRANSACTION COUNTER WITH GRAPHIC
1 1/2" = 1'-0"



3 TRANSACTION COUNTER, TYP.
1 1/2" = 1'-0"



2 ADA HEIGHT TRANSACTION SIGNAGE, TYP.
1 1/2" = 1'-0"



1 GYP. COLUMN WAYFINDING SIGNAGE
1 1/2" = 1'-0"

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CONSULTANT:
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Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
INTERIOR SIGNAGE

SHEET:
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GENERAL SIGNAGE NOTES:

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5. EXACT LOCATIONS OF ALL SIGNS TO BE COORDINATED WITH ARCHITECT. ONSITE VISIT TO OCCUR PRIOR TO DIRECT APLICATION OF SIGNS
6. ALL PERMANANT MESSAGE TEXT TO BE CONFIRMED WITH OWNER
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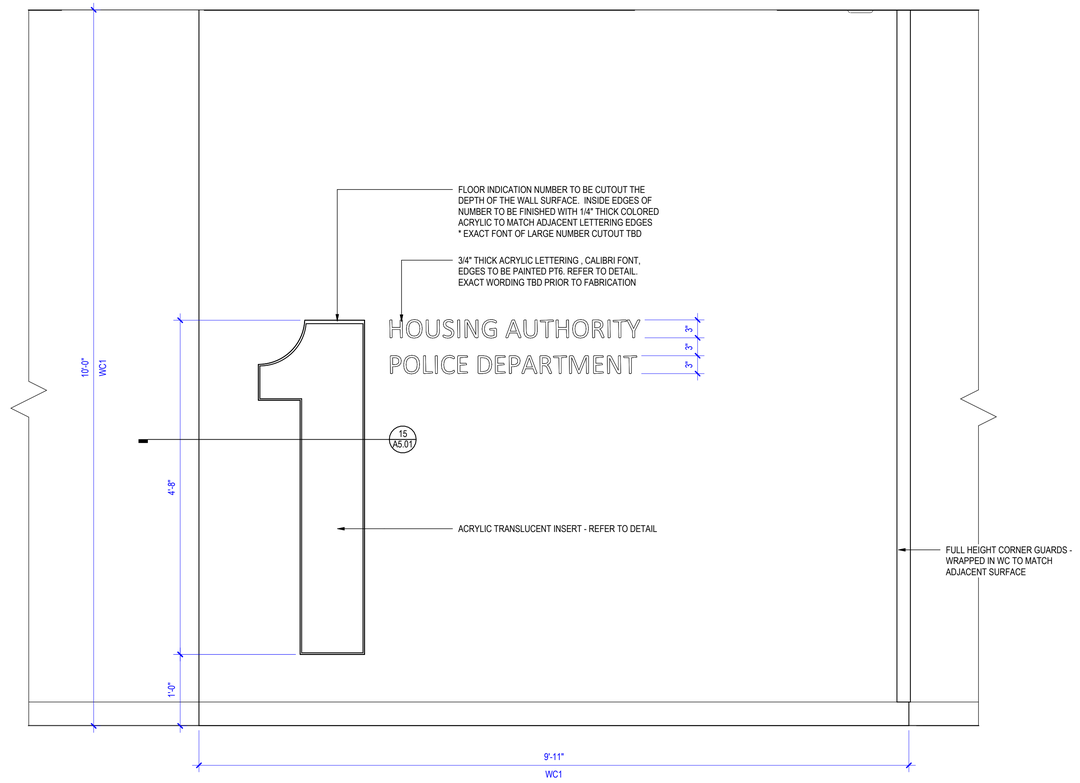
NOTE: LARGE NUMBER INDICATING FLOOR LEVEL AND DEPARTMENT LETTERING TO MATCH DETAILS OF FIRST FLOOR. EDGES TO MATCH PT4 ON THIRD FLOOR
* EXACT FONT OF LARGE NUMBER CUTOUT TBD

3 VERTICAL WAYFINDING WALL - 3RD FLOOR
1/2" = 1'-0"



NOTE: LARGE NUMBER INDICATING FLOOR LEVEL AND DEPARTMENT LETTERING TO MATCH DETAILS OF FIRST FLOOR. EDGES TO MATCH PT5 ON SECOND FLOOR
* EXACT FONT OF LARGE NUMBER CUTOUT TBD

2 VERTICAL WAYFINDING WALL - 2ND FLOOR
1/2" = 1'-0"



1 VERTICAL WAYFINDING WALL - 1ST FLOOR
1" = 1'-0"

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Waterloo, IA 50701
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CONSULTANT:
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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
INTERIOR SIGNAGE

SHEET:
A8.01

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NEW CITY HALL/POLICE HEADQUARTERS

100 E FOURTH ST WATERLOO, IA 50703

MECHANICAL SYMBOLS LIST

NOTE: NOT ALL SYMBOLS SHOWN MAY BE REQUIRED FOR THIS PROJECT

SHEET METAL

- SQUARE CEILING DIFFUSER WITH ROUND NECK
- SQUARE CEILING RETURN AIR GRILLE
- SQUARE CEILING EXHAUST OR RELIEF AIR GRILLE
- LINEAR SLOT DIFFUSER
- FLOOR REGISTER OR GRILLE
- SIDEWALL REGISTER OR GRILLE
- FLEX DUCT
- 18x12 — DUCT SIZE: HORIZONTAL (IN PLANE) WIDTH x VERTICAL (OUT OF PLANE) HEIGHT (NET OUTSIDE SHEET METAL DIMENSION)
- RECTANGULAR ELBOW WITH TURNING VANES
- CONCENTRIC DUCT REDUCER
- ECCENTRIC DUCT REDUCER
- EXISTING DUCTWORK TO BE REMOVED
- EXISTING DUCTWORK TO REMAIN
- SUPPLY AIR DUCT SECTION UP OR TOWARDS
- RETURN AIR DUCT SECTION UP OR TOWARDS
- EXHAUST AIR DUCT SECTION UP OR TOWARDS
- OUTSIDE AIR DUCT SECTION UP OR TOWARDS
- SUPPLY AIR DUCT SECTION DOWN OR AWAY
- RETURN AIR DUCT SECTION DOWN OR AWAY
- EXHAUST AIR DUCT SECTION DOWN OR AWAY
- OUTSIDE AIR DUCT SECTION DOWN OR AWAY
- DIRECTIONAL FLOW ARROW
- ??? FSD = FIRE/SMOKE DAMPER, FD = FIRE DAMPER, SD = SMOKE DAMPER CD = CONTROL DAMPER — HORIZONTAL DAMPER
- VOLUME CONTROL DAMPER
- GRILLE/DIFFUSER TAG WITH TYPE NUMBER AND CFM QUANTITY S = SUPPLY, R = RETURN, E = EXHAUST
- GRILLE/DIFFUSER TAG WITH TYPE NUMBER AND CFM QUANTITY S = SUPPLY, R = RETURN, E = EXHAUST
- VAV ? — VARIABLE AIR VOLUME (VAV) BOX WITH TYPE NUMBER
- T — THERMOSTAT
- H — HUMIDISTAT
- CO2 — CARBON DIOXIDE SENSOR
- NOx — NITROGEN OXIDE SENSOR
- CO — CARBON MONOXIDE SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- DUCT RISE
- DUCT DROP
- FLEXIBLE DUCT CONNECTOR
- CONED TAKEOFF WITH DAMPER

TEMPERATURE CONTROLS

- BDD — BACKDRAFT DAMPER
- O — MOTORIZED CONTROL DAMPER
- AF — AIR FLOW MEASURING STATION
- LP — LOW PRESSURE CUTOFF
- HP — HIGH PRESSURE CUTOFF
- SP — STATIC PRESSURE SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- LT — LOW TEMPERATURE CUTOFF
- T — DUCT TEMPERATURE SENSOR
- T — PIPE TEMPERATURE SENSOR
- C — CURRENT SENSOR
- RH — RELATIVE HUMIDITY SENSOR
- FILTER
- FAN

PLUMBING

- DOMESTIC COLD WATER LINE - CW
- DOMESTIC HOT WATER LINE - HW
- DOMESTIC HOT WATER CIRCULATING LINE - HWC
- TW — TEMPERED WATER LINE
- SCW — SOFT COLD WATER LINE
- SHW — SOFT HOT WATER LINE
- SS — SANITARY SEWER LINE
- GSS — GREASE SANITARY SEWER LINE
- ST — STORM SEWER LINE
- OFD — STORM SEWER OVERFLOW LINE
- AW — ACID WASTE LINE
- V — PLUMBING VENT LINE
- AV — ACID PLUMBING VENT LINE
- CD — CONDENSATE DRAIN LINE
- G — NATURAL GAS LINE
- LP — LIQUEFIED PETROLEUM GAS LINE
- RL — REFRIGERANT LIQUID LINE
- RS — REFRIGERANT SUCTION LINE
- HG — REFRIGERANT HOT GAS BYPASS LINE
- PD — PUMPED DISCHARGE LINE
- WW — WELL WATER LINE
- CO — CLEANOUT IN FLOOR
- CO — CLEANOUT AT OR ABOVE CEILING
- CO — CLEANOUT IN WALL
- SHOWERHEAD
- FLOOR DRAIN
- ROOF DRAIN
- S:2 — PLUMBING FIXTURE (SINK) ON ASSOCIATED LEVEL
- S — PLUMBING FIXTURE (SINK) ON LEVEL ABOVE

PIPING SPECIALTIES

- PIPE RISER
- PIPE DROP
- UNION
- PIPE CAP
- BFP — BACKFLOW PREVENTER
- FLEXIBLE PIPE CONNECTOR
- FLOAT & THERMOSTATIC TRAP
- THERMOSTATIC TRAP
- STRAINER
- STRAINER W/DRAIN VALVE
- V — AIR VENT
- PRESSURE GAUGE
- EXPANSION JOINT
- GLOBE VALVE
- BUTTERFLY VALVE
- BALL VALVE
- LUBRICATED PLUG VALVE
- GATE VALVE
- 3WAY CONTROL VALVE
- 2WAY CONTROL VALVE
- CALIBRATED BALANCE VALVE
- AUTOMATIC FLOW LIMITING VALVE
- VENTURI FLOW MEASURING STATION
- VENTURI FLOW BALANCING STATION
- CHECK VALVE
- GLOBE BALANCING VALVE
- TRIPLE DUTY VALVE
- HB — HOSE BIBB
- WH — WALL HYDRANT
- THERMOMETER
- TEMPERATURE WELL
- P/T PORT
- CURB STOP
- PIV — SPRINKLER POST INDICATOR VALVE
- PRESSURE REDUCING VALVE
- SIGHT FLOW INDICATOR

MISCELLANEOUS

- EXISTING LINE TO REMAIN
- EXISTING LINE TO BE REMOVED (ON DEMOLITION PLANS)
- POINT OF NEW CONNECTION
- DEMOLISH TO THIS POINT AND PREPARE FOR NEW CONNECTION
- DEMOLISH TO THIS POINT AND CAP
- EX — EXISTING TO REMAIN
- ER — EXISTING TO BE REMOVED
- EXR — EXISTING TO BE RELOCATED

FIRE EXTINGUISHING SYSTEM

- SPR — SPRINKLER LINE
- DSPR — DRY TYPE SPRINKLER LINE
- DRY SPRINKLER HEAD
- WET SPRINKLER HEAD
- SIDE MOUNT SPRINKLER HEAD
- FDC — PEDESTAL FIRE DEPARTMENT CONNECTION
- FDC — FIRE DEPARTMENT CONNECTION
- FS — FLOW SWITCH
- TS — SPRINKLER LINE TAMPER SWITCH

ELECTRICAL SYMBOLS LIST

NOTE: NOT ALL SYMBOLS SHOWN MAY BE REQUIRED FOR THIS PROJECT

WIRING DEVICES

- DUPLEX WALL RECEPTACLE
- DUPLEX RECEPTACLE ON BACKUP POWER
- DUPLEX WALL RECEPTACLE ABOVE COUNTER BACKSPLASH OR AS INDICATED
- DUPLEX WALL RECEPTACLE ABOVE COUNTER BACKSPLASH OR AS INDICATED ON BACKUP POWER
- GFI — DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE
- T — DUPLEX TAMPER-RESISTANT RECEPTACLE
- WP GFI — DUPLEX WEATHERPROOF GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE WITH COVER
- U — DUPLEX RECEPTACLE WITH USB CHARGER PORT
- H — DUPLEX RECEPTACLE INSTALLED HORIZONTALLY
- QUADRUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE ON BACKUP POWER
- QUADRUPLEX RECEPTACLE ABOVE COUNTER BACKSPLASH OR AS INDICATED
- SIMPLEX WALL RECEPTACLE, VERIFY POWER NEEDS
- DUPLEX CEILING RECEPTACLE
- JUNCTION BOX
- 208V WALL RECEPTACLE, VERIFY POWER NEEDS
- AUTOMATIC FAUCET/VALVE
- EPO — EMERGENCY PUSH BUTTON (GENERATORS/BOILERS)
- ADA PUSH BUTTON (BY OTHERS)

EQUIPMENT WIRING

- DISCONNECTING MEANS
- WP — WEATHERPROOF DISCONNECTING MEANS
- F — FUSED DISCONNECTING MEANS
- MS — MOTOR STARTER - REFER TO SPECIFICATIONS 26 28 16, AUTOMATIC CONTROLLERS
- $_{MS} — MOTOR RATED SWITCH
- VFD — VARIABLE FREQUENCY DRIVE W/INTEGRAL DISCONNECT

SWITCHES - LOW VOLTAGE (DIGITAL)

(REFER TO LIGHTING SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION)

- W — WALL SWITCH/STATION
- S — OCCUPANCY SENSOR WALL SWITCH
- S — CEILING MOUNT OCCUPANCY SENSOR
- L — DAYLIGHT PHOTOSENSOR
- PC — EXTERIOR PHOTOCELL

SWITCHES - LINE VOLTAGE (120/277V)

(REFER TO LIGHTING SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION)

- $ — SINGLE POLE
- $_3 — 3-WAY SWITCH
- $_4 — 4-WAY SWITCH

DISTRIBUTION

- SURFACE-MOUNT PANEL
- FLUSH-MOUNT PANEL
- TRANSFORMER
- C/T CABINET
- M — METER

COMMUNICATIONS SYSTEMS

- TELEPHONE OUTLET IN WALL
- TELEPHONE OUTLET ABOVE COUNTER BACKSPLASH
- W — TELEPHONE OUTLET FOR WALL MOUNTED TELEPHONE
- # — DATA OUTLET IN WALL W/ # OF JACKS
- DATA OUTLET ABOVE COUNTER BACKSPLASH
- DATA OUTLET IN CEILING
- WAP — WIRELESS ACCESS POINT
- COMBINATION PHONE/DATA OUTLET IN WALL
- COMBINATION PHONE/DATA OUTLET ABOVE COUNTER
- TELEVISION OUTLET IN WALL
- TELEVISION OUTLET IN CEILING
- WALL HORN INDICATOR
- CEILING SPEAKER
- IC — INTERCOM PUSH BUTTON
- AV_W — AUDIO VISUAL OUTLET IN WALL
- AV_F — AUDIO VISUAL OUTLET IN FLOOR
- C — CLOCK LOCATION
- C_DF — CLOCK LOCATION - DOUBLE FACE

LUMINAIRES

- 2'x2' RECESSED TROFFER FIXTURE W/TYPE NUMBER
- 2'x4' RECESSED TROFFER FIXTURE W/TYPE NUMBER
- RECESSED LINEAR FIXTURE W/TYPE NUMBER
- SURFACE MOUNT LINEAR FIXTURE W/TYPE NUMBER
- WALL MOUNT LINEAR FIXTURE W/TYPE NUMBER
- SURFACE/CEILING MOUNT STRIP FIXTURE W/TYPE NUMBER
- SUSPENDED MOUNT STRIP FIXTURE W/TYPE NUMBER
- SURFACE MOUNT FIXTURE W/TYPE NUMBER
- RECESSED DOWNLIGHT FIXTURE W/TYPE NUMBER
- PENDANT MOUNT FIXTURE W/TYPE NUMBER
- WALL MOUNT FIXTURE W/TYPE NUMBER

EXIT & EMERGENCY

- SINGLE FACE CEILING MOUNTED EXIT SIGN W/ILLUMINATED FACE AND DIRECTION
- DOUBLE FACE CEILING MOUNTED EXIT SIGN W/ILLUMINATED FACE(S) AND DIRECTION INDICATED
- WALL MOUNTED EXIT SIGN W/DIRECTION INDICATED
- EDGE MOUNTED EXIT SIGN W/ILLUMINATED FACE(S) AND DIRECTION INDICATED
- EMERGENCY BATTERY PACK
- ROUND CEILING MOUNT EMERGENCY LIGHT FIXTURE W/ TYPE AND CIRCUIT INDICATED ON PLANS (FULL SHADE)
- RECTANGULAR CEILING MOUNT EMERGENCY LIGHT FIXTURE W/ TYPE AND CIRCUIT INDICATED ON PLANS (FULL SHADE)

FIRE ALARM & DETECTION

- DUCT SMOKE DETECTOR
- SMOKE DETECTOR - CEILING MOUNTED
- S — SMOKE DETECTOR WITH SOUNDER BASE
- CO — COMBINATION SMOKE/CO DETECTOR
- R — HEAT DETECTOR - RATE OF RISE
- F — HEAT DETECTOR - FIXED TEMPERATURE
- F — FIRE ALARM PULL STATION
- FIRE ALARM HORN/STROBE - WALL MOUNTED
- FIRE ALARM HORN/STROBE - CEILING MOUNTED
- S — FIRE ALARM SPEAKER - WALL MOUNTED
- S — FIRE ALARM SPEAKER - CEILING MOUNTED
- FIRE ALARM SPEAKER/STROBE - WALL MOUNTED
- FIRE ALARM SPEAKER/STROBE - CEILING MOUNTED
- FIRE ALARM STROBE LIGHT - WALL MOUNTED
- FIRE ALARM STROBE LIGHT - CEILING MOUNTED
- R — FIRE ALARM RELAY
- DH — FIRE ALARM HOLD OPEN CONNECTION
- FSD — FIRE/SMOKE DAMPER CONNECTION
- TS — SPRINKLER TAMPER SWITCH MONITORING
- FS — SPRINKLER FLOW SWITCH MONITORING
- PIV — POST INDICATOR VALVE MONITORING
- FACP — FIRE ALARM CONTROL PANEL
- FAAP — FIRE ALARM ANNUNCIATOR PANEL
- ECB — EMERGENCY CALL BOX
- MM — MONITOR MODULE
- KS — KEY SWITCH

MISCELLANEOUS

- EX — EXISTING - TO REMAIN
- EXR — EXISTING - TO BE RELOCATED
- ER — EXISTING - TO BE REMOVED
- CONDUIT SECTION UP OR TOWARDS
- CONDUIT SECTION DOWN OR AWAY
- SWITCH-LEG IN CONDUIT
- UC — UNDER GROUND CONDUIT
- EC — EMPTY CONDUIT
- POINT OF NEW CONNECTION
- DEMOLISH TO THIS POINT AND PREPARE FOR NEW CONNECTION
- DEMOLISH TO THIS POINT AND CAP
- WP — WEATHERPROOF
- AFF — ABOVE FINISHED FLOOR
- AFG — ABOVE FINISH GRADE
- WM — DEVICE ON WIREMOLD
- WG — WIRE GUARD
- [FS] — FIRE STOP
- [=EZ-#"=] — EZ PATH PASS-THROUGH
- [=#" C=] — CONDUIT PASS-THROUGH

ACCESS CONTROL

- DC — DOOR CONTACT
- CR — PROXIMITY CARD READER
- CM — MULLION MOUNT CARD READER
- KP — KEYPAD
- PB — PUSHBUTTON
- DB — DURESS BUTTON
- RX — REQUEST TO EXIT (WALL OR CEILING MOUNTED)
- PTE — PUSH TO EXIT (WALL BUTTON)
- TES — TELEPHONE ENTRY SYSTEM
- SECURITY CAMERA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. My license renewal date is December 31, 2027.

AARON J. OLTMANN LICENSED 26063 IOWA PROFESSIONAL ENGINEER

Aaron J. Oltmann 08/26/2026

Aaron J. Oltmann — Date

Pages or sheets covered by this seal:
Specification Div.: 21, 22, 23
Drawings: SEE SHEET INDEX

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. My license renewal date is December 31, 2027.

STEVEN F. WAGNER LICENSED 19712 IOWA PROFESSIONAL ENGINEER

Steven F. Wagner 08/26/2026

Steven F. Wagner — Date

Pages or sheets covered by this seal:
Specification Div.: 26, 27, 28
Drawings: SEE SHEET INDEX

SHEET INDEX

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ME0.02	MEPT ROOF PLAN
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FP1.02	SPRINKLER SECOND FLOOR PLAN
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FP5.01	SPRINKLER DETAILS AND SCHEDULES
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PD1.11	FIRST FLOOR PLUMBING DEMOLITION PLAN
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T3.01	ENLARGED PLANS LOW VOLTAGE
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T4.01	IT CLOSET MAPPING
T4.02	LOW VOLTAGE ADD ALTERNATE PLAN VIEWS
T5.01	LOW VOLTAGE DETAILS
T5.02	LOW VOLTAGE DETAILS
T5.03	LOW VOLTAGE DETAILS
T5.04	LOW VOLTAGE DETAILS
T5.05	LOW VOLTAGE ALTERNATE DETAILS

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NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST, WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: MEPT SYMBOLS LIST

SHEET: ME0.00

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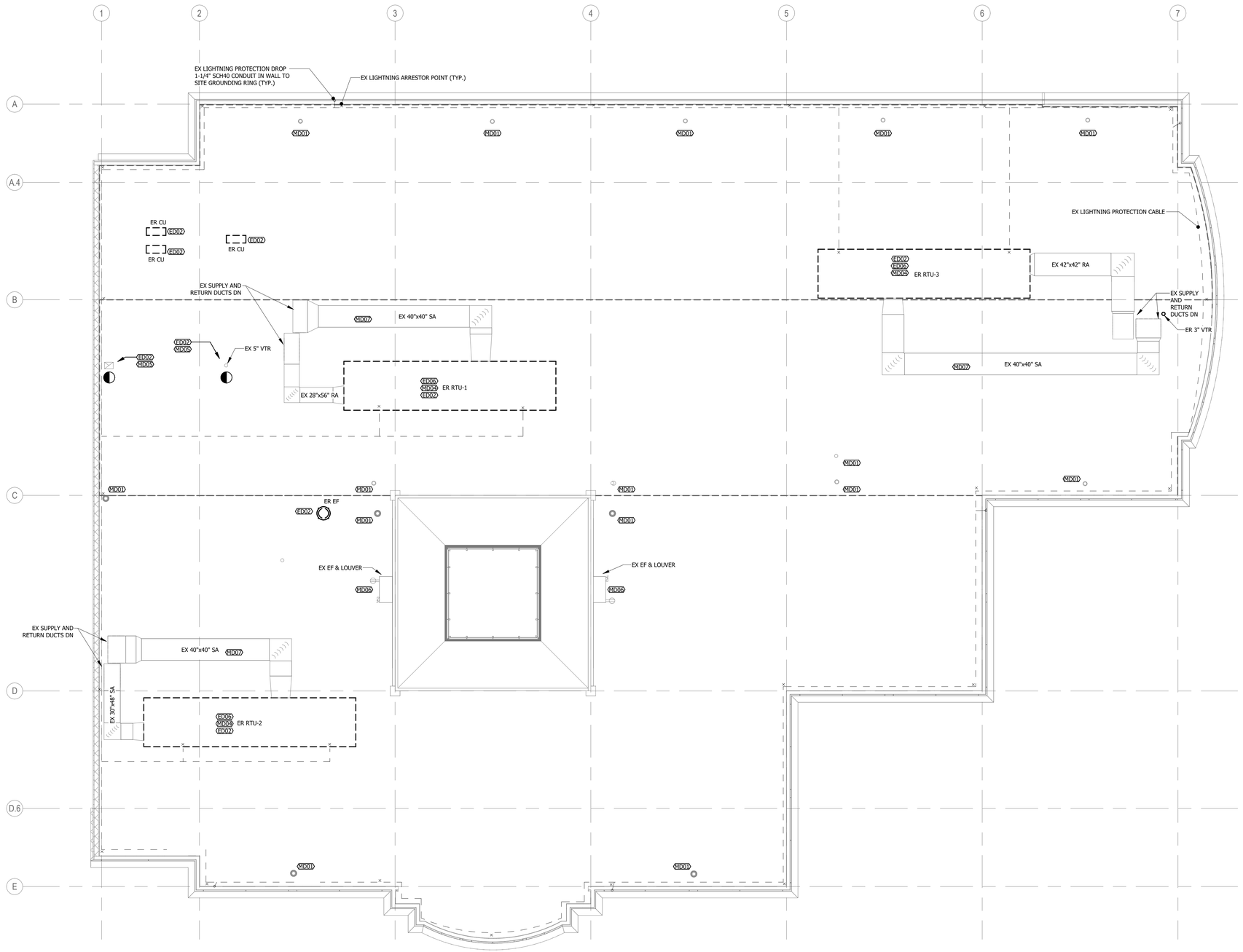

1 MECHANICAL DEMOLITION ROOF
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL MECHANICAL EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING MECHANICAL AND ELECTRICAL SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

ED02 ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE ELECTRICAL DISCONNECT, CONDUCTORS, AND RACEWAY FOR MECHANICAL EQUIPMENT TO BE REMOVED. CONDUCTORS AND RACEWAY SHALL BE REMOVED BACK TO SOURCE PANEL. COORDINATE WITH MECHANICAL DRAWINGS.

ED06 ELECTRICAL CONTRACTOR SHALL CAREFULLY REMOVE AND PROTECT THE EXISTING LIGHTNING ROD AND ALL ASSOCIATED APPURTENANCES FROM THE EXISTING RTU. THE EXISTING LIGHTNING ROD AND ASSOCIATED COMPONENTS SHALL BE REUSED AND REINSTALLED ON THE NEW RTU.

MD01 ROOF DRAINS TO BE DEMOLISHED AND REPLACED WITH EQUAL. REFER TO NEW ROOF PLAN FOR NEW ROOF DRAIN TAG. COORDINATE INSTALLATION WITH NEW ROOFING SCOPE OF WORK.

MD04 ROOFTOP UNITS (RTU) SHALL BE REMOVED AND REPLACED. PROVIDE CURB ADAPTORS AS REQUIRED TO SET NEW UNITS ON EXISTING CURB. COORDINATE INSTALLATION WITH NEW ROOFING WORK.

MD05 DEMO EXISTING FAN AND CAP DUCT TO PREPARE FOR NEW FAN INSTALLATION. REFER TO MECH FLOOR PLAN M1.31 FOR NEW FAN SELECTION.

MD06 EXISTING FAN AND LOUVERS TO REMAIN. EXHAUST FANS TO BE PROVIDED WITH KEY SWITCH FOR OPERATION OF ON/OFF. REFER TO LOW VOLTAGE PLANS FOR KEYED SWITCH LOCATION. MOTORIZED DAMPER TO OPEN WHEN EXHAUST FAN RUNS.

MD07 REMOVE AND REINSTALL ROOF MOUNTED DUCTWORK AND SUPPORTS AS REQUIRED FOR REROOFING SCOPE. REPAIR DAMAGED ROOF MOUNTED DUCTWORK AND SUPPORTS AS REQUIRED.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

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8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
MEPT ROOF
DEMOLITION PLAN

SHEET:
MED0.02

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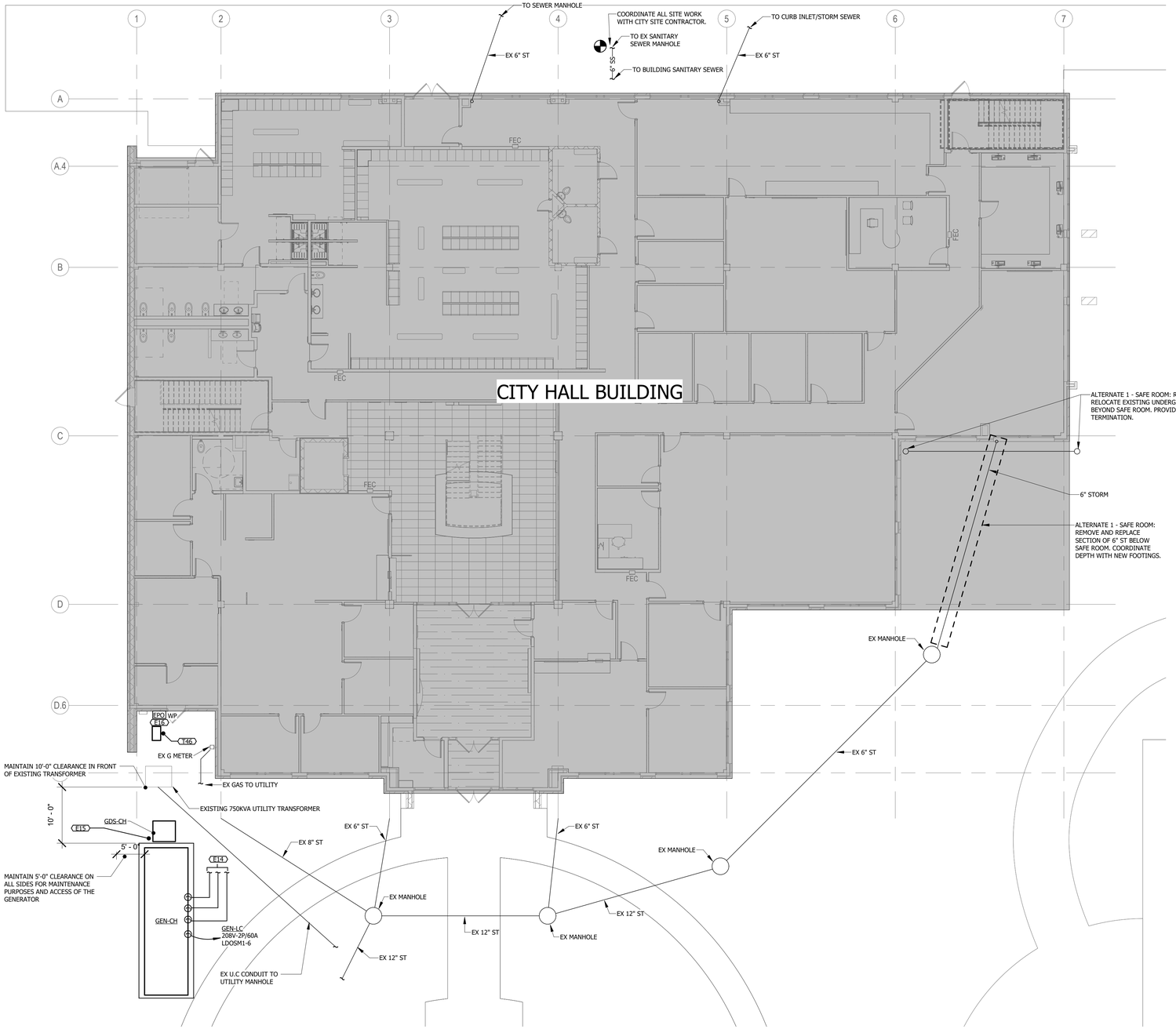

N

1 MEPT SITE PLAN
1" = 10'-0"

GENERAL NOTES:

A. UTILITIES SHOWN ARE INDICATED SCHEMATICALLY. CONTRACTORS SHALL VERIFY ALL DEPTHS AND ALL LOCATIONS/ DIMENSIONS PRIOR TO EXCAVATING. ALL UTILITIES MAY NOT BE SHOWN.

B. COORDINATE WITH CITY'S CIVIL CONTRACTOR FOR 5TH STREET WORK AS NEEDED.

C. ALL UNDERGROUND UTILITIES, PIPING, ETC. SHALL BE LOCATED EXACTLY BEFORE DIGGING.

D. ANY BACKFILL SHALL BE TAMPED AND COMPACTED TO PREVENT FUTURE SETTLING. ALL EXCESS DIRT SHALL BE CLEARED FROM THE AREA AND DISPOSED OF.

E. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL REPAIR ALL DISTURBED SURFACES SUCH AS SIDEWALKS, DRIVEWAYS, STREETS, GRASS, AND CONCRETE. REPLACED SURFACES SHALL MATCH EXISTING.

F. COORDINATE ALL EXTERIOR SITE LIGHTING FIXTURES WITH DESIGN TEAM PRIOR TO INSTALLATION.

G. CONTRACTOR IS RESPONSIBLE FOR DOING ALL WORK PER LOCAL RESPECTIVE UTILITY REQUIREMENTS.

H. VERIFY EXACT LOCATIONS OF UTILITY CONNECTIONS, PRIOR TO START OF WORK.

REFERENCED NOTES

E14 PROVIDE CONDUIT AND WIRE FROM GENERATOR TO EPO, TRANSFER SWITCHES, AND REMOTE ANNUNCIATOR. (1) 1" CONDUIT EACH FOR TRANSFER SWITCHES, EPO, AND ANNUNCIATOR. REFER TO SHEET E1.01 FOR REMOTE ANNUNCIATOR LOCATION.

E15 CONCRETE PAD BY STRUCTURAL CONTRACTOR FOR GENERATOR ASSOCIATED EQUIPMENT. PAD SHALL EXTEND MINIMUM 1'-0" AROUND EQUIPMENT. REFER TO SPECIFICATIONS AND DETAIL FOR ADDITIONAL INFORMATION.

E16 REMOTE GENERATOR SHUTDOWN PER NFPA 110. COORDINATE EXACT LOCATION WITH OWNER AND AHJ PRIOR TO ROUGH-IN. PROVIDE WIRE AND CONDUIT TO GENERATOR CONTROL PANEL.

T46 EXISTING TELECOM HANDHOLE. STRUCTURED CABLING CONTRACTOR SHALL COORDINATE WITH TELECOM UTILITY TO PULL BACK AND REINSTALL EXISTING FIBER SERVICE FOR BUILDING. ELECTRICAL CONTRACTOR SHALL PROVIDE THREE (3) 4" PATHWAYS FROM EXISTING TELECOM HANDHOLE TO ELECTRICAL/IT STORAGE 2008. HANDHOLE SHALL NOT CONTAIN ANY SLACK LOOPS OR ENCLOSURES.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: SITE PLAN

SHEET: ME0.01

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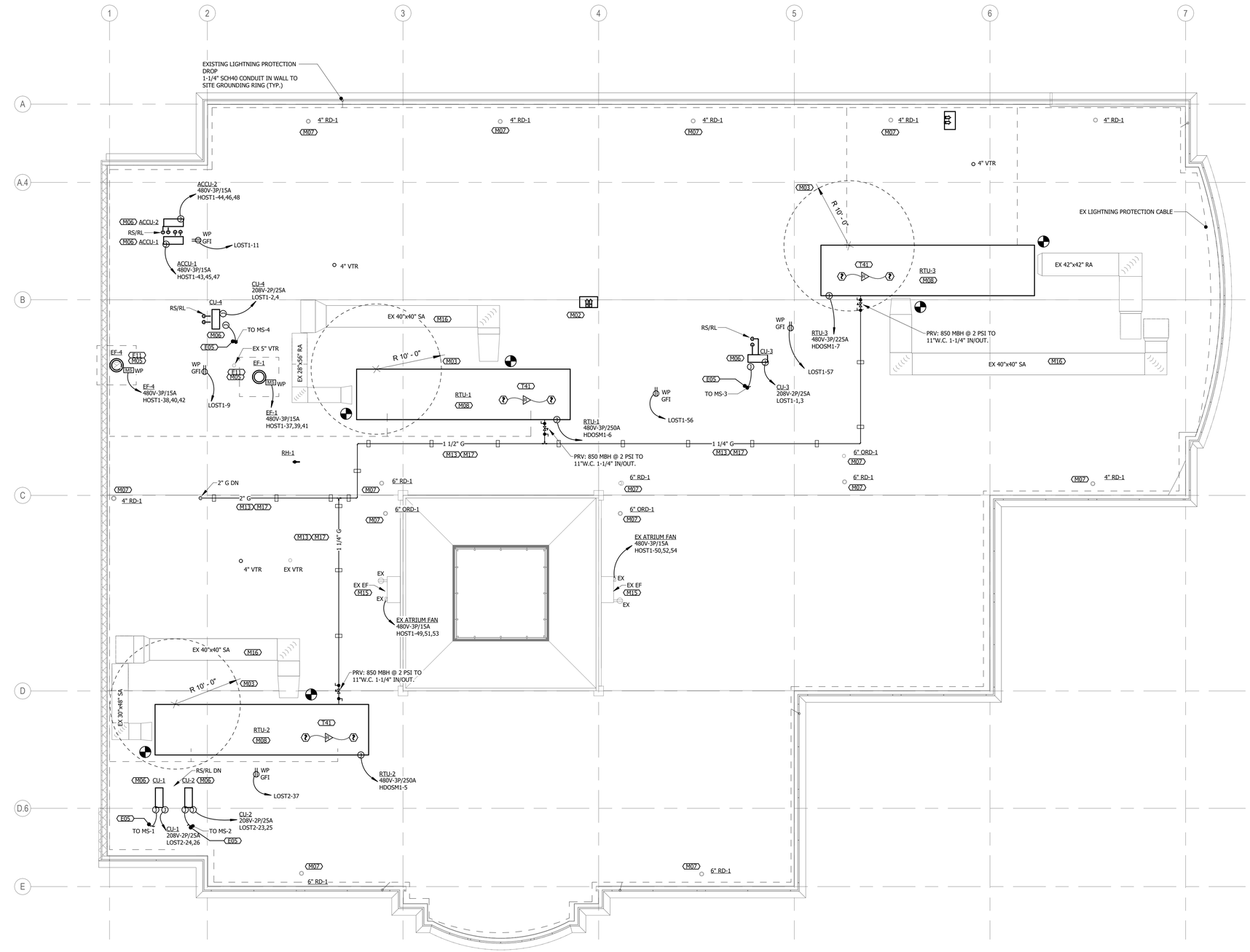

1 MECHANICAL ROOF PLAN
1/8" = 1'-0"

GENERAL NOTES:

A. LAYOUT AND ROUTING SHOWN IS DIAGRAMMATIC AND SCHEMATIC IN NATURE. NOT ALL OFFSETS MAY BE SHOWN. CONTRACTOR SHALL VERIFY EXACT ROUTING REQUIRED AND NUMBER OF OFFSETS AND TRANSITIONS. CONTRACTOR TO VERIFY AND COORDINATE PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

B. COORDINATE DUCT AND PIPE ROUTING WITH STRUCTURAL AND ALL TRADES.

C. COORDINATE DUCT AND PIPE ROUTING IN LOCATIONS WITH EXISTING CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO ROUGH-IN.

D. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

E. MAINTAIN SERVICE AND OPERATIONAL CLEARANCE AROUND AND ABOVE ALL NEW AND EXISTING MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING, DUCTWORK OR CONDUITS WITHIN MANUFACTURER'S CLEARANCE SPACE. DO NOT INSTALL EQUIPMENT OR EQUIPMENT SCREENING IN CLEARANCE SPACE.

F. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.

G. CONTRACTOR SHALL INSTALL ALL FRESH AIR INTAKES A MINIMUM OF 10' FROM ALL EXHAUST AND PLUMBING VENTS. OFFSET PIPING AS NECESSARY.

H. CONTRACTOR SHALL FIELD VERIFY ACTUAL ROUTING FOR REFRIGERANT PIPING. SIZE PIPING PER MANUFACTURER'S RECOMMENDATIONS.

I. ALL ROOF EQUIPMENT THAT REQUIRES SERVICE SHALL BE INSTALLED A MINIMUM OF 10 FEET FROM THE ROOF EDGE WITH A HEIGHT DIFFERENCE GREATER THAN 30 INCHES OR AS REQUIRED BY STATE AND LOCAL CODES. PROVIDE OSHA APPROVED FALL PROTECTION AT ANY ROOF EQUIPMENT THAT DOES NOT MEET THIS REQUIREMENT.

REFERENCED NOTES

E05 PROVIDE A SINGLE POINT POWER CONNECTION BETWEEN INDOOR UNIT AND OUTDOOR UNIT. ALL INTERCONNECTED WIRING SHALL BE BY ELECTRICAL CONTRACTOR. COORDINATE WITH MECHANICAL CONTRACTOR.

E11 MECHANICAL CONTRACTOR SHALL PROVIDE A PRE-WIRED FUSED SAFETY DISCONNECT (UNLESS INCLUDED WITH VFD) AND STARTER FOR ALL 3 PHASE EQUIPMENT. PROVIDE 120V POWER FOR STARTER RELAY.

M02 SEE ROOF EXHAUST CURB DETAIL 1 ON SHEET M5.02.

M03 OUTSIDE AIR INTAKE TO BE MINIMUM 10'-0" FROM ALL EXHAUST/VENT.

M05 SEE ROOF MOUNTED EXHAUST FAN DETAIL 3 ON SHEET M5.02.

M06 SEE SPLIT SYSTEM OUTDOOR UNIT DETAIL 4 ON SHEET M5.02.

M07 ROOF DRAINS TO BE DEMOLISHED AND REPLACED WITH EQUAL.

M08 RTU UNITS SHALL BE PROVIDED WITH CURB ADAPTORS AS REQUIRED TO SET NEW UNITS ON EXISTING CURB. EXTEND EXISTING DUCTWORK AS REQUIRED TO MAKE CONNECTION TO NEW RTU. REPAIR/REPLACE ANY DAMAGED ROOF MOUNTED DUCTWORK.

M13 PAINT ALL GAS PIPING WITH TWO (2) COATS OF RUST RESISTANT PAINT. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THIS WORK.

M15 EXISTING FAN AND LOUVERS TO REMAIN. EXHAUST FANS TO BE PROVIDED WITH KEY SWITCH FOR OPERATION OF ON/OFF. REFER TO LOW VOLTAGE PLANS FOR KEYED SWITCH LOCATION. MOTORIZED DAMPER TO OPEN WHEN EXHAUST FAN RUNS.

M16 REMOVE AND REINSTALL ROOF MOUNTED DUCTWORK AND SUPPORTS AS REQUIRED FOR REROOFING SCOPE. REPAIR DAMAGED ROOF MOUNTED DUCTWORK AND SUPPORTS AS REQUIRED.

M17 SUPPORT NEW GAS PIPE ON ROOF AT LEAST EVERY 10 FEET. ROOF SUPPORT EQUAL TO COOPER B-LINE MODEL #DB10. (TYP.)

T41 HVAC UNIT ABOVE 2,000 CFM. FIRE ALARM CONTRACTOR SHALL PROVIDE DUCT SMOKE DETECTION ON THE SUPPLY AND RETURN SIDE OF THIS UNIT. CONNECT EACH DUCT SMOKE DETECTOR TO A FAN SHUTDOWN RELAY. COORDINATE PROGRAMMING AND SHUTDOWN SEQUENCE WITH MECHANICAL CONTRACTOR. FOLLOW NFPA 72 AND MANUFACTURER RECOMMENDATIONS FOR INSTALLATION.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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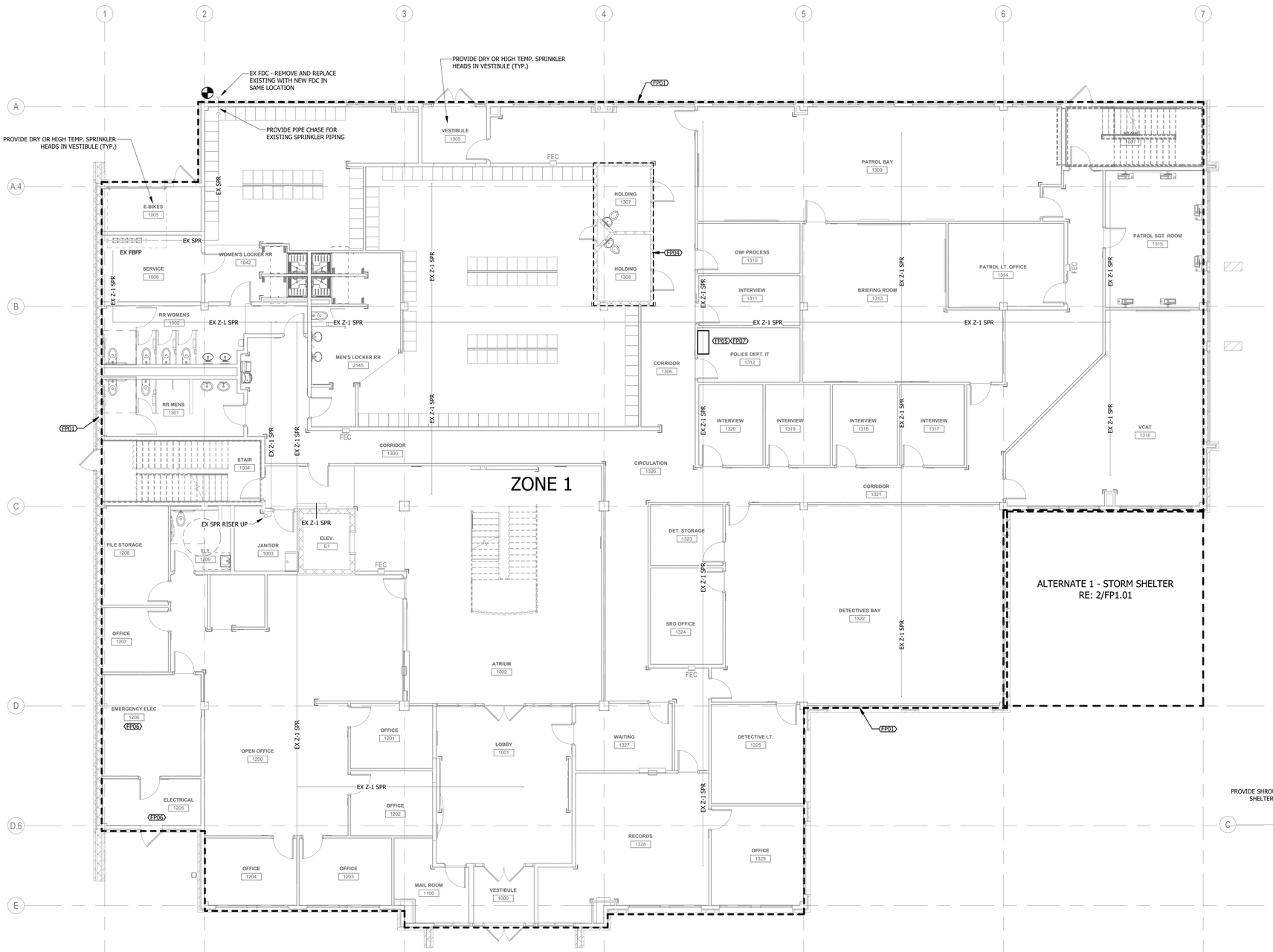
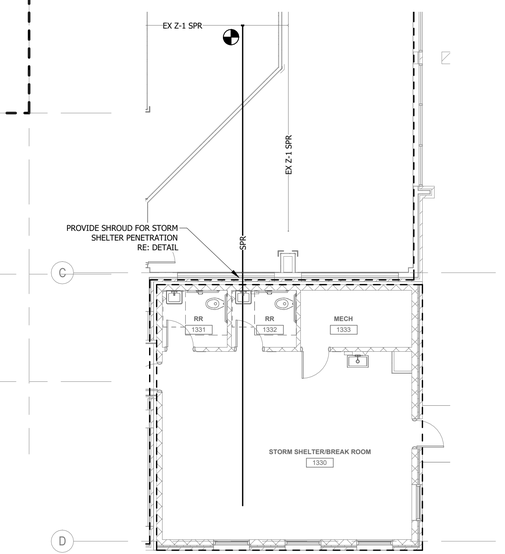


1 FIRE PROTECTION FIRST FLOOR
1/8" = 1'-0"



2 FIRE PROTECTION - ALTERNATE 1
1/8" = 1'-0"

GENERAL NOTES:

A. SPRINKLER SYSTEMS SHALL BE DESIGNED TO 100% COVERAGE BY NFPA-13 AND OTHER APPLICABLE CODES. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE ACTUAL NUMBER OF HEADS AND HEAD SPACING REQUIRED TO PROTECT THE AREA IN ACCORDANCE WITH NFPA REQUIREMENTS FOR THE APPROPRIATE HAZARD CLASSIFICATION. USE RETURN BENDS TO LOCATE SPRINKLER HEADS IN THE CENTER OF CEILING TILES.

B. THE DRAWINGS ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE ROUTING. CONTRACTOR SHALL FIELD ROUTE PIPING THROUGH THE (EXISTING) BUILDING TO AVOID INTERFERENCE'S WITH (EXISTING) STRUCTURE, EQUIPMENT, DUCTWORK, PIPING, LIGHTING, AND CONDUIT. CONCEAL PIPING WHERE POSSIBLE.

C. THE CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING, PATCHING, PAINTING, AND FIRE-STOPPING OF (EXISTING) WALLS, FLOORS AND CEILINGS NECESSARY FOR THE INSTALLATION OF WORK UNLESS NOTED OTHERWISE. ALL PENETRATIONS THRU RATED WALLS, FLOORS, AND CEILING SHALL BE FIRE-STOPPED/WATER-PROOFED TO MATCH THE RATING OF THE WALL, FLOOR, AND/OR CEILING.

D. ALL SPRINKLER PIPING SHALL BE INSTALLED SUCH THAT THE SYSTEM WILL COMPLETELY DRAIN BACK TO MAIN. IF A SECTION OF PIPING CANNOT BE SLOPED BACK TO MAIN, AN AUXILIARY DRAIN VALVE WITH PERMANENT LABEL AND HOSE THREAD CONNECTION MUST BE INSTALLED BY THIS CONTRACTOR. ALL AUXILIARY DRAINS SHOULD BE CONCEALED FROM THE OCCUPIED SPACE.

E. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS ON OTHER SHEETS FOR ADDITIONAL INFORMATION ON CONSTRUCTION AND COORDINATION NEEDS OF OTHER TRADES.

F. COORDINATE SPRINKLER HEAD LOCATIONS WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO AVOID POSSIBLE CONFLICTS.

G. SPRINKLER CONTRACTOR SHALL USE CONCEALED HEADS IN ALL FINISHED SPACES AND EXPOSED HEADS IN OPEN CEILING SPACES. REFER TO SPECIFICATIONS FOR SECURITY CAGE LOCATIONS.

H. CLEAN AGENT SYSTEM TO BE USED IN DATA ROOMS, ELECTRICAL ROOMS AND TELECOMMUNICATIONS ROOM AS INDICATED ON DRAWINGS AND SPECIFICATIONS.

I. FIRE SPRINKLER CONTRACTOR SHALL INSTALL NEW SPRINKLER HEADS WHERE REQUIRED AT EXISTING ELEVATOR TO MEET NFPA 13 AND ELEVATOR CODE.

J. ROUTE MAINS AND BRANCH PIPING ABOVE BOTTOM OF JOISTS WHEN PARALLEL TO JOISTS AND THROUGH JOISTS WHEN THEY RUN PERPENDICULAR TO JOISTS.

K. SPRINKLER CONTRACTOR SHALL REUSE AS MUCH OF THE EXISTING PIPING AS POSSIBLE. COORDINATE PIPING ROUTING WITH OTHER TRADES. INSTALL NEW HEADS.

L. PHASE INSTALLATION OF NEW WORK TO KEEP EXISTING WATER SERVICE AND AREAS OF EXISTING FIRE PROTECTION OPERATIONAL DURING INSTALLATION OF NEW WORK.

M. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES AND CLERESTORY LOCATIONS.

REFERENCED NOTES

FP01 MODIFY EXISTING SPRINKLER SYSTEM WITHIN THIS AREA TO PROVIDE ADEQUATE COVERAGE PER NFPA 13. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR CEILING TYPES. SPRINKLER HEADS IN THIS AREA SHALL BE FULLY REPLACED WITH NEW HEADS. USE WHITE CONCEALED STYLE HEADS IN ALL FINISHED AREAS.

FP04 PROVIDE INSTITUTIONAL VANDAL RESISTANT/ANTI LIG SPR HEADS WITHIN BOUNDARY AREA.

FP05 PROVIDE NEW JANUS FK-5-1-12 NOVEC 1230, OR ENGINEER APPROVED EQUAL, CLEAN AGENT SYSTEM WITH POTTER DETECTION AND CONTROLS FOR ELECTRICAL ROOM. REFER TO DETAIL 5/FP5.01 INCLUDE AGENT CYLINDERS, DISTRIBUTION PIPING, DISCHARGE NOZZLES, DETECTION, RELEASING CONTROLS, MANUAL RELEASE, ABORT STATION, PRESSURE RELIEF, AND ALL REQUIRED FIRE ALARM AND HVAC INTERLOCKS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

FP06 DO NOT ROUTE ANY SPRINKLER PIPING THROUGH AV/DATA/ELECTRICAL ROOMS. ALL SPRINKLER HEADS SHALL BE SIDEWALL HEADS. DO NOT PLACE DIRECTLY ABOVE EQUIPMENT.

FP07 PROVIDE ALL REQUIRED SMOKE DETECTION, CONDUIT, WIRING AND ACCESSORIES FOR POWER AND CONTROL FOR A COMPLETE WORKING FIRE SUPPRESSION SYSTEM. COORDINATE WORK WITH THE ELECTRICAL CONTRACTOR AND ALL TRADES. CONNECT TO FIRE ALARM CONTROL PANEL. ALL COSTS ASSOCIATED WITH THE ABOVE MENTIONED WORK SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.

NOTE:
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SPRINKLER FIRST FLOOR PLAN

SHEET:
FP1.01

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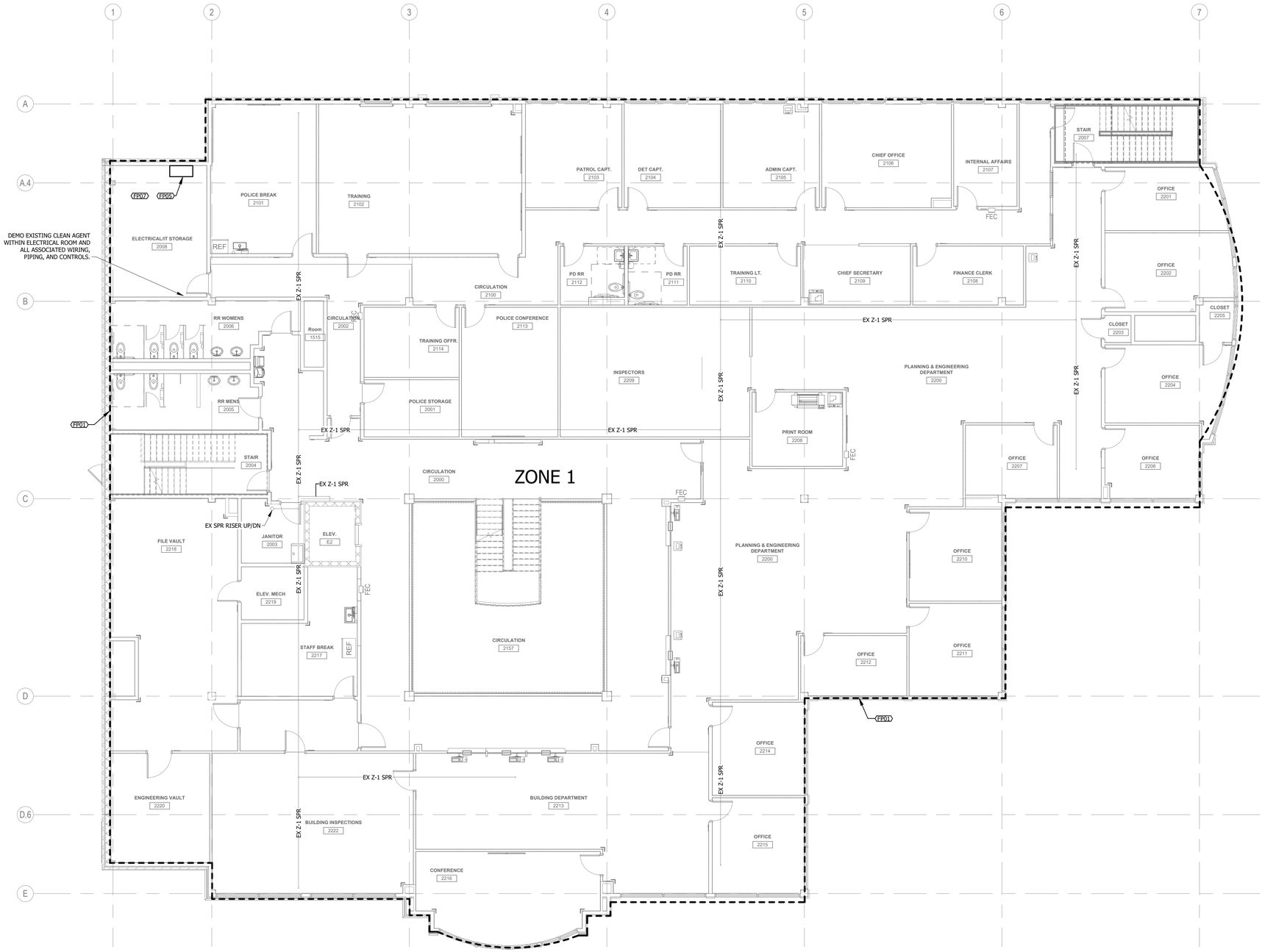

1 FIRE PROTECTION SECOND FLOOR
1/8" = 1'-0"

N

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. SPRINKLER SYSTEMS SHALL BE DESIGNED TO 100% COVERAGE BY NFPA-13 AND OTHER APPLICABLE CODES. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE ACTUAL NUMBER OF HEADS AND HEAD SPACING REQUIRED TO PROTECT THE AREA IN ACCORDANCE WITH NFPA REQUIREMENTS FOR THE APPROPRIATE HAZARD CLASSIFICATION. USE RETURN BENDS TO LOCATE SPRINKLER HEADS IN THE CENTER OF CEILING TILES.

B. THE DRAWINGS ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE ROUTING. CONTRACTOR SHALL FIELD ROUTE PIPING THROUGH THE (EXISTING) BUILDING TO AVOID INTERFERENCE'S WITH (EXISTING) STRUCTURE, EQUIPMENT, DUCTWORK, PIPING, LIGHTING, AND CONDUIT. CONCEAL PIPING WHERE POSSIBLE.

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E. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS ON OTHER SHEETS FOR ADDITIONAL INFORMATION ON CONSTRUCTION AND COORDINATION NEEDS OF OTHER TRADES.

F. COORDINATE SPRINKLER HEAD LOCATIONS WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO AVOID POSSIBLE CONFLICTS.

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M. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES AND CLERESTORY LOCATIONS.

REFERENCED NOTES

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FP05 PROVIDE NEW JANUS FK-5-1-12 NOVEC 1230, OR ENGINEER APPROVED EQUAL, CLEAN AGENT SYSTEM WITH POTTER DETECTION AND CONTROLS FOR ELECTRICAL ROOM. REFER TO DETAIL S/FPS.01 INCLUDE AGENT CYLINDERS, DISTRIBUTION PIPING, DISCHARGE NOZZLES, DETECTION, RELEASING CONTROLS, MANUAL RELEASE, ABORT STATION, PRESSURE RELIEF, AND ALL REQUIRED FIRE ALARM AND HVAC INTERLOCKS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

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SPRINKLER SECOND FLOOR PLAN

SHEET:
FP1.02

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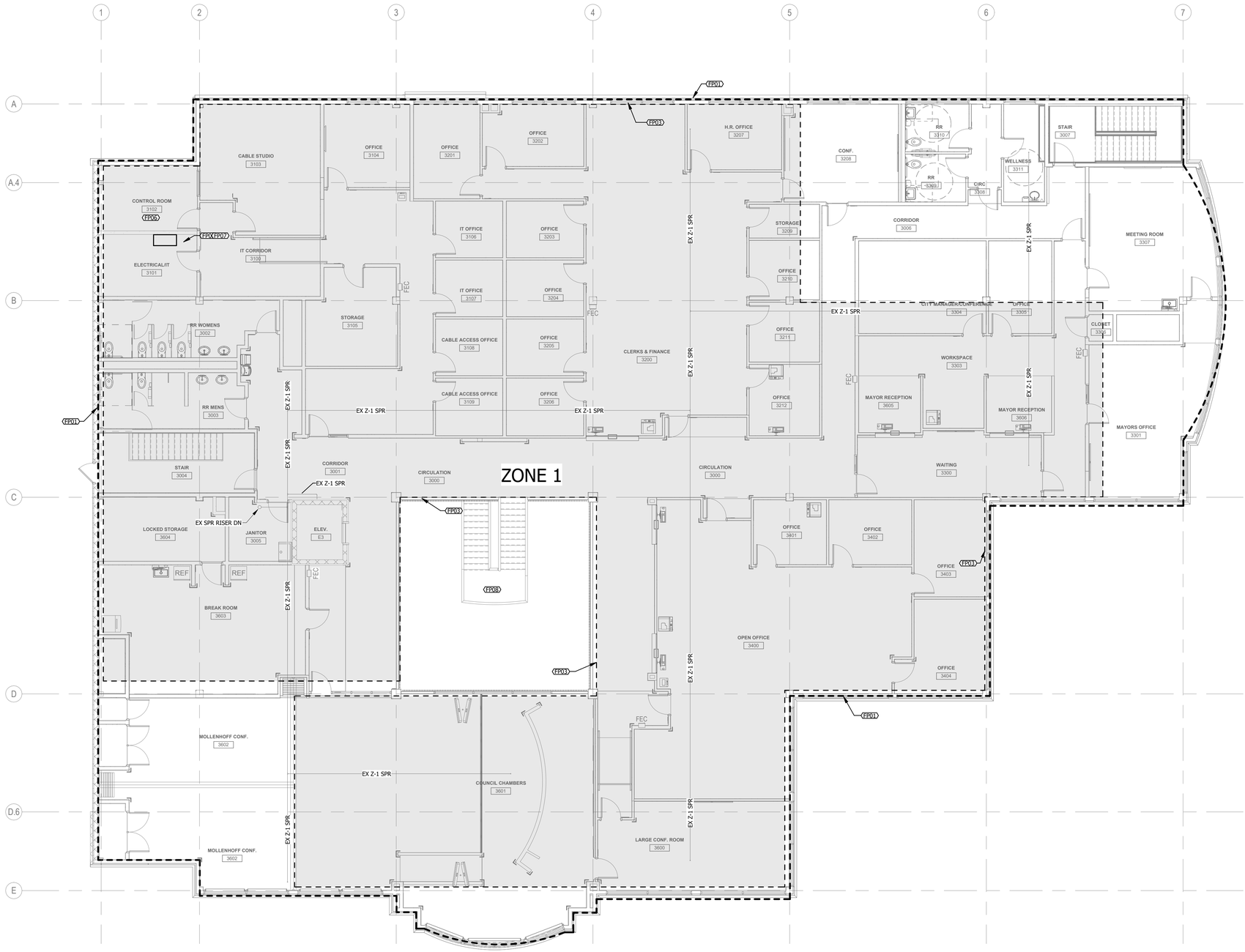

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E. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS ON OTHER SHEETS FOR ADDITIONAL INFORMATION ON CONSTRUCTION AND COORDINATION NEEDS OF OTHER TRADES.

F. COORDINATE SPRINKLER HEAD LOCATIONS WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO AVOID POSSIBLE CONFLICTS.

G. SPRINKLER CONTRACTOR SHALL USE CONCEALED HEADS IN ALL FINISHED SPACES AND EXPOSED HEADS IN OPEN CEILING SPACES. REFER TO SPECIFICATIONS FOR SECURITY CAGE LOCATIONS.

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REFERENCED NOTES

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FP03 REMOVE AND REINSTALL SPR PIPING MAINS, BRANCH PIPING, AND SPR HEADS AS REQUIRED FOR NEW STRUCTURAL REINFORCEMENT WORK. COORDINATE WITH STRUCTURAL DRAWINGS.

FP05 PROVIDE NEW JANUS FK-5-1-12 NOVEC 1230, OR ENGINEER APPROVED EQUAL, CLEAN AGENT SYSTEM WITH POTTER DETECTION AND CONTROLS FOR ELECTRICAL ROOM. REFER TO DETAIL S/FPS.01 INCLUDE AGENT CYLINDERS, DISTRIBUTION PIPING, DISCHARGE NOZZLES, DETECTION, RELEASING CONTROLS, MANUAL RELEASE, ABORT STATION, PRESSURE RELIEF, AND ALL REQUIRED FIRE ALARM AND HVAC INTERLOCKS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

FP06 DO NOT ROUTE ANY SPRINKLER PIPING THROUGH AV/DATA/ELECTRICAL ROOMS. ALL SPRINKLER HEADS SHALL BE SIDEWALL HEADS. DO NOT PLACE DIRECTLY ABOVE EQUIPMENT.

FP07 PROVIDE ALL REQUIRED SMOKE DETECTION, CONDUIT, WIRING AND ACCESSORIES FOR POWER AND CONTROL FOR A COMPLETE WORKING FIRE SUPPRESSION SYSTEM. COORDINATE WORK WITH THE ELECTRICAL CONTRACTOR AND ALL TRADES. CONNECT TO FIRE ALARM CONTROL PANEL. ALL COSTS ASSOCIATED WITH THE ABOVE MENTIONED WORK SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.

FP08 REPLACE EXISTING SPRINKLER HEADS AT TOP OF ATRIUM AS REQUIRED.

1 FIRE PROTECTION THIRD FLOOR
1/8" = 1'-0"

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SHEET NAME: SPRINKLER THIRD FLOOR PLAN

SHEET: FP1.03

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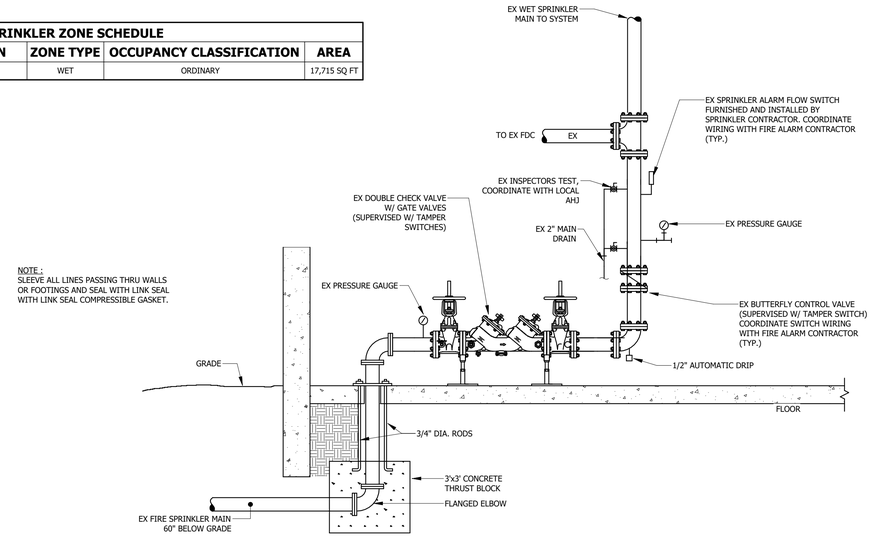
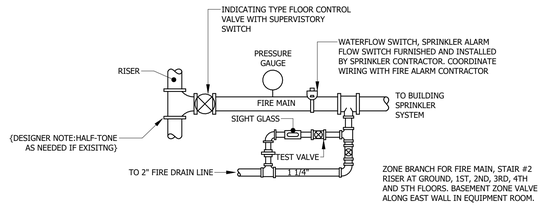
SPRINKLER ZONE SCHEDULE				
ZONE NUMBER	ZONE DESCRIPTION	ZONE TYPE	OCCUPANCY CLASSIFICATION	AREA
1	SEE FIRE PROTECTION PLANS	WET	ORDINARY	17,715 SQ FT

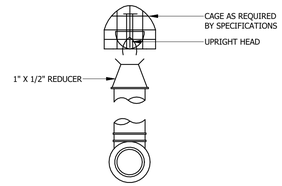


1 EX FIRE SPRINKLER ENTRANCE DETAIL
No Scale

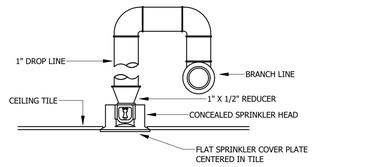




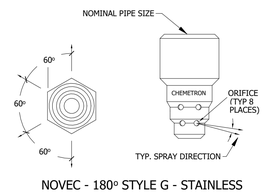
2 SPRINKLER RISER TAKEOFF DETAIL
No Scale



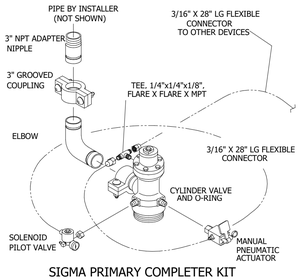
3 UPRIGHT SPRINKLER HEAD DETAIL
No Scale



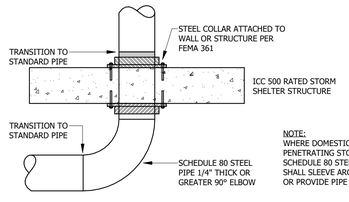
4 CONCEALED SPRINKLER HEAD DETAIL
No Scale



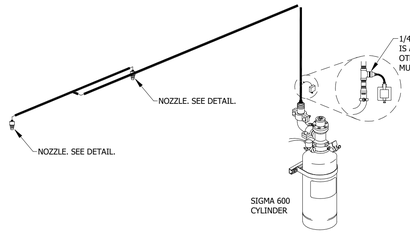
NOVEC - 180° STYLE G - STAINLESS



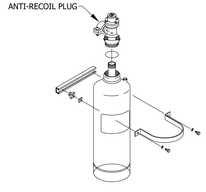
SIGMA PRIMARY COMPLETER KIT



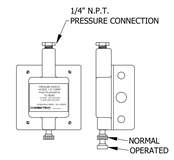
6 STORM SHELTER PIPE PENETRATION DETAIL - FIELD FABRICATED - FIRE PROTECTION
No Scale



CLEAN AGENT PIPING DETAIL



NOVEC SIGMA CYLINDER DETAIL



2-POLE PRESSURE SWITCH

5 CLEAN AGENT DETAIL
No Scale

NOTE:
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DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SPRINKLER DETAILS AND SCHEDULES

SHEET:
FP5.01

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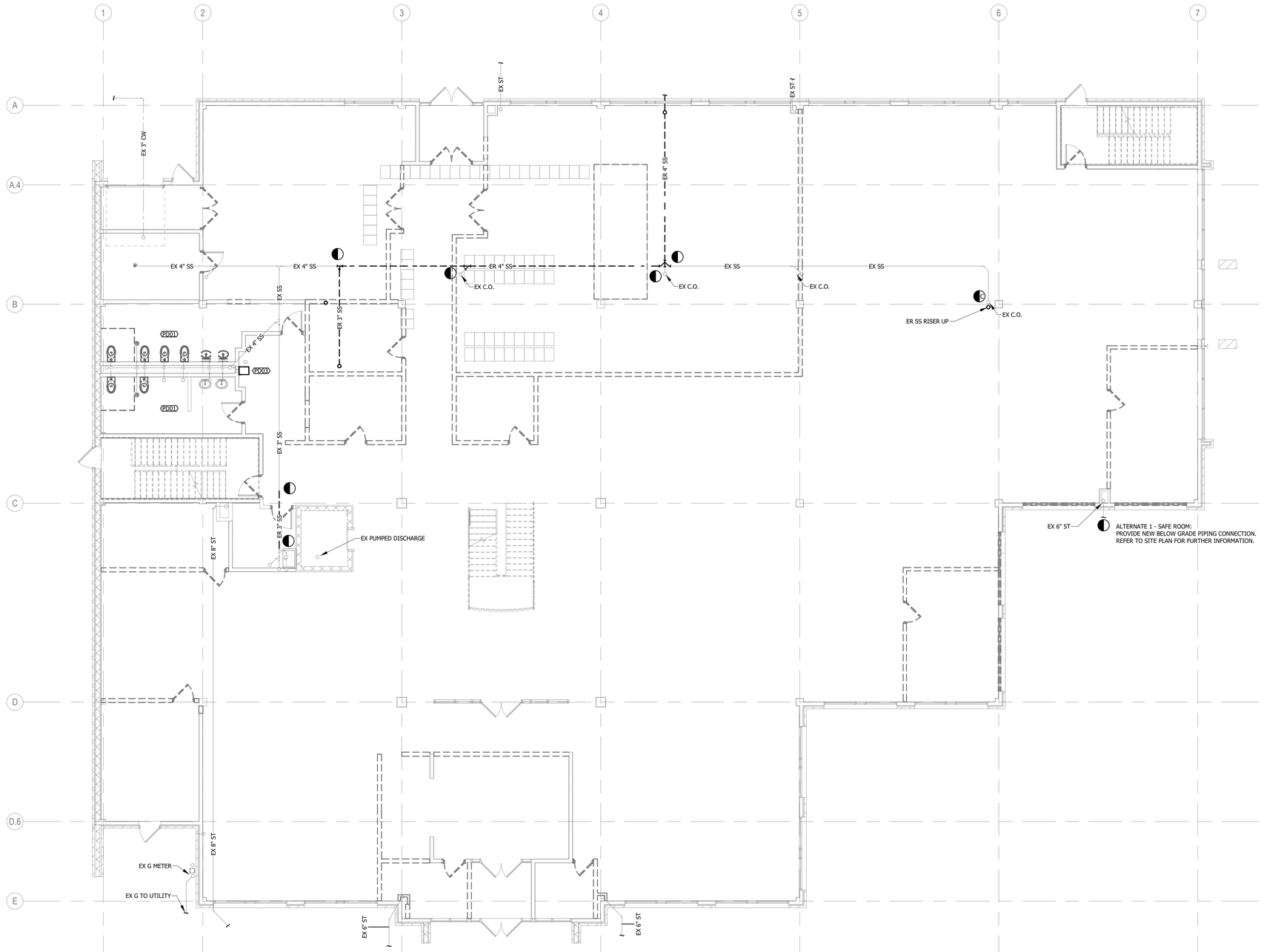

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL PLUMBING EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING PLUMBING SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

PD01 ALL FIXTURES TO BE DEMOLISHED, PREPARE AND REUSE CONNECTIONS FOR NEW FIXTURES/FLUSH VALVES.REFER TO NEW PLANS FOR FIXTURE TAGS. EXISTING TOILET PARTITIONS ARE TO REMAIN, CONTRACTOR TO PROTECT PARTITIONS DURING REPLACEMENT OF PLUMBING FIXTURES. PROTECT ALL WALL FINISHES, INCLUDING TILE, DURING DEMOLITION AND INSTALLATION OF NEW FIXTURES.

PD03 DEMO EXISTING PLUMBING FIXTURE. PREPARE DOMESTIC WATER, SANITARY AND VENT PIPING FOR RECONNECTION TO NEW FIXTURE. REFER TO NEW PLANS FOR FURTHER DETAILS.

1 PLUMBING DEMOLITION UNDERFLOOR
1/8" = 1'-0"

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
UNDERFLOOR PLUMBING DEMOLITION PLAN

SHEET:
PD1.01

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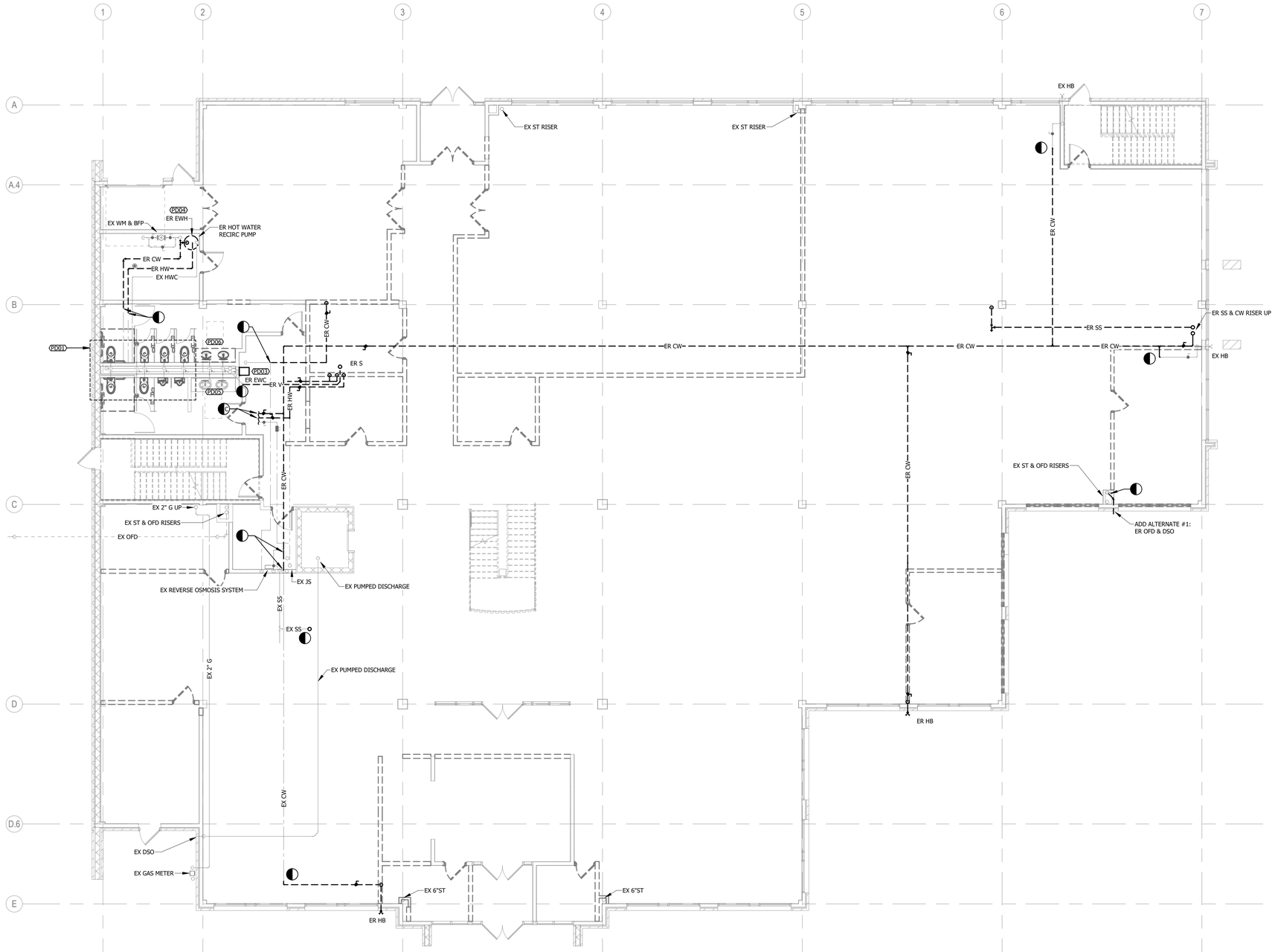

1 PLUMBING DEMOLITION FIRST FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL PLUMBING EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING PLUMBING SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

PD01 ALL FIXTURES TO BE DEMOLISHED, PREPARE AND REUSE CONNECTIONS FOR NEW FIXTURES/FLUSH VALVES.REFER TO NEW PLANS FOR FIXTURE TAGS. EXISTING TOILET PARTITIONS ARE TO REMAIN, CONTRACTOR TO PROTECT PARTITIONS DURING REPLACEMENT OF PLUMBING FIXTURES. PROTECT ALL WALL FINISHES, INCLUDING TILE, DURING DEMOLITION AND INSTALLATION OF NEW FIXTURES.

PD03 DEMO EXISTING PLUMBING FIXTURE. PREPARE DOMESTIC WATER, SANITARY AND VENT PIPING FOR RECONNECTION TO NEW FIXTURE. REFER TO NEW PLANS FOR FURTHER DETAILS.

PD04 DEMO WATER HEATER AND ALL ASSOCIATED PIPING, WIRING AND CONTROLS.

PD05 INTEGRAL LAV AND COUNTERTOP TO REMAIN. NEW FAUCET TO BE PROVIDED FOR INTGERAL SINKS. REFER TO NEW PLUMBING FLOOR PLANS FOR UPDATED FIXTURE TAGS.

PD06 INTEGRAL LAV AND COUNTER TO BE DEMOLISHED. REFER TO ARCHITECT PLANS FOR NEW INTEGRAL LAV INFORMATION. REFER TO NEW PLUMBING FLOOR PLANS FOR UPDATED FIXTURE TAGS.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR PLUMBING DEMOLITION PLAN

SHEET:
PD1.11

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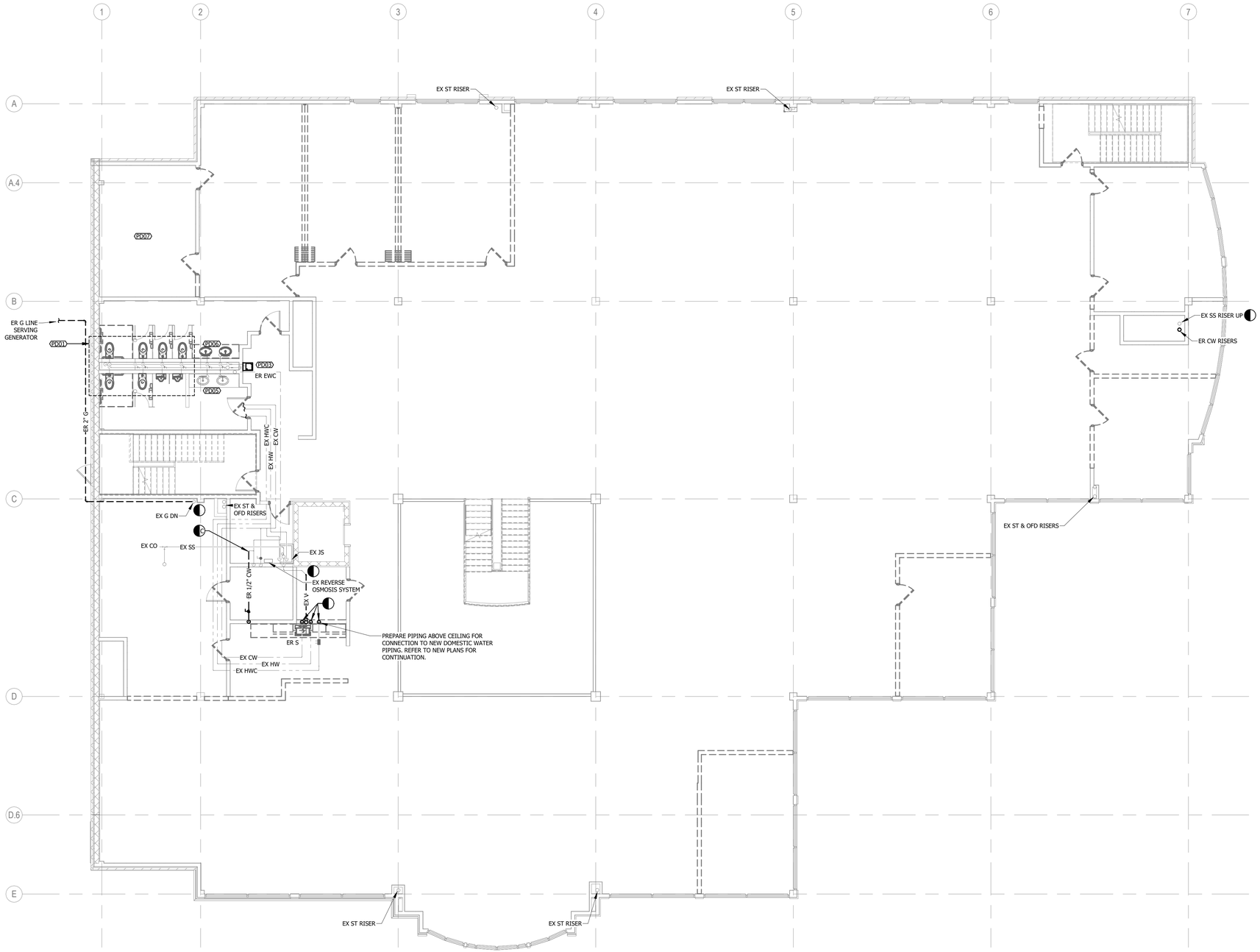

1 PLUMBING DEMOLITION SECOND FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL PLUMBING EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING PLUMBING SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

PD01 ALL FIXTURES TO BE DEMOLISHED, PREPARE AND REUSE CONNECTIONS FOR NEW FIXTURES/FLUSH VALVES.REFER TO NEW PLANS FOR FIXTURE TAGS. EXISTING TOILET PARTITIONS ARE TO REMAIN, CONTRACTOR TO PROTECT PARTITIONS DURING REPLACEMENT OF PLUMBING FIXTURES. PROTECT ALL WALL FINISHES, INCLUDING TILE, DURING DEMOLITION AND INSTALLATION OF NEW FIXTURES.

PD03 DEMO EXISTING PLUMBING FIXTURE. PREPARE DOMESTIC WATER, SANITARY AND VENT PIPING FOR RECONNECTION TO NEW FIXTURE. REFER TO NEW PLANS FOR FURTHER DETAILS.

PD05 INTEGRAL LAV AND COUNTERTOP TO REMAIN. NEW FAUCET TO BE PROVIDED FOR INTGERAL SINKS. REFER TO NEW PLUMBING FLOOR PLANS FOR UPDATED FIXTURE TAGS.

PD06 INTEGRAL LAV AND COUNTER TO BE DEMOLISHED. REFER TO ARCHITECT PLANS FOR NEW INTEGRAL LAV INFORMATION. REFER TO NEW PLUMBING FLOOR PLANS FOR UPDATED FIXTURE TAGS.

PD07 REMOVE EXISTING FIRE SUPPRESSION CLEAN AGENT SYSTEM, CONTROLS, WIRING, AND ACCESSORIES.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR PLUMBING DEMOLITION PLAN

SHEET:
PD1.12

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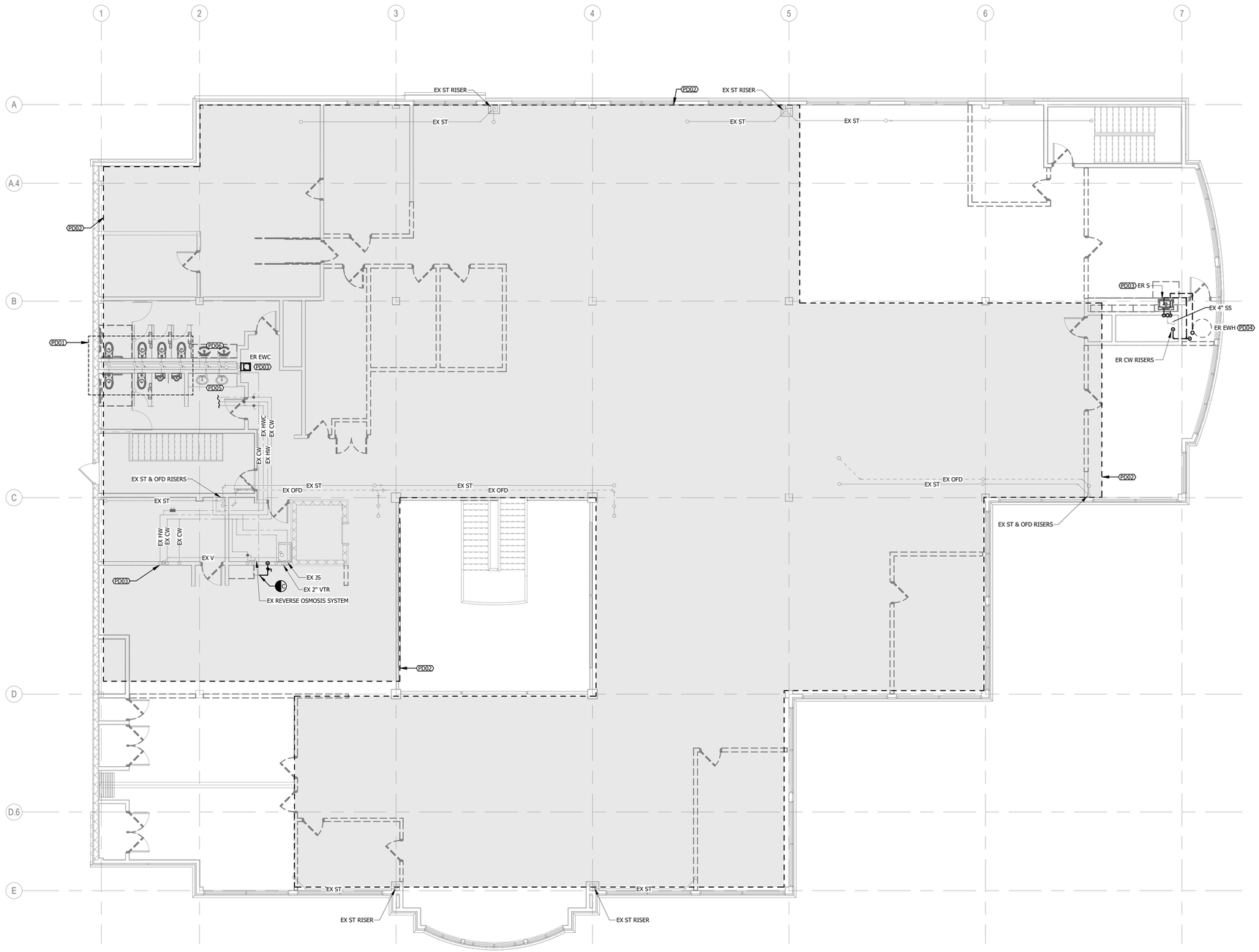

1 PLUMBING DEMOLITION THIRD FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL PLUMBING EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING PLUMBING SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

PD01 ALL FIXTURES TO BE DEMOLISHED, PREPARE AND REUSE CONNECTIONS FOR NEW FIXTURES/FLUSH VALVES.REFER TO NEW PLANS FOR FIXTURE TAGS. EXISTING TOILET PARTITIONS ARE TO REMAIN, CONTRACTOR TO PROTECT PARTITIONS DURING REPLACEMENT OF PLUMBING FIXTURES. PROTECT ALL WALL FINISHES, INCLUDING TILE, DURING DEMOLITION AND INSTALLATION OF NEW FIXTURES.

PD02 EX PIPING TO BE REMOVED AND REPLACED OR TEMPORARILY MOVED AS REQUIRED FOR NEW STRUCTURAL REINFORCEMENT WORK. COORDINATE WITH STRUCTURAL DRAWINGS.

PD03 DEMO EXISTING PLUMBING FIXTURE. PREPARE DOMESTIC WATER, SANITARY AND VENT PIPING FOR RECONNECTION TO NEW FIXTURE. REFER TO NEW PLANS FOR FURTHER DETAILS.

PD04 DEMO WATER HEATER AND ALL ASSOCIATED PIPING, WIRING AND CONTROLS.

PD05 INTEGRAL LAV AND COUNTERTOP TO REMAIN. NEW FAUCET TO BE PROVIDED FOR INTGERAL SINKS. REFER TO NEW PLUMBING FLOOR PLANS FOR UPDATED FIXTURE TAGS.

PD06 INTEGRAL LAV AND COUNTER TO BE DEMOLISHED. REFER TO ARCHITECT PLANS FOR NEW INTEGRAL LAV INFORMATION. REFER TO NEW PLUMBING FLOOR PLANS FOR UPDATED FIXTURE TAGS.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR PLUMBING DEMOLITION PLAN

SHEET:
PD1.13

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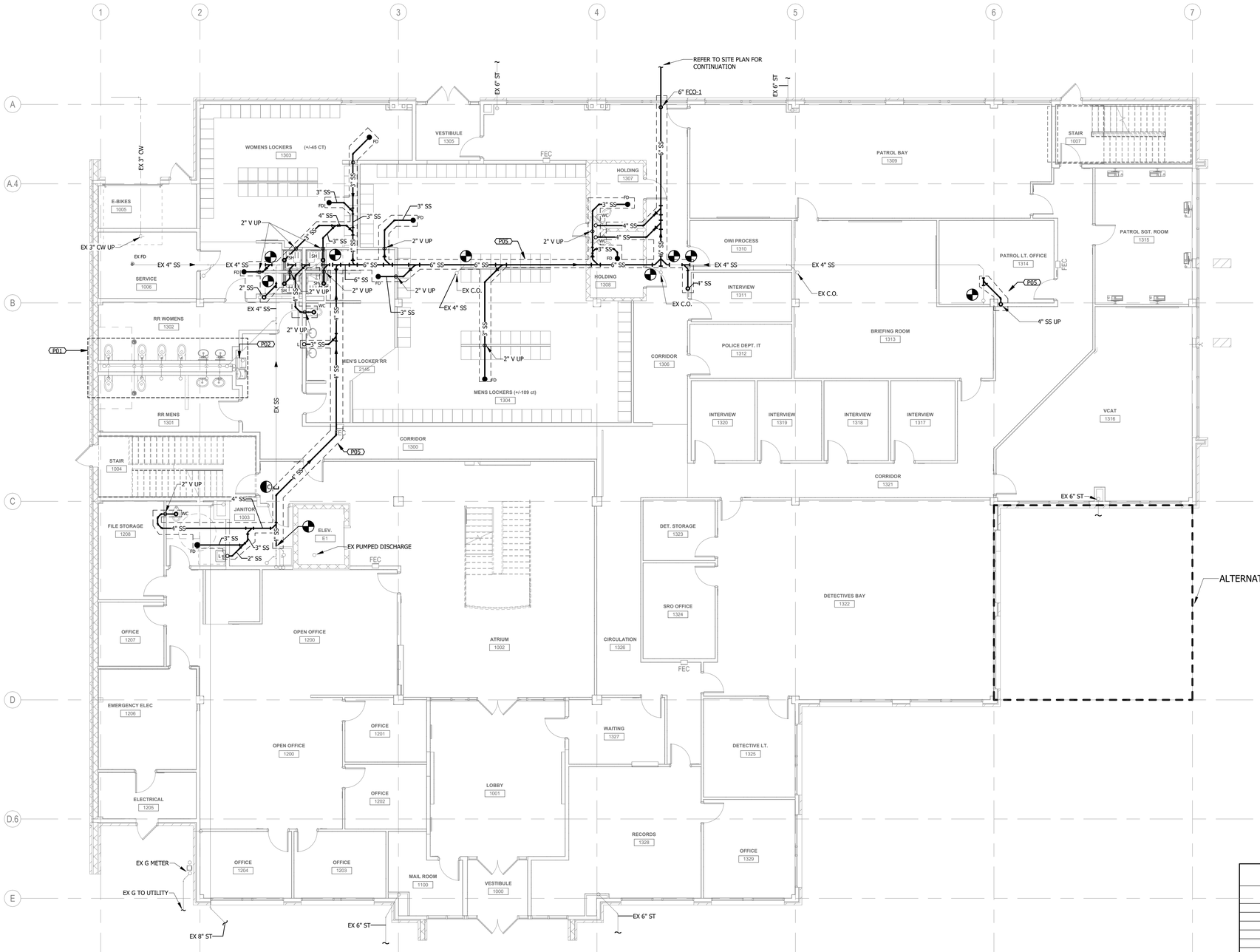

1 PLUMBING FIRST FLOOR UNDERFLOOR PLAN
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. INSTALLATION PLANS ARE SCHEMATIC IN NATURE. CONTRACTOR TO VERIFY PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL EQUIPMENT AND ABOVE ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING IN CLEARANCE SPACE.

C. COORDINATE PIPING LAYOUT AND ELEVATIONS WITH FOOTINGS, FLOW LINES, LOCAL PLUMBING CODE AND THE SPECIFICATIONS.

D. VERIFY ALL SITE CONDITIONS PRIOR TO START OF WORK.

E. COORDINATE ALL PLUMBING AND PIPING ROUTING WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO ALLOW FOR PROPER CLEARANCES AND FLOW REQUIREMENTS.

F. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL WATER HAMMER ARRESTORS ON ALL GROUP BATHROOM COLD WATER PIPE LOCATIONS. PROVIDE WITH SHUT-OFF BALL VALVE. REFER TO SPECIFICATIONS.

G. ALL CONDENSATE DRAIN PIPING SHALL BE 3/4" COPPER WITH INSULATION UNLESS NOTED OTHERWISE.

H. COORDINATE ALL VENTS THROUGH ROOF WITH STRUCTURAL DRAWINGS AND MAINTAIN 10FT REQUIRED DISTANCE FROM MECHANICAL EQUIPMENT INTAKES. OFFSET PIPING AS NECESSARY.

I. ROUTE AS MUCH STORM PIPING AS HIGH IN JOIST SPACE AS POSSIBLE.

J. COORDINATE ALL EXPOSED PIPE ROUTING WITH DESIGN TEAM PRIOR TO ROUGH-IN. SPECIFIC RACKING REQUIREMENTS MAY BE REQUIRED.

K. COORDINATE ALL FLOOR DRAIN LOCATIONS WITH MECHANICAL EQUIPMENT AND RESPECTIVE TRADES PRIOR TO ROUGH-IN.

L. COORDINATE STORM AND SANITARY SEWER CONNECTIONS WITH STRUCTURAL DRAWINGS TO MAINTAIN REQUIRED SLOPING AND PROPER ELEVATIONS.

M. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR FIXTURE CONNECTION SIZES.

N. FIELD VERIFY ALL NEW AND EXISTING PIPE ROUTING WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN. MAKE NECESSARY OFFSETS AS REQUIRED.

O. COORDINATE ALL WALL CLEANOUT LOCATIONS WITH DESIGN TEAM PRIOR TO ROUGH-IN. COORDINATE ALL FLOOR CLEANOUT LOCATIONS BEING INSTALLED IN TILE, TERRAZZO OR OTHER SPECIALTY FLOOR AREAS WITH DESIGN TEAM PRIOR TO ROUGH-IN.

P. PROVIDE ISOLATION BALL VALVES ON BRANCH PIPING TAPS FROM MAIN ON ALL COLD AND HOT WATER PIPES. ENSURE VALVES ARE INSTALLED IN ACCESSIBLE LOCATIONS.

Q. PROVIDE REFRIGERATOR VALVE BOX (VB-1) AT ALL REFRIGERATORS. CONNECT DOMESTIC WATER FROM NEAREST COLD WATER BRANCH SERVING THE SPACE.

REFERENCED NOTES

P01 PLUMBING FIXTURES TO BE REPLACED WITH NEW. MODIFY EX PLUMBING CONNECTION AS REQUIRED. EXISTING TOILET PARTITIONS ARE TO REMAIN, CONTRACTOR TO PROTECT PARTITIONS DURING REPLACEMENT OF PLUMBING FIXTURES. CONTRACTOR TO LIMIT WALL AND TILE WORK, FINISHES ARE TO REMAIN. NOTIFY DESIGN TEAM IF FINISH WORK IS REQUIRED.

P02 DEMO EXISTING DOMESTIC WATER BACK TO MAIN AND REPLACE WITH NEW PEX PIPING. INSTALL PER NEW DRINKING FOUNTAIN INSTALLATION INSTRUCTIONS. CONNECT TO EXISTING WASTE AND VENT.

P05 DASHED LINE REPRESENTS APPROXIMATE LOCATION OF FLOOR CUTTING/PATCHING REQUIRED FOR NEW UNDERGROUND PLUMBING WORK. EXTENT OF FLOOR CUTTING AND PATCHING MAY EXPAND BASED ON FIELD VERIFICATION OF EXISTING SANITARY SEWER LINES. CONTRACTOR SHALL BE AWARE OF EXISTING UNDERFLOOR ELECTRICAL DUCT RACEWAY BURIED IN CONCRETE FLOOR AND WORK AROUND AS MUCH AS POSSIBLE. SEAL OFF ANY UNDERFLOOR RACEWAY DISTURBED WHEN PATCHING FLOOR.

PLUMBING FIXTURE CONNECTION SCHEDULE

ITEM	WASTE SIZE	VENT SIZE	WATER SIZE	
			HOT	COLD
WATER CLOSET (FLUSH VALVE)	4"	2"	-	1-1/2"
URINAL	2"	1-1/2"	-	1"
LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
SINK	1-1/2"	1-1/2"	1/2"	1/2"
JANITOR SINK	3"	1-1/2"	3/4"	3/4"
DRINKING FOUNTAIN	1-1/2"	1-1/2"	-	1/2"
SHOWER	2"	1-1/2"	3/4"	3/4"

NOTES:
1. ALL SANITARY SEWER BELOW GRADE SHALL BE A MINIMUM OF 3" UNLESS OTHERWISE NOTED.
2. ALL VENT BELOW GRADE SHALL BE A MINIMUM OF 2" UNLESS OTHERWISE NOTED.
3. NOT ALL FIXTURES ON THIS SCHEDULE MAY BE USED.

NOTE:
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100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR UNDERFLOOR PLUMBING PLAN

SHEET:
P1.01

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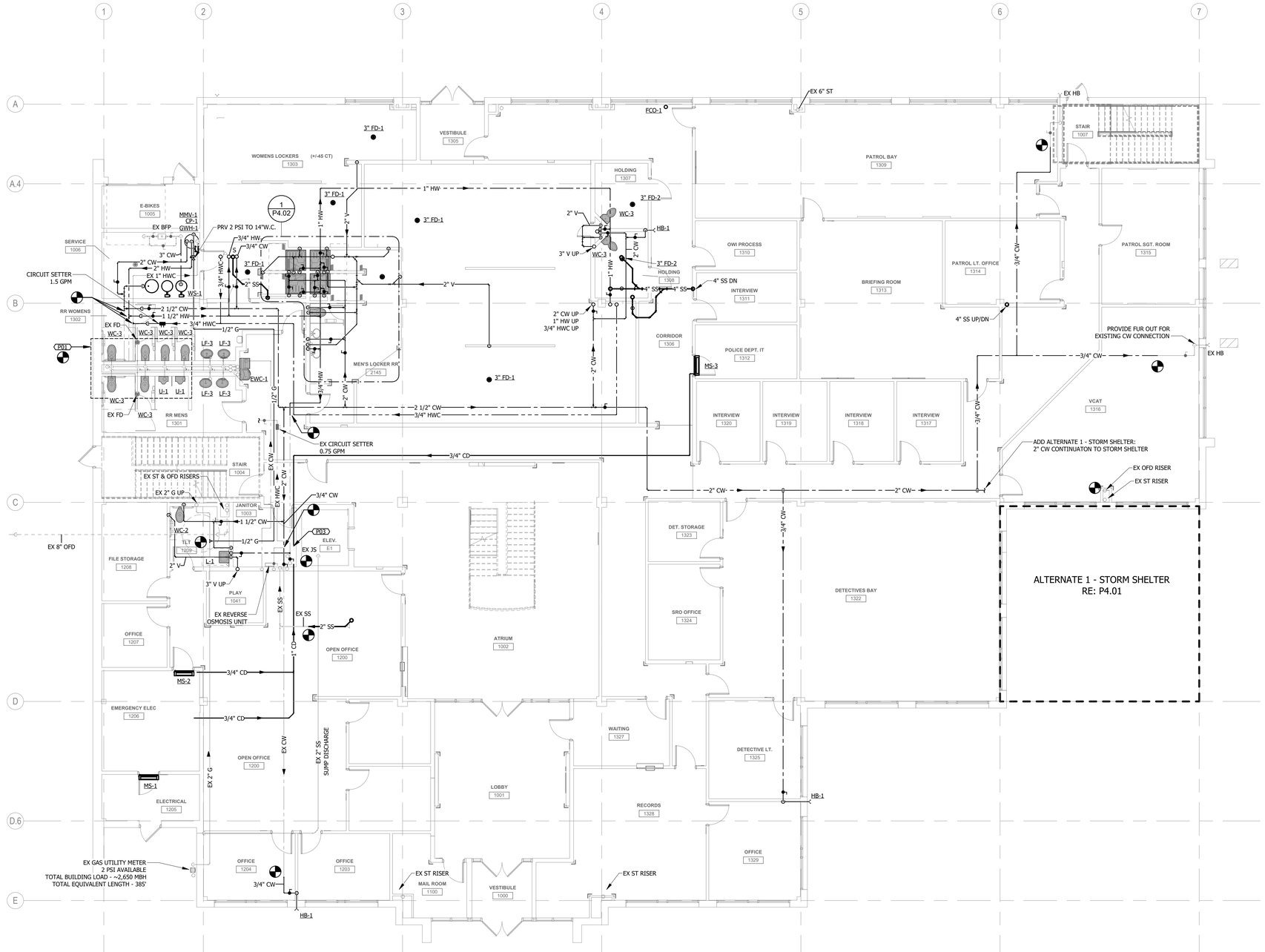

ALTERNATE 1 - STORM SHELTER
RE: P4.01

GENERAL NOTES:

A. INSTALLATION PLANS ARE SCHEMATIC IN NATURE. CONTRACTOR TO VERIFY PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL EQUIPMENT AND ABOVE ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING IN CLEARANCE SPACE.

C. COORDINATE PIPING LAYOUT AND ELEVATIONS WITH FOOTINGS, FLOW LINES, LOCAL PLUMBING CODE AND THE SPECIFICATIONS.

D. VERIFY ALL SITE CONDITIONS PRIOR TO START OF WORK.

E. COORDINATE ALL PLUMBING AND PIPING ROUTING WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO ALLOW FOR PROPER CLEARANCES AND FLOW REQUIREMENTS.

F. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL WATER HAMMER ARRESTORS ON ALL GROUP BATHROOM COLD WATER PIPE LOCATIONS. PROVIDE WITH SHUT-OFF BALL VALVE. REFER TO SPECIFICATIONS.

G. ALL CONDENSATE DRAIN PIPING SHALL BE 3/4" COPPER WITH INSULATION UNLESS NOTED OTHERWISE.

H. COORDINATE ALL VENTS THROUGH ROOF WITH STRUCTURAL DRAWINGS AND MAINTAIN 10FT REQUIRED DISTANCE FROM MECHANICAL EQUIPMENT INTAKES. OFFSET PIPING AS NECESSARY.

I. ROUTE AS MUCH STORM PIPING AS HIGH IN JOIST SPACE AS POSSIBLE.

J. COORDINATE ALL EXPOSED PIPE ROUTING WITH DESIGN TEAM PRIOR TO ROUGH-IN. SPECIFIC RACKING REQUIREMENTS MAY BE REQUIRED.

K. COORDINATE ALL FLOOR DRAIN LOCATIONS WITH MECHANICAL EQUIPMENT AND RESPECTIVE TRADES PRIOR TO ROUGH-IN.

L. COORDINATE STORM AND SANITARY SEWER CONNECTIONS WITH STRUCTURAL DRAWINGS TO MAINTAIN REQUIRED SLOPING AND PROPER ELEVATIONS.

M. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR FIXTURE CONNECTION SIZES.

N. FIELD VERIFY ALL NEW AND EXISTING PIPE ROUTING WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN. MAKE NECESSARY OFFSETS AS REQUIRED.

O. COORDINATE ALL WALL CLEANOUT LOCATIONS WITH DESIGN TEAM PRIOR TO ROUGH-IN. COORDINATE ALL FLOOR CLEANOUT LOCATIONS BEING INSTALLED IN TILE, TERRAZZO OR OTHER SPECIALTY FLOOR AREAS WITH DESIGN TEAM PRIOR TO ROUGH-IN.

P. PROVIDE ISOLATION BALL VALVES ON BRANCH PIPING TAPS FROM MAIN ON ALL COLD AND HOT WATER PIPES. ENSURE VALVES ARE INSTALLED IN ACCESSIBLE LOCATIONS.

Q. PROVIDE REFRIGERATOR VALVE BOX (VB-1) AT ALL REFRIGERATORS. CONNECT DOMESTIC WATER FROM NEAREST COLD WATER BRANCH SERVING THE SPACE.

REFERENCED NOTES

P01 PLUMBING FIXTURES TO BE REPLACED WITH NEW. MODIFY EX PLUMBING CONNECTION AS REQUIRED. EXISTING TOILET PARTITIONS ARE TO REMAIN, CONTRACTOR TO PROTECT PARTITIONS DURING REPLACEMENT OF PLUMBING FIXTURES. CONTRACTOR TO LIMIT WALL AND TILE WORK, FINISHES ARE TO REMAIN. NOTIFY DESIGN TEAM IF FINISH WORK IS REQUIRED.

P03 CONDENSATE DRAIN TO TERMINATE AT JS WITH MINIMUM TWO PIPE DIAMETER AIR GAP.

PLUMBING FIXTURE CONNECTION SCHEDULE

ITEM	WASTE SIZE	VENT SIZE	WATER SIZE	
			HOT	COLD
WATER CLOSET (FLUSH VALVE)	4"	2"	-	1-1/2"
URINAL	2"	1-1/2"	-	1"
LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
SINK	1-1/2"	1-1/2"	1/2"	1/2"
JANITOR SINK	3"	1-1/2"	3/4"	3/4"
DRINKING FOUNTAIN	1-1/2"	1-1/2"	-	1/2"
SHOWER	2"	1-1/2"	3/4"	3/4"

NOTES:
1. ALL SANITARY SEWER BELOW GRADE SHALL BE A MINIMUM OF 3" UNLESS OTHERWISE NOTED.
2. ALL VENT BELOW GRADE SHALL BE A MINIMUM OF 2" UNLESS OTHERWISE NOTED.
3. NOT ALL FIXTURES ON THIS SCHEDULE MAY BE USED.

1 PLUMBING FIRST FLOOR
1/8" = 1'-0"

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR PLUMBING PLAN

SHEET:
P1.11

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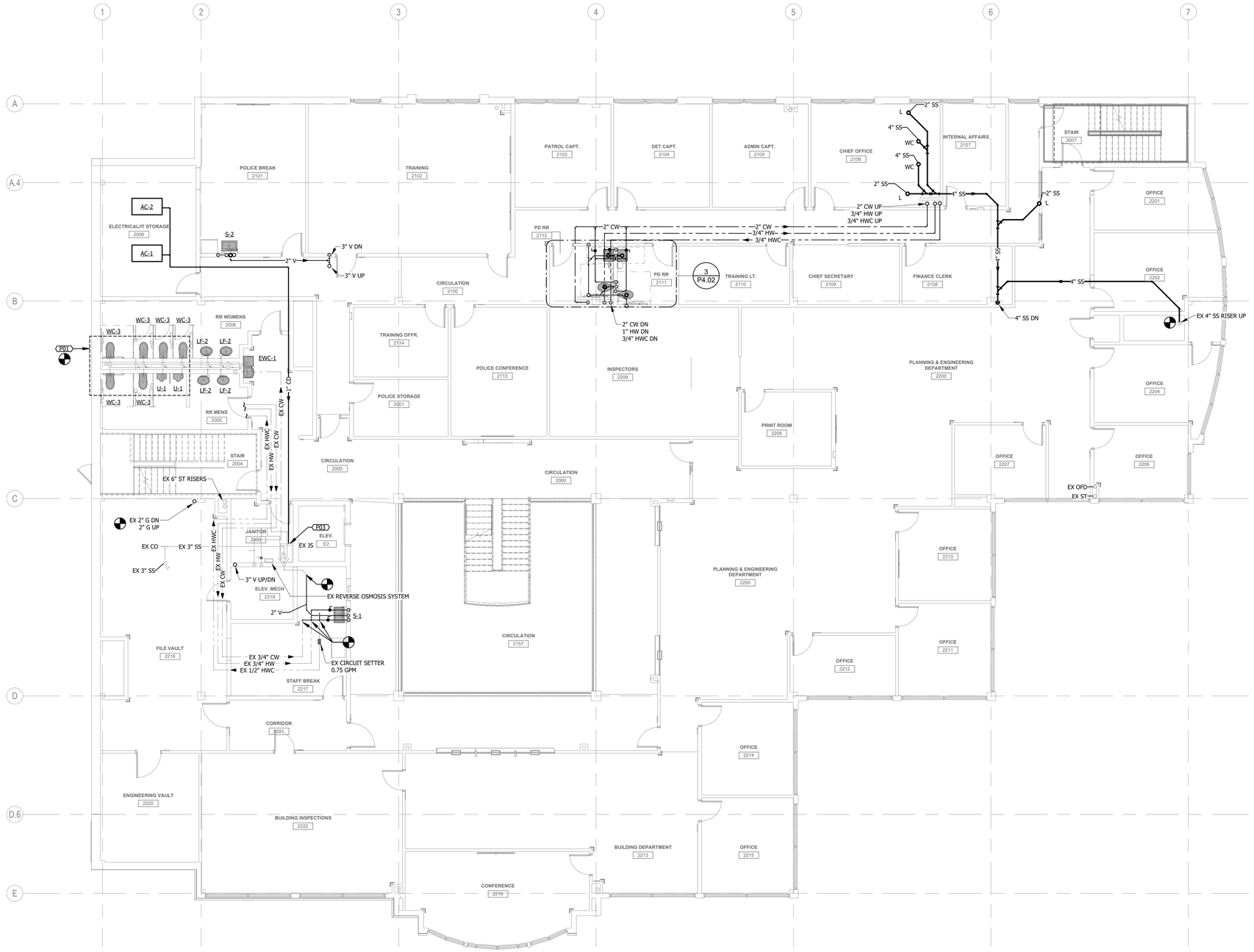

1 PLUMBING SECOND FLOOR
1/8" = 1'-0"

GENERAL NOTES:

A. INSTALLATION PLANS ARE SCHEMATIC IN NATURE. CONTRACTOR TO VERIFY PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL EQUIPMENT AND ABOVE ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING IN CLEARANCE SPACE.

C. COORDINATE PIPING LAYOUT AND ELEVATIONS WITH FOOTINGS, FLOW LINES, LOCAL PLUMBING CODE AND THE SPECIFICATIONS.

D. VERIFY ALL SITE CONDITIONS PRIOR TO START OF WORK.

E. COORDINATE ALL PLUMBING AND PIPING ROUTING WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO ALLOW FOR PROPER CLEARANCES AND FLOW REQUIREMENTS.

F. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL WATER HAMMER ARRESTORS ON ALL GROUP BATHROOM COLD WATER PIPE LOCATIONS. PROVIDE WITH SHUT-OFF BALL VALVE. REFER TO SPECIFICATIONS.

G. ALL CONDENSATE DRAIN PIPING SHALL BE 3/4" COPPER WITH INSULATION UNLESS NOTED OTHERWISE.

H. COORDINATE ALL VENTS THROUGH ROOF WITH STRUCTURAL DRAWINGS AND MAINTAIN 10FT REQUIRED DISTANCE FROM MECHANICAL EQUIPMENT INTAKES. OFFSET PIPING AS NECESSARY.

I. ROUTE AS MUCH STORM PIPING AS HIGH IN JOIST SPACE AS POSSIBLE.

J. COORDINATE ALL EXPOSED PIPE ROUTING WITH DESIGN TEAM PRIOR TO ROUGH-IN. SPECIFIC RACKING REQUIREMENTS MAY BE REQUIRED.

K. COORDINATE ALL FLOOR DRAIN LOCATIONS WITH MECHANICAL EQUIPMENT AND RESPECTIVE TRADES PRIOR TO ROUGH-IN.

L. COORDINATE STORM AND SANITARY SEWER CONNECTIONS WITH STRUCTURAL DRAWINGS TO MAINTAIN REQUIRED SLOPING AND PROPER ELEVATIONS.

M. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR FIXTURE CONNECTION SIZES.

N. FIELD VERIFY ALL NEW AND EXISTING PIPE ROUTING WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN. MAKE NECESSARY OFFSETS AS REQUIRED.

O. COORDINATE ALL WALL CLEANOUT LOCATIONS WITH DESIGN TEAM PRIOR TO ROUGH-IN. COORDINATE ALL FLOOR CLEANOUT LOCATIONS BEING INSTALLED IN TILE, TERRAZZO OR OTHER SPECIALTY FLOOR AREAS WITH DESIGN TEAM PRIOR TO ROUGH-IN.

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P03 CONDENSATE DRAIN TO TERMINATE AT JS WITH MINIMUM TWO PIPE DIAMETER AIR GAP.

PLUMBING FIXTURE CONNECTION SCHEDULE

ITEM	WASTE SIZE	VENT SIZE	WATER SIZE	
			HOT	COLD
WATER CLOSET (FLUSH VALVE)	4"	2"	-	1-1/2"
URINAL	2"	1-1/2"	-	1"
LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
SINK	1-1/2"	1-1/2"	1/2"	1/2"
JANITOR SINK	3"	1-1/2"	3/4"	3/4"
DRINKING FOUNTAIN	1-1/2"	1-1/2"	-	1/2"
SHOWER	2"	1-1/2"	3/4"	3/4"

NOTES:
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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR PLUMBING PLAN

SHEET:
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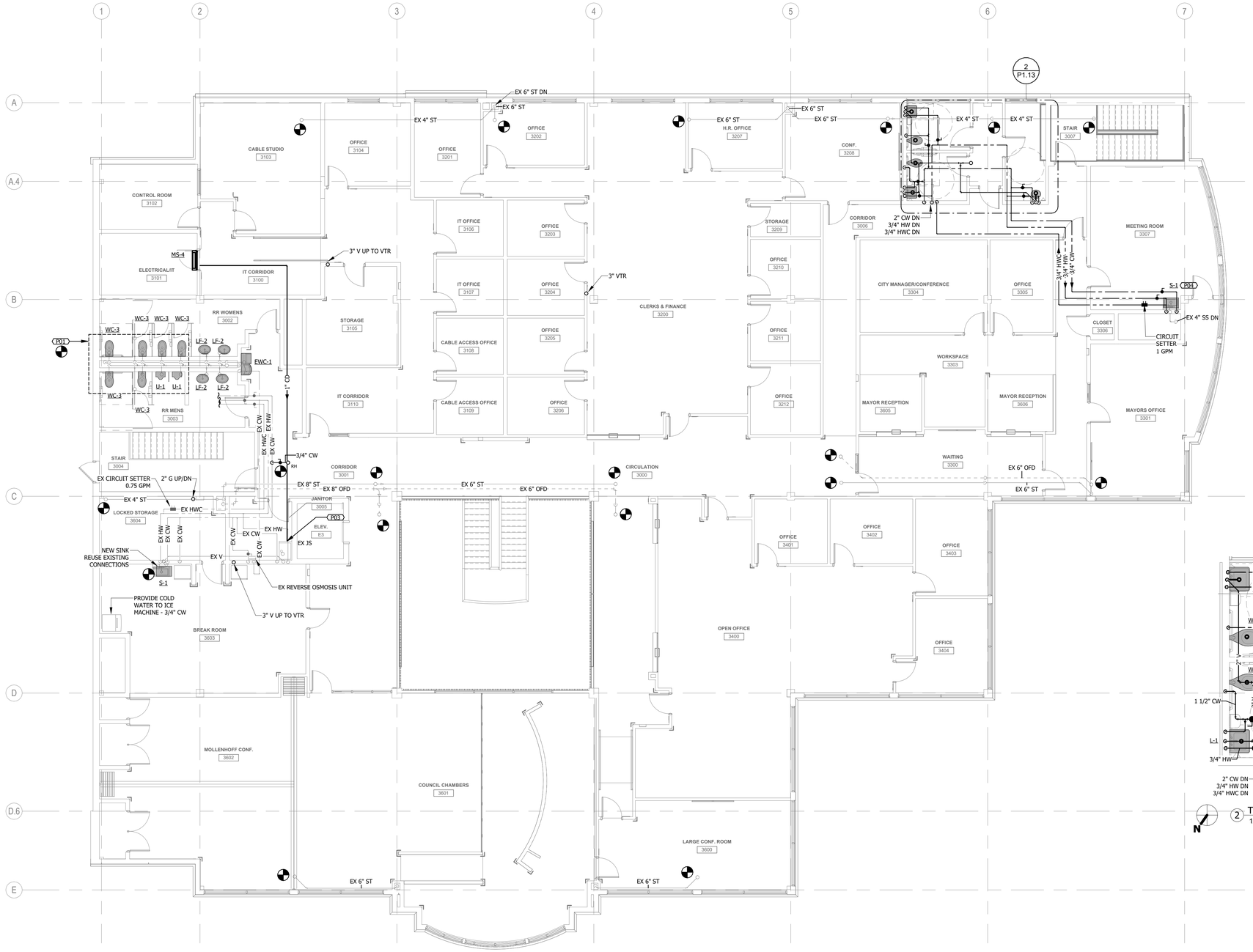
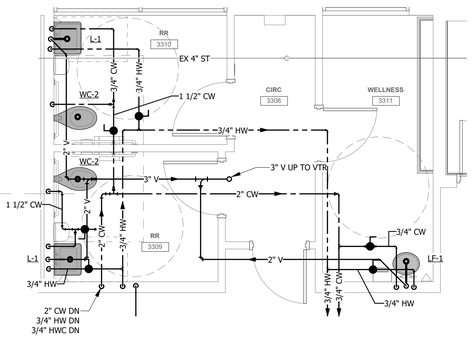


1 PLUMBING THIRD FLOOR
1/8" = 1'-0"



2 THIRD FLOOR RR PLUMBING ENLARGED PLAN
1/4" = 1'-0"

GENERAL NOTES:

A. INSTALLATION PLANS ARE SCHEMATIC IN NATURE. CONTRACTOR TO VERIFY PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

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C. COORDINATE PIPING LAYOUT AND ELEVATIONS WITH FOOTINGS, FLOW LINES, LOCAL PLUMBING CODE AND THE SPECIFICATIONS.

D. VERIFY ALL SITE CONDITIONS PRIOR TO START OF WORK.

E. COORDINATE ALL PLUMBING AND PIPING ROUTING WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO ALLOW FOR PROPER CLEARANCES AND FLOW REQUIREMENTS.

F. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL WATER HAMMER ARRESTORS ON ALL GROUP BATHROOM COLD WATER PIPE LOCATIONS. PROVIDE WITH SHUT-OFF BALL VALVE. REFER TO SPECIFICATIONS.

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H. COORDINATE ALL VENTS THROUGH ROOF WITH STRUCTURAL DRAWINGS AND MAINTAIN 10FT REQUIRED DISTANCE FROM MECHANICAL EQUIPMENT INTAKES. OFFSET PIPING AS NECESSARY.

I. ROUTE AS MUCH STORM PIPING AS HIGH IN JOIST SPACE AS POSSIBLE.

J. COORDINATE ALL EXPOSED PIPE ROUTING WITH DESIGN TEAM PRIOR TO ROUGH-IN. SPECIFIC RACKING REQUIREMENTS MAY BE REQUIRED.

K. COORDINATE ALL FLOOR DRAIN LOCATIONS WITH MECHANICAL EQUIPMENT AND RESPECTIVE TRADES PRIOR TO ROUGH-IN.

L. COORDINATE STORM AND SANITARY SEWER CONNECTIONS WITH STRUCTURAL DRAWINGS TO MAINTAIN REQUIRED SLOPING AND PROPER ELEVATIONS.

M. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR FIXTURE CONNECTION SIZES.

N. FIELD VERIFY ALL NEW AND EXISTING PIPE ROUTING WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN. MAKE NECESSARY OFFSETS AS REQUIRED.

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REFERENCED NOTES

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P03 CONDENSATE DRAIN TO TERMINATE AT JS WITH MINIMUM TWO PIPE DIAMETER AIR GAP.

P04 CONNECT NEW FIXTURE TO EXISTING SANITARY SEWER AND VENT PIPING. PROVIDE FIXTURE WITH NEW DOMESTIC COLD WATER AND HOT WATER CONNECTIONS AS SHOWN ON PLAN. MODIFY/EXTEND PIPING AS REQUIRED.

PLUMBING FIXTURE CONNECTION SCHEDULE

ITEM	WASTE SIZE	VENT SIZE	WATER SIZE	
			HOT	COLD
WATER CLOSET (FLUSH VALVE)	4"	2"	-	1-1/2"
URINAL	2"	1-1/2"	-	1"
LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
SINK	1-1/2"	1-1/2"	1/2"	1/2"
JANITOR SINK	3"	1-1/2"	3/4"	3/4"
DRINKING FOUNTAIN	1-1/2"	1-1/2"	-	1/2"
SHOWER	2"	1-1/2"	3/4"	3/4"

NOTES:
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3. NOT ALL FIXTURES ON THIS SCHEDULE MAY BE USED.

NOTE:
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REVISIONS:

No.	Description	Date

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: THIRD FLOOR PLUMBING PLAN

SHEET: P1.13

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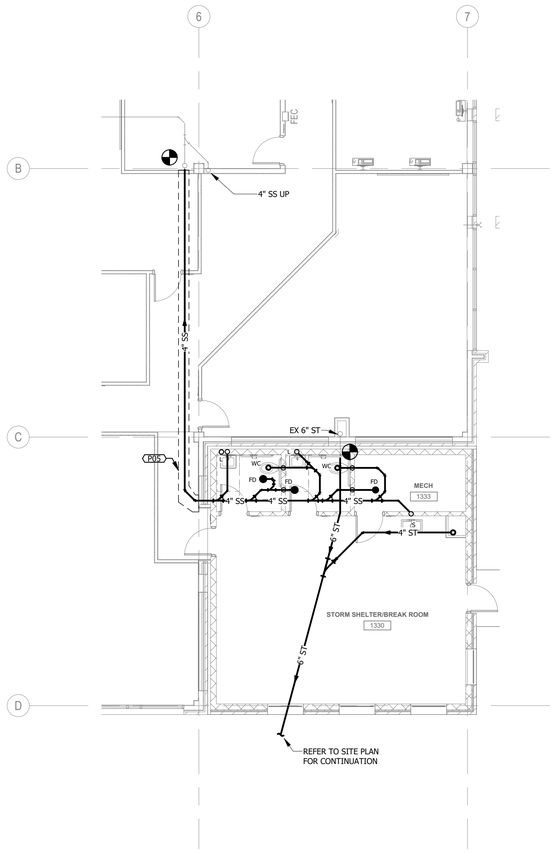
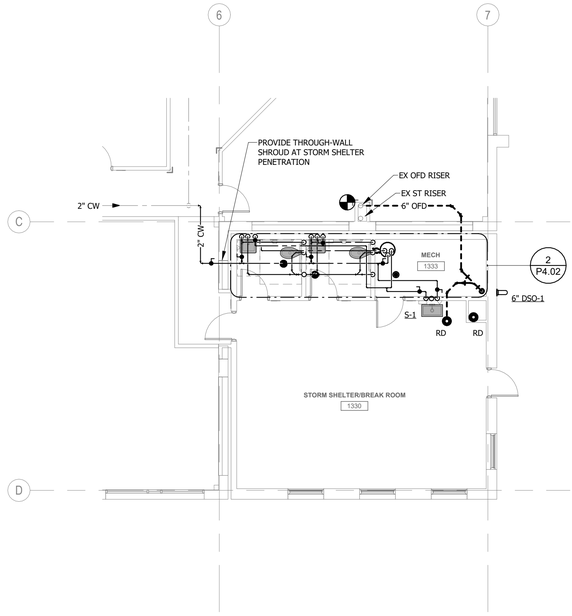


1 PLUMBING FIRST FLOOR UNDERFLOOR PLAN - ALTERNATE 1
1/8" = 1'-0"



2 PLUMBING FIRST FLOOR - ALTERNATE 1
1/8" = 1'-0"

GENERAL NOTES:

A. INSTALLATION PLANS ARE SCHEMATIC IN NATURE. CONTRACTOR TO VERIFY PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL EQUIPMENT AND ABOVE ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING IN CLEARANCE SPACE.

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D. VERIFY ALL SITE CONDITIONS PRIOR TO START OF WORK.

E. COORDINATE ALL PLUMBING AND PIPING ROUTING WITH BUILDING STRUCTURE AND OTHER TRADES PRIOR TO INSTALLATION TO ALLOW FOR PROPER CLEARANCES AND FLOW REQUIREMENTS.

F. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL WATER HAMMER ARRESTORS ON ALL GROUP BATHROOM COLD WATER PIPE LOCATIONS. PROVIDE WITH SHUT-OFF BALL VALVE. REFER TO SPECIFICATIONS.

G. ALL CONDENSATE DRAIN PIPING SHALL BE 3/4" COPPER WITH INSULATION UNLESS NOTED OTHERWISE.

H. COORDINATE ALL VENTS THROUGH ROOF WITH STRUCTURAL DRAWINGS AND MAINTAIN 10FT REQUIRED DISTANCE FROM MECHANICAL EQUIPMENT INTAKES. OFFSET PIPING AS NECESSARY.

I. ROUTE AS MUCH STORM PIPING AS HIGH IN JOIST SPACE AS POSSIBLE.

J. COORDINATE ALL EXPOSED PIPE ROUTING WITH DESIGN TEAM PRIOR TO ROUGH-IN. SPECIFIC RACKING REQUIREMENTS MAY BE REQUIRED.

K. COORDINATE ALL FLOOR DRAIN LOCATIONS WITH MECHANICAL EQUIPMENT AND RESPECTIVE TRADES PRIOR TO ROUGH-IN.

L. COORDINATE STORM AND SANITARY SEWER CONNECTIONS WITH STRUCTURAL DRAWINGS TO MAINTAIN REQUIRED SLOPING AND PROPER ELEVATIONS.

M. SEE PLUMBING FIXTURE CONNECTION SCHEDULE FOR FIXTURE CONNECTION SIZES.

N. FIELD VERIFY ALL NEW AND EXISTING PIPE ROUTING WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN. MAKE NECESSARY OFFSETS AS REQUIRED.

O. COORDINATE ALL WALL CLEANOUT LOCATIONS WITH DESIGN TEAM PRIOR TO ROUGH-IN. COORDINATE ALL FLOOR CLEANOUT LOCATIONS BEING INSTALLED IN TILE, TERRAZZO OR OTHER SPECIALTY FLOOR AREAS WITH DESIGN TEAM PRIOR TO ROUGH-IN.

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Q. PROVIDE REFRIGERATOR VALVE BOX (VB-1) AT ALL REFRIGERATORS. CONNECT DOMESTIC WATER FROM NEAREST COLD WATER BRANCH SERVING THE SPACE.

PLUMBING FIXTURE CONNECTION SCHEDULE

ITEM	WASTE SIZE	VENT SIZE	WATER SIZE	
			HOT	COLD
WATER CLOSET (FLUSH VALVE)	4"	2"	-	1-1/2"
URINAL	2"	1-1/2"	-	1"
LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"
SINK	1-1/2"	1-1/2"	1/2"	1/2"
JANITOR SINK	3"	1-1/2"	3/4"	3/4"
DRINKING FOUNTAIN	1-1/2"	1-1/2"	-	1/2"
SHOWER	2"	1-1/2"	3/4"	3/4"

NOTES:
1. ALL SANITARY SEWER BELOW GRADE SHALL BE A MINIMUM OF 3" UNLESS OTHERWISE NOTED.
2. ALL VENT BELOW GRADE SHALL BE A MINIMUM OF 2" UNLESS OTHERWISE NOTED.
3. NOT ALL FIXTURES ON THIS SCHEDULE MAY BE USED.

NOTE:
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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
PLUMBING ALTERNATE 1 PLANS

SHEET:
P4.01

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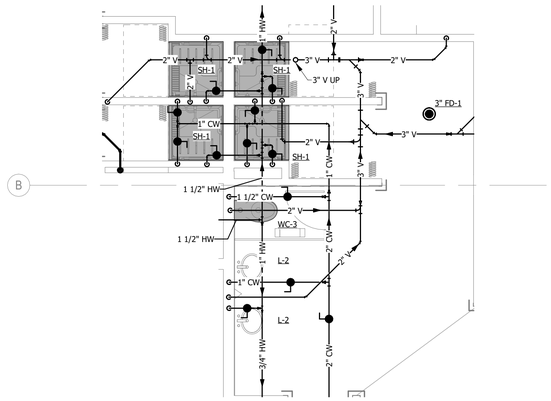
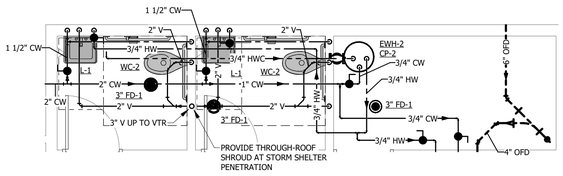
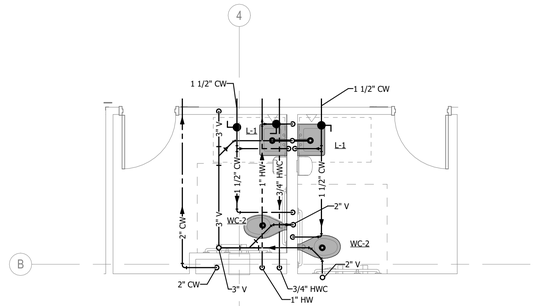


1 LOCKER ROOM PLUMBING ENLARGED PLAN
1/4" = 1'-0"



2 STORM SHELTER PLUMBING ENLARGED PLAN
1/4" = 1'-0"



3 SECOND FLOOR RR PLUMBING ENLARGED PLAN
1/4" = 1'-0"

GENERAL NOTES:

A. INSTALLATION PLANS ARE SCHEMATIC IN NATURE. CONTRACTOR TO VERIFY PLACEMENT OF NEW EQUIPMENT/FIXTURES PRIOR TO INSTALLATION.

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G. ALL CONDENSATE DRAIN PIPING SHALL BE 3/4" COPPER WITH INSULATION UNLESS NOTED OTHERWISE.

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N. FIELD VERIFY ALL NEW AND EXISTING PIPE ROUTING WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN. MAKE NECESSARY OFFSETS AS REQUIRED.

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SINK	1-1/2"	1-1/2"	1/2"	1/2"
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24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
PLUMBING ENLARGED PLANS

SHEET:
P4.02

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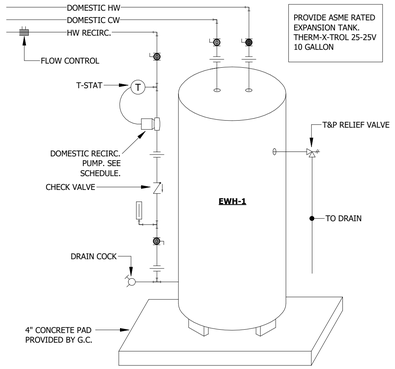
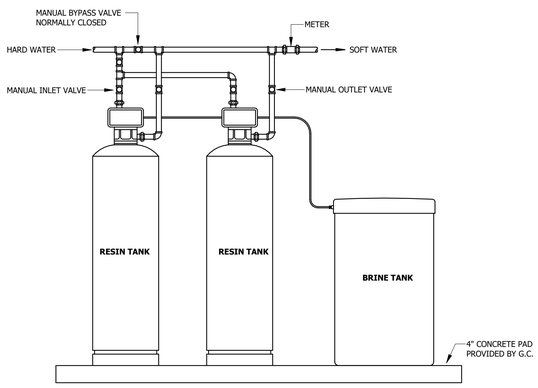


1 ELECTRIC WATER HEATER DETAIL
No Scale



8 ALTERNATING DUPLEX WATER SOFTENER DETAIL
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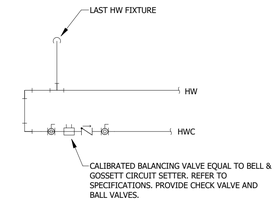
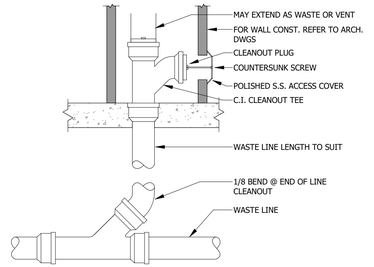
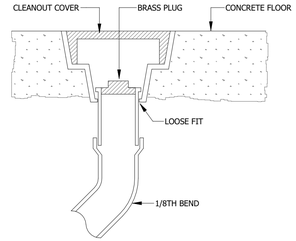


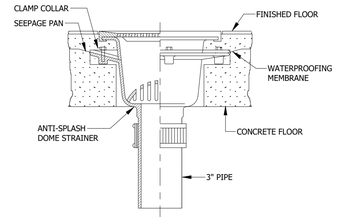
2 HWC PIPING DETAIL
No Scale



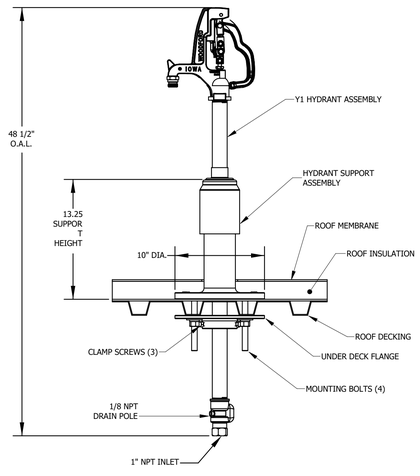
3 WALL CLEANOUT DETAIL
No Scale



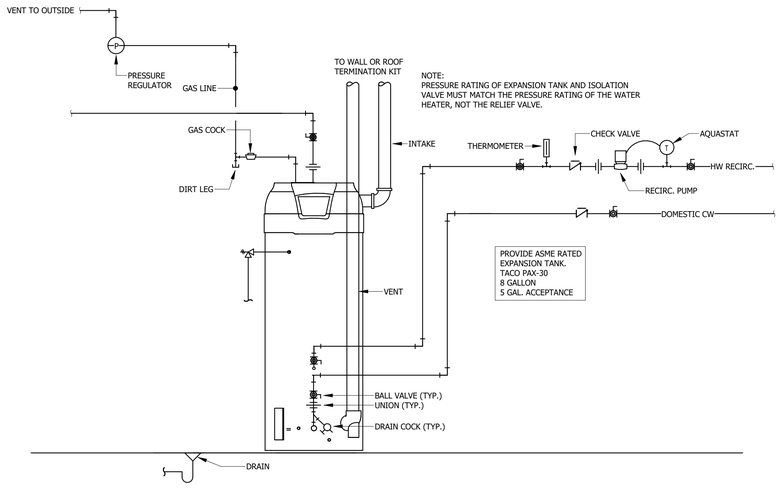
4 FLOOR CLEANOUT DETAIL
No Scale



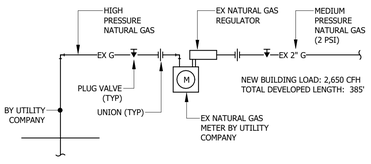
5 FLOOR SINK DETAIL
No Scale



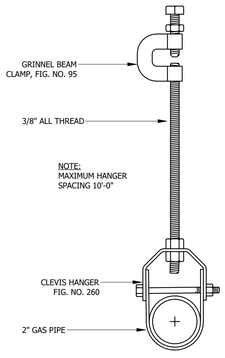
6 ROOF HYDRANT DETAIL
No Scale



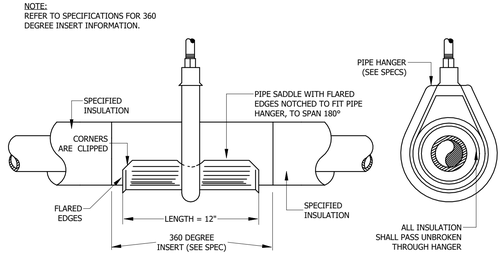
7 GAS WATER HEATER DETAIL
No Scale



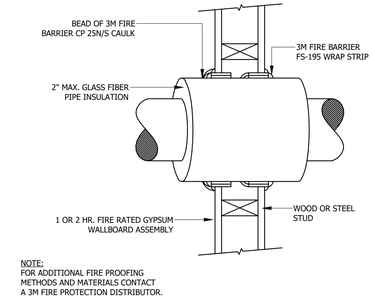
9 GAS METERING DETAIL
No Scale



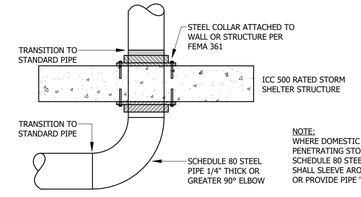
10 GAS PIPE SUPPORT DETAIL
No Scale



11 INSULATED PIPE HANGER DETAIL
No Scale



12 1 HOUR INSULATED PIPE/DUCT AND 2 HOUR INSULATED PIPE DETAIL
No Scale



13 STORM SHELTER PIPE PENETRATION DETAIL - FIELD FABRICATED1
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
PLUMBING DETAILS

SHEET:
P5.01

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PLUMBING SPECIALITIES SCHEDULE

UNIT	TYPE	MANUFACTURER	MODEL	DESCRIPTION	MISCELLANEOUS & ACCESSORIES	APPROVED EQUALS
DSO-1	DOWNSPOUT NOZZLE	WATTS	RD-940	NICKEL BRONZE DOWNSPOUT NOZZLE WITH ANCHOR FLANGE AND COUNTERSUNK MOUNTING HOLES.	ARCHITECT TO SELECT FINISH. CONTRACTOR TO SELECT OUTLET TYPE. OUTLET SIZE AS NOTED ON DRAWINGS.	SMITH, ZURN, JOSAM, WADE, SUN DRAINAGE, ENGINEER APPROVED EQUAL
FD-1	FLOOR DRAIN	WATTS	FD-100-A	EPOXY COATED CAST IRON BODY, ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR, PRIMARY AND SECONDARY WEEP HOLES, ADJUSTABLE 7" DIAMETER NICKEL BRONZE STRAINER, ASME A112.6.3 HEAVY DUTY STRAINER, 4" NICKEL BRONZE FUNNEL, SEDIMENT BUCKET, TRAP PRIMER.	PROVIDE WITH MEMBRANE CLAMP ON ALL FLOOR DRAINS INSTALLED ABOVE SLAB ON GRADE. PROVIDE WITH STRAINER EXTENSION TO ACCOMMODATE THICK FILLS AS REQUIRED. CONTRACTOR TO SELECT OUTLET TYPE. OUTLET SIZE AS NOTED ON DRAWINGS.	SMITH, ZURN, JOSAM, WADE, SUN DRAINAGE, ENGINEER APPROVED EQUAL
FD-2	FLOOR DRAIN	WATTS	FD-1100-A-LR	EPOXY COATED CAST IRON BODY, ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR, PRIMARY AND SECONDARY WEEP HOLES, ADJUSTABLE LIGATURE-RESISTANT SQUARE STAINLESS STEEL STRAINER WITH TAMPER-RESISTANT FASTENERS, HEEL-PROOF STRAINER, SEDIMENT BUCKET, TRAP PRIMER.	PROVIDE WITH MEMBRANE CLAMP ON ALL FLOOR DRAINS INSTALLED ABOVE SLAB ON GRADE. PROVIDE WITH STRAINER EXTENSION TO ACCOMMODATE THICK FILLS AS REQUIRED. CONTRACTOR TO SELECT OUTLET TYPE. OUTLET SIZE AS NOTED ON DRAWINGS.	SMITH, ZURN, JOSAM, WADE, SUN DRAINAGE, ENGINEER APPROVED EQUAL
HB-1	HOSE BIBB	WOODFORD	B24	INTERIOR: BRASS WITH INTEGRAL MOUNTING FLANGE, REPLACEABLE HEXAGONAL DISC, HOSE THREAD SPOUT, CHROME PLATED LOCKABLE BOX AND REMOVABLE KEY,INTEGRAL VACUUM BREAKER IN CONFORMANCE WITH ASSE 1011.	ARCHITECT TO SELECT FINISH.	PRIER, ENGINEER APPROVED EQUAL
MMV-1	MASTER MIXING VALVE	LAWLER	803	MASTER MIXING VALVE, ASSE 1017 RATED, PROVIDE UNIONS AND SHUT OFF VALVES ON ALL INLETS AND OUTLETS. SET DISCHARGE TEMPERATURE TO 120°F.	-	ENGINEER APPROVED EQUAL
ORD-1	ROOF DRAIN	WATTS	RD-100 (UP TO 6") RD-300 (8" AND OVER)	EPOXY COATED CAST IRON BODY WITH FLASHING CLAMPS WITH INTERNAL GRAVEL STOP, ASME A112.6.4.	PROVIDE WITH SUMP RECEIVER, UNDER DECK CLAMP, AND ADJUSTABLE EXTENSION FLANGE. PROVIDE WITH ELASTOMERIC FLANGE WHEN INSTALLED WITH POURED OR TROWELED ELASTOMERIC COMPOSITES. PROVIDE ALUMINUM DOME STRAINER. CONTRACTOR TO SELECT OUTLET TYPE. SEE DRAWINGS FO	SMITH, ZURN, JOSAM, WADE, SUN DRAINAGE, ENGINEER APPROVED EQUAL
RD-1	ROOF DRAIN	WATTS	RD-100 (UP TO 6") RD-300 (8" AND OVER)	EPOXY COATED CAST IRON BODY WITH FLASHING CLAMPS WITH INTERNAL GRAVEL STOP, ASME A112.6.4.	PROVIDE WITH SUMP RECEIVER, UNDER DECK CLAMP, AND ADJUSTABLE EXTENSION FLANGE. PROVIDE WITH ELASTOMERIC FLANGE WHEN INSTALLED WITH POURED OR TROWELED ELASTOMERIC COMPOSITES. PROVIDE ALUMINUM DOME STRAINER. CONTRACTOR TO SELECT OUTLET TYPE. SEE DRAWINGS FO	SMITH, ZURN, JOSAM, WADE, SUN DRAINAGE, ENGINEER APPROVED EQUAL
RH-1	ROOF HYDRANT	WOODFORD	SRH-MS	ASSE 1052 BACKFLOW PREVENTION, ASSE 1057 SANITARY, FREEZE PROOF, SELF-DRAINING, ANTI-SIPHON, VACUUM BREAKER ROOF HYDRANT.	DRAINAGE ASSEMBLY: SEALED RESERVOIR LOCATED BELOW ROOF. DRAINING OF THE RESERVOIR SHALL NOT BE REQUIRED. MOUNTING SYSTEM: CAST IRON ADJUSTABLE BRACKET SUPPORT WITH ABOVE AND UNDER DECK FLANGE, WELL SEALS AND EDPM BOOT COVER.	ENGINEER APPROVED EQUAL
VB-1	VALVE BOX	GUY GRAY	MIB1HAAB	4-1/8"x4-3/4"x2" WHITE POWDER-COATED STEEL, RECESSED BOX WITH FACEPLATE FRAME, (1) 1/2" QUARTER-TURN ARRESTOR VALVE WITH SWEAT CONNECTION, NO DRAIN.	-	ENGINEER APPROVED EQUAL
WH-1	WALL HYDRANT	WOODFORD	B67	ASSE 1019 NON-FREEZE, SELF-DRAINING TYPE WITH POLISHED BRAS LOCKABLE RECESSED BOX HOSE THREAD SPOUT, LOCKSHIELD AND REMOVABLE KEY WITH INTEGRAL DOUBLE CHECK BACKFLOW PREVENTER, 3/4" INLET AND OUTLET.	ARCHITECT TO SELECT FINISH.	PRIER, ENGINEER APPROVED EQUAL
WHA-1	WATER HAMMER ARRESTOR	SIOUX CHIEF	650	ANSI A112.26.1, ASSE 1010, PISTON TYPE WATER HAMMER ARRESTOR, COPPER BODY, POLY PISTON WITH EPDM O-RINGS, CONNECTION TYPE AS SPECIFIED FOR PIPING SYSTEM, SUITABLE FOR INSTALLATION AT ANY ANGLE, APPROVED FOR INSTALLATION	PROVIDE WATER HAMMER ARRESTORS ON COLD AND HOT WATER SUPPLY PIPING TO EACH FIXTURE OR GROUP OF FIXTURES. LOCATE AND SIZE PER PDI STANDARD WH-201.	ZURN, ENGINEER APPROVED EQUALS

PLUMBING FIXTURE SCHEDULE

GENERAL NOTE: ALL PLUMBING FIXTURE SELECTIONS, REGARDLESS OF THIS SCHEDULE, SHALL BE SUBMITTED FOR THE BUILDING OWNER'S AND ARCHITECT'S PRE-APPROVAL PRIOR TO CONTRACTOR'S PURCHASE ORDER OF ALL PLUMBING FIXTURES.

UNIT	PF1	MANUFACTURER	MODEL	MATERIAL	COLOR	ADA	FIXTURE DESCRIPTION	MISCELLANEOUS	TRIM	APPROVED EQUALS
EWC-1	ELECTRIC WATER COOLER	ELKAY	EZSTL8WSLK	STAINLESS STEEL/PLASTIC	GRAY/STEEL	YES	BI-LEVEL ELECTRIC WATER COOLER WITH INTEGRAL AIR-COOLED CHILLER, AUTOMATIC STREAM REGULATOR, ANTI-SQUIRT BUBBLER WITH STREAM GUARD BOTTLE FILL WITH NO TOUCH SENSOR ACTIVATION, 20 SEC AUTO SHUT-OFF, NON-FILTERED, BOTTLE FILLS STATION TO BE LOCATED ON HIGH WATER COOLER OF BI-LEVEL	CAPACITY: 8.0 GPH OF 50 DEGREE FARENHEIGHT WATER WITH INLET AT 80 DEGREE FARENHEIGHT AND ROOM TEMP OF 90 DEGREE FARENHEIGHT, MAX 1/5 HP COMPRESSOR, 120V/1PHASE, WARRANTY: 1 YEAR ELECTRONIC COMPONENT, 5 YEAR REFRIGERATION SYSTEM	-	HALSEY TAYLOR, ENGINEER APPROVED EQUAL
L-1	LAVATORY	KOHLER	SOHO K-2054-0	VITREOUS CHINA	WHITE	SEE ARCH.	18"x20" WALL MOUNTED LAVATORY, THREE HOLE, 4" CENTERS. PROVIDE WITH WHITE VIRTEOUS CHINA SHROUD FOR PIPE CONCEALMENT BELOW LAVATORY.	WATTS WCA-411 FLOOR MOUNTED LAVATORY CARRIER. VERIFY MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.	LF-1	AMERICAN STANDARD, SLOAN
L-2	SINK	-	-	-	-	-	INTEGRAL SINK BY OTHERS.	-	LF-2	-
S-1	SINK	ELKAY	DLR312212	STAINLESS STEEL	STEEL	SEE ARCH.	28"X16"X11-1/2" DEEP SINGLE BOWL, 304SS 18 GA, SELF RIM, UNDERCOATED, PROVIDE CONFIGURATION OF HOLES TO MATCH SCHEDULED TRIM.	COORDINATE WITH CASEWORK DIMENSIONS. SEE ARCHITECTURAL DRAWINGS.	SF-1	JUST, ENGINEER APPROVED EQUAL
S-2	SINK	ELKAY	DLR332212	STAINLESS STEEL	STEEL	SEE ARCH.	13-1/2"X16"X11-1/2" DEEP DOUBLE BOWL, 304SS 18 GA, SELF RIM, UNDERCOATED, PROVIDE CONFIGURATION OF HOLES TO MATCH SCHEDULED TRIM.	COORDINATE WITH CASEWORK DIMENSIONS. SEE ARCHITECTURAL DRAWINGS.	SF-1	JUST, ENGINEER APPROVED EQUAL
SH-1	SHOWER	INPRO	PRISM	APPLIED ACRYLIC	WHITE	SEE ARCH.	36" X 36", SLIP-RESISTANT TEXTURED BOTTOM, MOLDED TOILETRY SHELVES, CURTAIN ROD, TRENCH DRAIN.	PROVIDE TRENCH DRAIN COMPATIBLE WITH SHOWER BASE, VERIFY TRIM MOUNTING HEIGHT WITH ARCH.	SHA-1, SHA-2	ENGINEER APPROVED EQUAL
U-1	URINAL	KOHLER	BARDON K-4991-ET-0	VITREOUS CHINA	WHITE	SEE ARCH.	0.125 GPF, WALL HUNG, HIGH EFFICIENCY WASHOUT FLUSHING ACTION, INTEGRAL TRAP, VANDAL RESISTANT OUTLET STRAINER, 3/4 INCH TOP SPUD, TWO INCH THREADED OUTLET	-	UFV-1, WCA-3	AMERICAN STANDARD, SLOAN
WC-1	WATER CLOSET	KOHLER	KINGSTON K-84325	VITREOUS CHINA	WHITE	SEE ARCH.	1.6 GPF, WALL MOUNTED, SIPHON JET, 1-1/2" TOP SPUD. CHINA BOLT CAPS, ADA CAPABLE.	COORDINATE FLUSH VALVE STYLE WITH GRAB BARS, CONTROLS FOR FLUSH VALVES MOUNT ON THE WIDE SIDE OF THE TOILET, VERIFY MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.	WCFV-1, WCA-1, WCA-2	AMERICAN STANDARD, SLOAN
WC-2	WATER CLOSET	KOHLER	HIGHCLIFF K-96057-0	VITREOUS CHINA	WHITE	SEE ARCH.	1.6 GPF, FLOOR MOUNTED, SIPHON JET, 1-1/2" TOP SPUD. CHINA BOLT CAPS, ADA CAPABLE.	COORDINATE FLUSH VALVE STYLE WITH GRAB BARS, CONTROLS FOR FLUSH VALVES MOUNT ON THE WIDE SIDE OF THE TOILET, VERIFY MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.	WCFV-1, WCA-1, WCA-2	AMERICAN STANDARD, SLOAN
WC-3	WATER CLOSET	KOHLER	KINGSTON K-84325	VITREOUS CHINA	WHITE	SEE ARCH.	1.6 GPF, WALL MOUNTED, SIPHON JET, 1-1/2" TOP SPUD. CHINA BOLT CAPS, ADA CAPABLE.	COORDINATE FLUSH VALVE STYLE WITH GRAB BARS, CONTROLS FOR FLUSH VALVES MOUNT ON THE WIDE SIDE OF THE TOILET, VERIFY MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.	WCFV-2, WCA-1, WCA-2	AMERICAN STANDARD, SLOAN

PLUMBING FIXTURE TRIM SCHEDULE

GENERAL NOTE: ALL PLUMBING FIXTURE SELECTIONS, REGARDLESS OF THIS SCHEDULE, SHALL BE SUBMITTED FOR THE BUILDING OWNER'S AND ARCHITECT'S PRE-APPROVAL PRIOR TO CONTRACTOR'S PURCHASE ORDER OF ALL PLUMBING FIXTURES.

UNIT	TYPE	MANUFACTURER	MODEL	COLOR	FIXTURE DESCRIPTION	MISCELLANEOUS	APPROVED EQUALS
LF-1	LAVATORY FAUCET	SLOAN	ETF-600-A	CHROME	SENSOR OPERATED CENTER SET ELECTRONIC HAND WASHING FAUCET, 0.5 GPM LAMINAR FLOW, VANDAL-RESISTANT AERATOR, HARD WIRED 120 VAC INPUT 24 VAC TRANSFORMER, 24V WIRING. 24 WIRING SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR.	SLOAN #BDT THERMOSTATIC VALVE OR EQUAL. METAL GRID STRAINER WITH 1-1/2" 17 GA CHROME PLATED P-TRAP, OFFSET TAILPIECE AS REQUIRED, TRU-BRO LAV GUARD, 1/4 TURN LOOSE KEY STOPS. REFER TO SECTION 22 400 PART 3 FOR MIXING VALVE AND CONTROL MODULE LOCATION.	ENGINEER APPROVED EQUAL
LF-2	LAVATORY FAUCET	SLOAN	EBF-650	CHROME	BATTERY POWERED, SENSOR OPERATED CENTER SET ELECTRONIC HAND WASHING FAUCET, 0.5 GPM LAMINAR FLOW, VANDAL-RESISTANT AERATOR.	SLOAN #BDT THERMOSTATIC VALVE OR EQUAL, METAL GRID STRAINER WITH 1-1/2" 17 GA CHROME PLATED P-TRAP, OFFSET TAILPIECE AS REQUIRED, TRU-BRO LAV GUARD, 1/4 TURN LOOSE KEY STOPS. REFER TO SECTION 22 400 PART 3 FOR MIXING VALVE AND CONTROL MODULE LOCATION.	ENGINEER APPROVED EQUAL
LF-3	LAVATORY FAUCET	DELTA	523LF-HDMHDF	CHROME	MANUAL, 0.5 GPM LAMINAR FLOW VANDAL-RESISTANT AERATOR, METAL GRID STRAINER, SINGLE LEVER.	METAL GRID STRAINER WITH 1-1/2" 17 GA CHROME PLATED P-TRAP, OFFSET TAILPIECE AS REQUIRED, TRU-BRO LAV GUARD, 1/4 TURN LOOSE KEY STOPS.	ENGINEER APPROVED EQUAL
SF-1	SINK FAUCET	DELTA	100LF-HDF	CHROME	8-11/16" SWING SPOUT, 1.5 GPM, AERATOR, SINGLE LEVER HANDLE, MOUNTS ON 8" CENTERS	DEARBORN BRASS 16 GRID STRAINER, 17 GA 1-1/2" CHROME PLATED P-TRAP W/ CLEANOUT, 1/4 TURN LOOSE KEY STOPS	ENGINEER APPROVED EQUAL
SHA-1	SHOWERHEAD	SYMMONS	9605-PLR-TRM	CHROME	2.5 GPM SUPER SHOWERHEAD WITH ADJUSTABLE SPRAY, 3-1/4" DIAMETER, 2 MODE	VERIFY MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS	POWERS, ENGINEER APPROVED EQUAL
SHA-2	SHOWER VALVE	SYMMONS	C-96-1-X	BY ARCH.	2.5 GPM STANDARD, CONCEALED SHOWER VALVE AND TRIM, TEMPTROL PRESSURE BALANCING VALVE, METAL LEVER HANDLE, 1 MODE SHOWERHEAD	-	BRADLEY, POWERS, ENGINEER APPROVED EQUAL
UCA-1	URINAL CARRIER	ZURN	Z1222	-	DRAIN HUB AND VENT, WALL ATTACHMENT.	-	JOSAM, WATTS, ENGINEERED APPROVED EQUAL
UFV-1	URINAL FLUSH VALVE	SLOAN	ECOS 8186-0.125	CHROME	0.125 GPF, FLEX TUBE DIAPHRAGM, BATTERY OPERATED SENSOR (4AA BATTERIES INCLUDED), INTEGRAL SCREW DRIVER ANGLE STOP, SWEAT SOLDER ADAPTER, VACUUM BREAKER, OVERRIDE BUTTON, VANDAL RESISTANT STOP CAP, FIXED METERING BYPASS.	-	NO APPROVED EQUAL
WCA-1	WATER CLOSET CARRIER	JOSAM	14404 AND 14424	-	DRAIN HUB AND VENT, WALL ATTACHMENT	-	ZURN, WATTS, ENGINEER APPROVED EQUAL
WCA-2	SEAT	CHURCH	295SSSCT	WHITE	ELONGATED OPEN FRONT, SOLID WHITE PLASTIC, EXTENDED BACK, SELF-SUSTAINING CHECK HINGE, STAINLESS STEEL BOLTS.	-	BEMIS, ENGINEER APPROVED EQUAL
WCFV-1	WATER CLOSET FLUSH VALVE	SLOAN	ECOS 111-1.6	CHROME	1.6 GPF, HARDWIRED SENSOR ACTIVATED FLUSHOMETER, FLEX TUBE DIAPHRAGM, INTEGRAL SCREW DRIVER ANGLE STOP, SWEAT SOLDER ADAPTER, VACUUM BREAKER, OVERRIDE BUTTON, VANDAL RESISTANT STOP CAP, FIXED METERING BYPASS	-	NO APPROVED EQUAL
WCFV-2	WATER CLOSET FLUSH VALVE	SLOAN	ROYAL-111-1.6	CHROME	1.6 GPF, MANUAL FLUSH VALVE, DIAPHRAGM TYPE WITH OSCILLATING HANDLE, ESCUTCHEON, SEAT BUMPER, ANGLE STOP WITH VANDAL RESISTANT CAP AND VACUUM BREAKER.	-	NO APPROVED EQUAL

GAS WATER HEATER SCHEDULE

UNIT TAG	P01	MODEL	STORAGE CAPACITY (GAL)	FUEL TYPE	INPUT (BTU/H)	MIN RECOVERY 100ºF RISE (GPH)	THERMAL EFFICIENCY (%)	INTAKE/VENT SIZE (IN)	VOLTAGE/Ø
GWH-1	A.O. SMITH	CYCLONE XI BTX 100	75	NATURAL GAS	100,000	115	98	3	120/1

NOTES:
1. ASME RATED.
2. ROUTE INTAKE/FLUE PER MANUFACTURER'S REQUIREMENTS.
3. PROVIDE WITH MANUFACTURER'S CONDENSATE NEUTRALIZATION KIT.
4. PROIVDE WITH MANUFACTURER'S CONCENTRIC VENT KIT AND REFER TO ARCHITECT FOR PAINTING REQUIREMENTS.
5. PIPE WATER HEATER DISCHARGE TO FLOOR DRAIN/SINK.
6. FLUE MATERIAL SHALL BE SCHEDULE 80 CPVPC WITH MAXIMUM LENGTH OF 100' WITH A MAXIMUM OF FOUR 90 DEGREE ELBOWS. BASED ON 3" FLUES. REFER TO MECHANICAL PLANS FOR MORE INFORMATION.

ELECTRIC WATER HEATER SCHEDULE

UNIT TAG	MANUFACTURER	MODEL	STORAGE CAPACITY (GAL)	MIN. RECOVERY AT 90°F RISE (GPH)	NUMBER OF ELEMENTS	SIMULTANEOUS?	TOTAL POWER (KW)	ELECTRICAL		
								FLA	MOCP	VOLTAGE/PHASE
EWH-1	A.O. SMITH	DEL-10	10	7	1	NO	1.5	12.5	20	120/1

NOTES:
1. UNIT TO HAVE ELECTRONIC IGNITION AND CONTROLS, NON-CORROSIVE LINING, FULL-SIZE HOT AND COLD WATER DIELECTRIC UNIONS AND INTEGRAL HEAT TRAPS.
2. PROVIDE MINIMUM 15 YEAR TANK AND HEAT EXCHANGER WARRANTY WITH ONE YEAR PARTS WARRANTY.
3. PROVIDE MINIMUM 10 GALLON EXPANSION TANK (THERM-X-TROL ST-25V OR EQUAL).

PUMP SCHEDULE

UNIT TAG	MANUFACTURER	MODEL	SYSTEM	LOCATION	FLOW RATE (GPM)	TOTAL HEAD (FT)	EFFICIENCY (%)	MOTOR BHP	SPEED (RPM)	VFD	FLA	MOCP	V/PH
CP-1	GRUNDFOS	UPS 26-99 SFC	HOT WATER RECIRC	SERVICE	5	20	12	0.25	3400	NO	1.8	15	120/1
CP-2	GRUNDFOS	UPS 26-99 SFC	HOT WATER RECIRC	STORM SHELTER	1	15	12	0.25	3400	NO	1.8	15	120/1

NOTES:
1. PUMP TO BE LEAD FREE CONSTRUCTION AND APPROVED FOR USE IN POTABLE WATER SYSTEMS (NSF 61 CERTIFIED).
2. PROVIDE WITH AQUASTAT TO ENERGIZE PUMP WHEN PIPE TEMPERATURE DROPS TO 110°F AND DE-ENERGIZE PUMP WHEN PIPE TEMPERATURE REACHES 120°F.
3. PROVIDE WITH TIMER TO BE SET TO OWNER SPECIFIED HOURS OF OCCUPANCY.

WATER SOFTENER SCHEDULE

UNIT TAG	MANUFACTURER	MODEL	TYPE	FLOW RATE (GPM)	PEAK FLOW RATE (GPM)	TANK DIMENSIONS (DIAMETER X HEIGHT)	ELECTRICAL	
							MOCP	VOLTAGE/PHASE
WS-1	WCC	LF-450-TWIN	DUPLEX	112	98	39X48	15	120/1

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
PLUMBING SCHEDULES

SHEET:
P6.01

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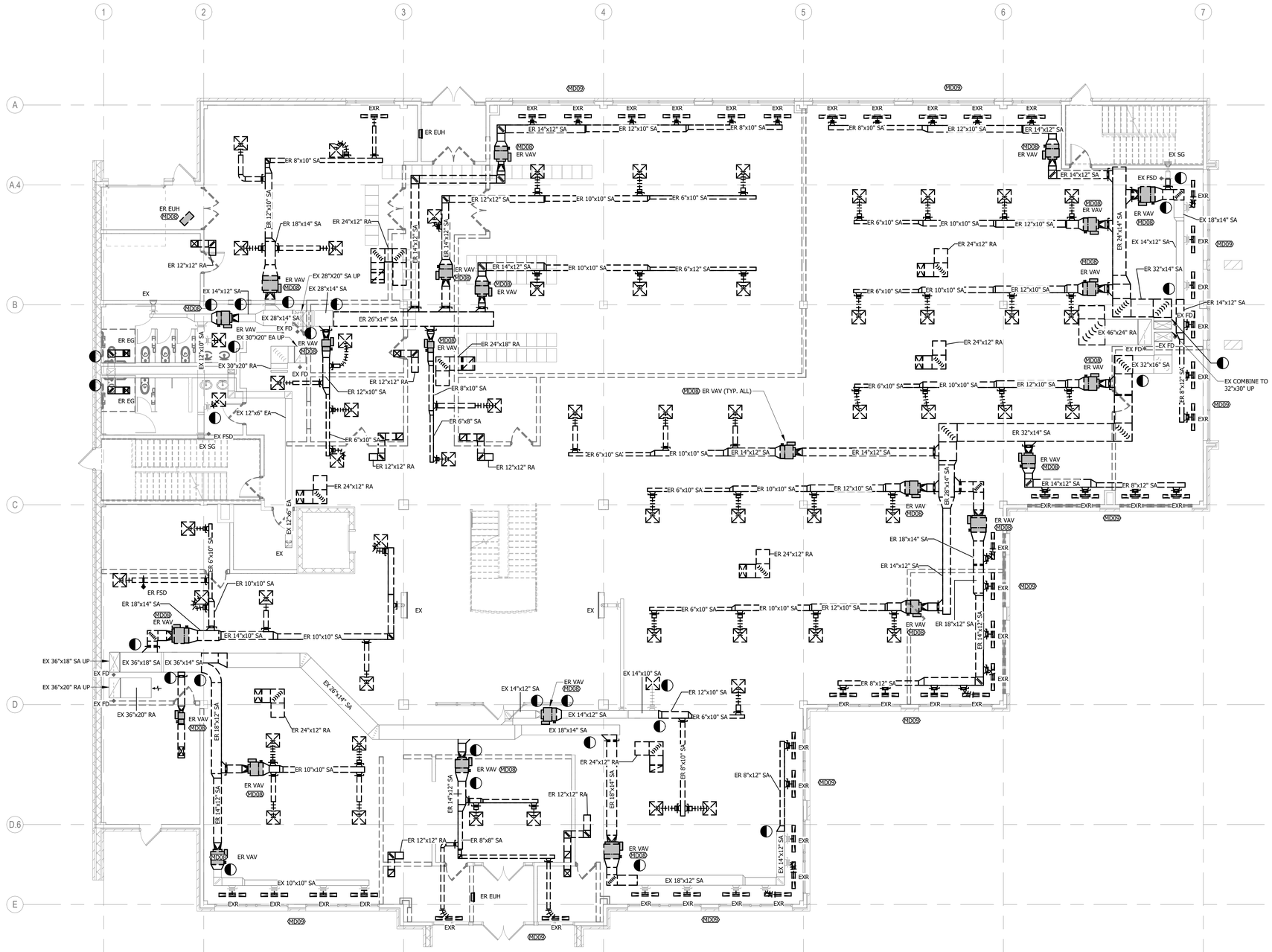

1 HVAC DEMOLITION FIRST FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. MECHANICAL AND ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL MECHANICAL EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING MECHANICAL AND ELECTRICAL SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

MD08 CONTRACTOR TO DEMO EXISTING EQUIPMENT AND ITS ASSOCIATED CONTROLS AND WIRING.

MD09 CONTRACTOR SHALL PROTECT ALL PERIMETER LINEAR SLOT DIFFUSERS FOR REUSE ON NEW HVAC PLANS. REMOVE AND REINSTALL AS REQUIRED FOR CEILING WORK. REFER TO NEW HVAC PLANS FOR DETAILS.

NOTE:
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SHEET NAME:
FIRST FLOOR HVAC DEMOLITION PLAN

SHEET:
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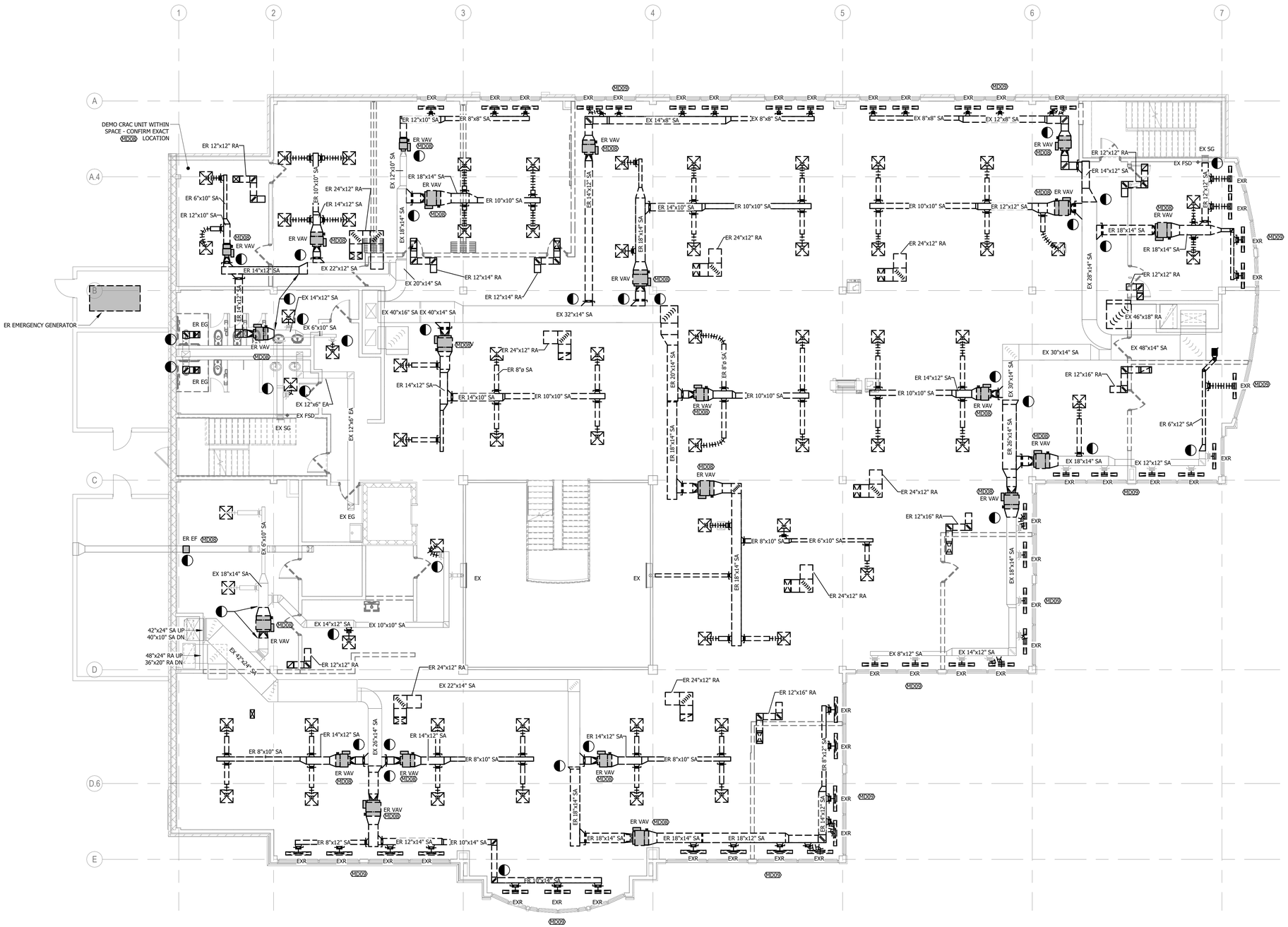

1 HVAC DEMOLITION SECOND FLOOR
1/8" = 1'-0"

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BID DOCUMENTS

SHEET NAME:
SECOND FLOOR HVAC DEMOLITION PLAN

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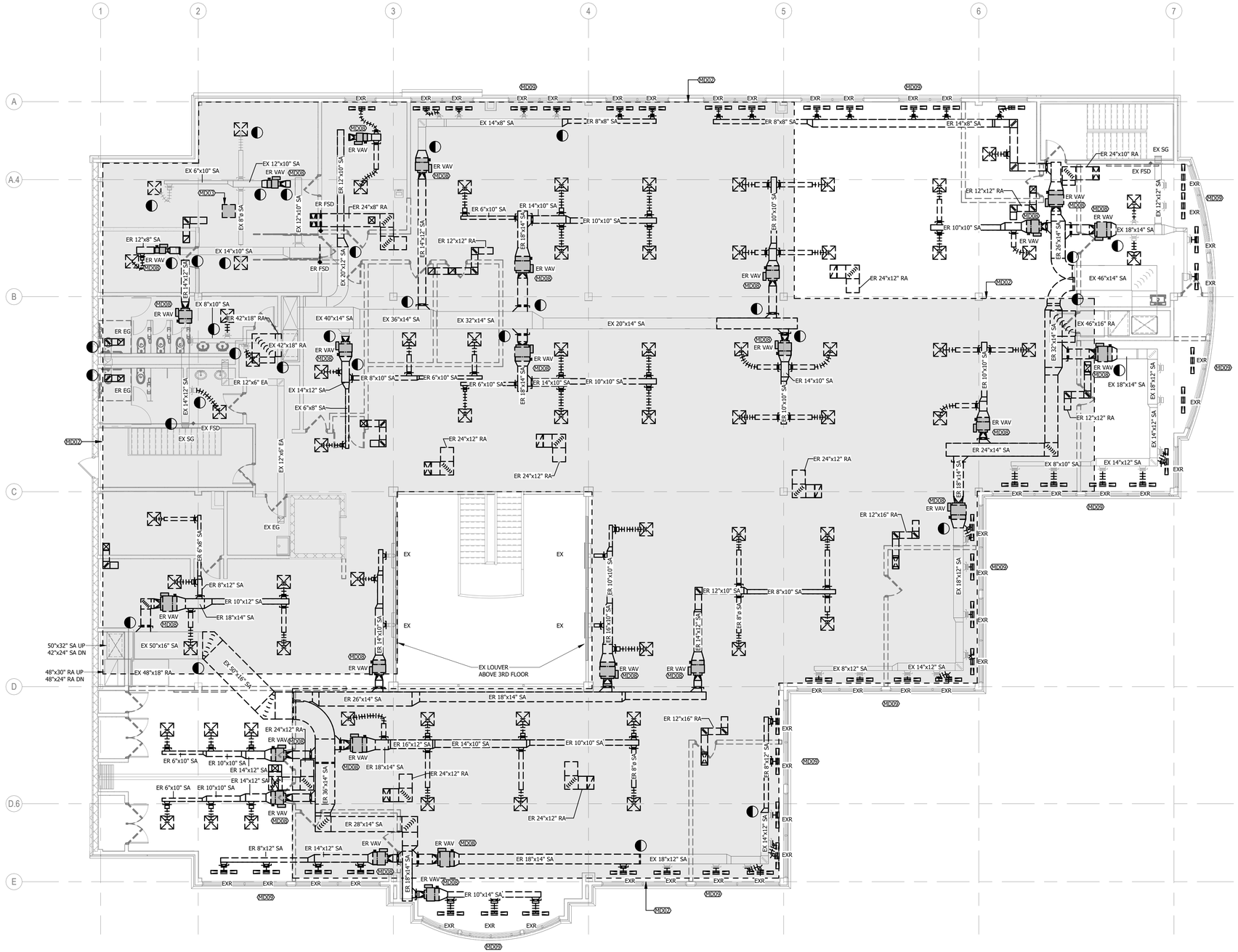
24-187 - CITY HALL RELOCATION



1 HVAC DEMOLITION THIRD FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

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G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

REFERENCED NOTES

MD02 HVAC IN THIS AREA TO BE REWORKED/REMOVED AS NEEDED FOR STRUCTURAL REINFORCEMENT WORK. COORDINATE WITH STRUCTURAL DRAWINGS.

MD03 COMPUTER ROOM AIR CONDITIONING UNIT MOUNTED ABOVE CEILING. RS & RL UP TO ROOF. PUMPED CONDENSATE DISCHARGE TO ROOF. DEMO ALL.

MD08 CONTRACTOR TO DEMO EXISTING EQUIPMENT AND ITS ASSOCIATED CONTROLS AND WIRING.

MD09 CONTRACTOR SHALL PROTECT ALL PERIMETER LINEAR SLOT DIFFUSERS FOR REUSE ON NEW HVAC PLANS. REMOVE AND REINSTALL AS REQUIRED FOR CEILING WORK. REFER TO NEW HVAC PLANS FOR DETAILS.

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BID DOCUMENTS

SHEET NAME:
THIRD FLOOR HVAC DEMOLITION PLAN

SHEET:
MD1.13

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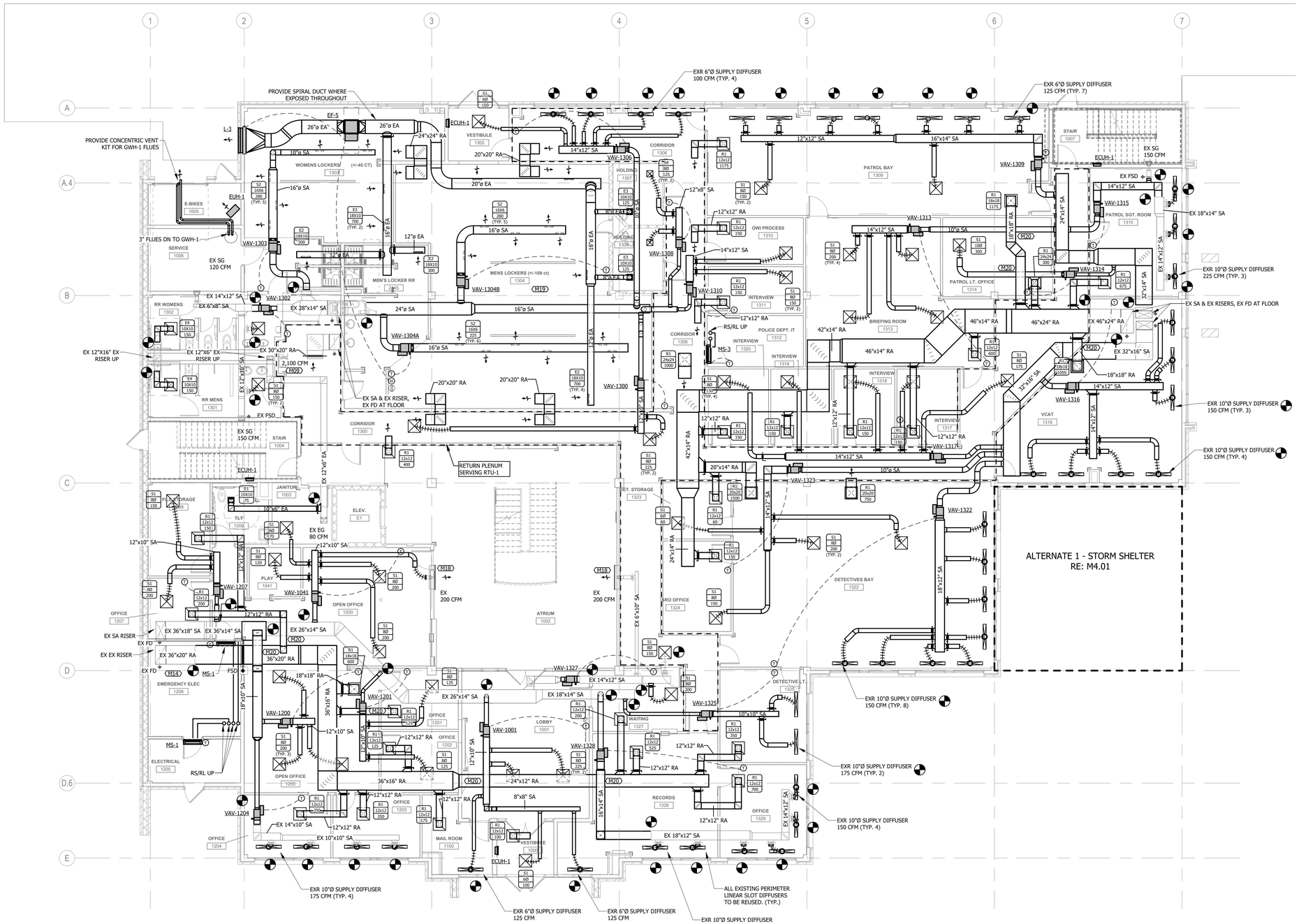

GENERAL NOTES:

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B. MAINTAIN SERVICE CLEARANCE IN FRONT OF AND ABOVE ELECTRICAL EQUIPMENT AND ACCESS. DO NOT INSTALL EQUIPMENT OR ROUTE DUCTS IN CLEARANCE SPACE. REFER TO EQUIPMENT INSTALLATION AND INSTRUCTIONS.

C. COORDINATE THERMOSTAT LOCATIONS WITH CASEWORK, WALL TYPES, AND FURNISHINGS PRIOR TO ROUGH-IN.

D. PROVIDE VOLUME CONTROL BALANCING DAMPERS ON ALL SUPPLY, RETURN, EXHAUST AIR TAPS IN ACCESSIBLE LOCATIONS FOR AIR BALANCING. INSTALL CABLE OPERATED DAMPER OR ACCESS PANEL IF DAMPER IS LOCATED ABOVE GYP CEILINGS.

E. COORDINATE DUCT ROUTING WITH STRUCTURAL AND ALL TRADES.

F. COORDINATE ALL EXPOSED DUCTWORK ROUTING WITH DESIGN TEAM PRIOR TO ROUGH-IN.

G. COORDINATE SUPPLY, RETURN, AND EXHAUST GRILLE/DIFFUSER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLAN AND ALL TRADES.

H. COORDINATE DUCT ROUTING IN LOCATIONS WITH EXISTING CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO ROUGH-IN.

REFERENCED NOTES

M09 STUB RETURN DUCT ABOVE CEILING. BALANCE TO THE SHOWN AIRFLOW.

M14 PROVIDE DRIP PANS BELOW ALL DUCT AND REFRIGERANT PIPE ROUTING ABOVE ELECTRICAL ROOM.

M18 PAINT GRILLE/LOUVER BLACK AT ATRIUM WALL. GRILLE/LOUVER TO BE PARTIALLY COVERED BY ARCHITECTURAL SLATS.

M19 SUPPLY DUCTWORK TO ROUTE BELOW STRUCTURAL BEAMS THROUGHOUT LOCKER ROOM. PROVIDE OFFSET(S) AS REQUIRED TO EXHAUST DUCT WORK WHEN ROUTING PARALLEL TO STRUCTURAL BEAMS.

M20 OFFSET DUCT. ROUTE HIGH BETWEEN BEAMS FOR DUCT CROSSING. FIELD COORDINATE OFFSET AND BEAM LOCATIONS PRIOR TO ROUTING NEW DUCTWORK.

1 HVAC FIRST FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

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SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR HVAC PLAN

SHEET:
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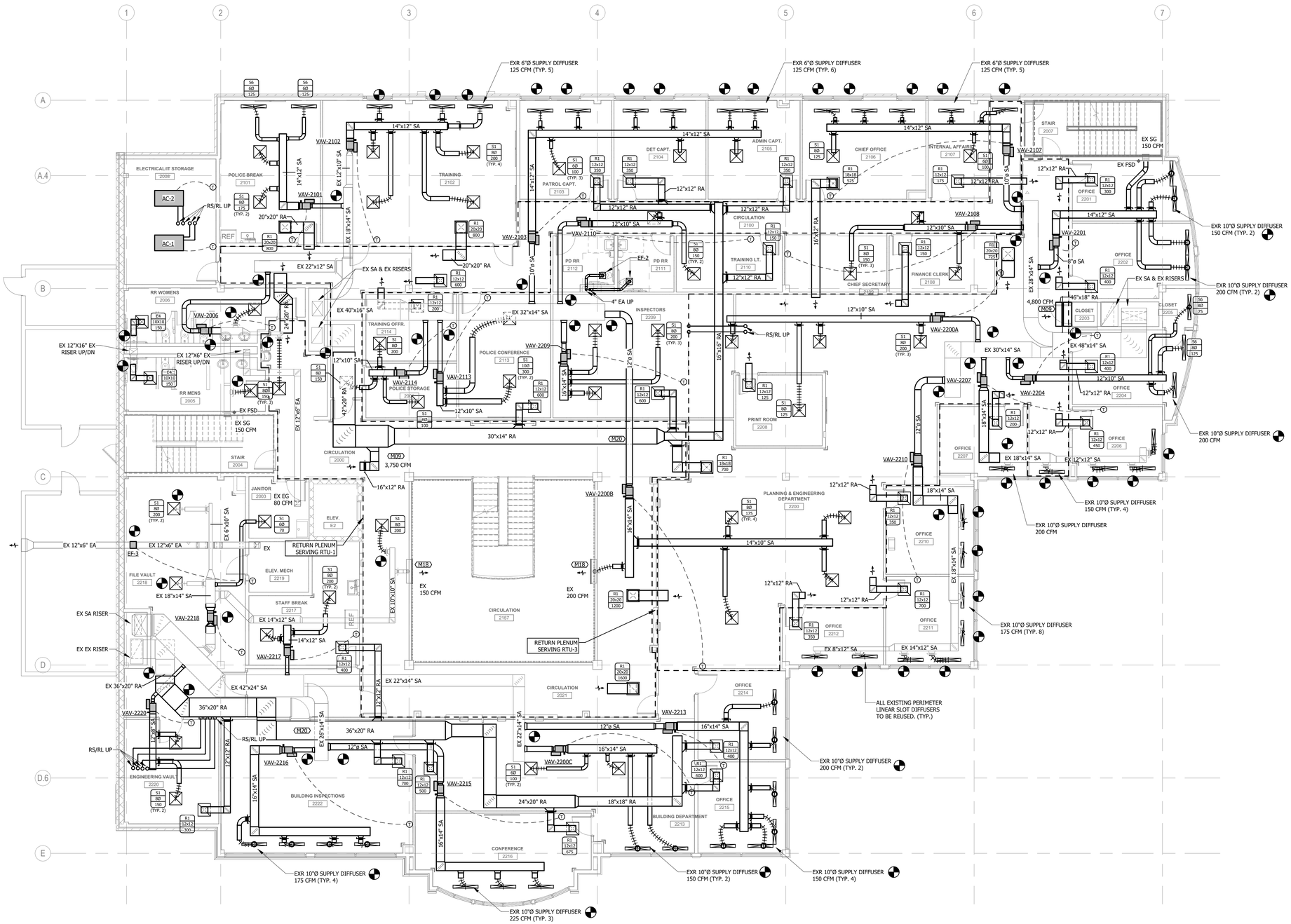

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24-187 - CITY HALL RELOCATION

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M20 OFFSET DUCT. ROUTE HIGH BETWEEN BEAMS FOR DUCT CROSSING. FIELD COORDINATE OFFSET AND BEAM LOCATIONS PRIOR TO ROUTING NEW DUCTWORK.

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SHEET NAME:
SECOND FLOOR HVAC PLAN

SHEET:
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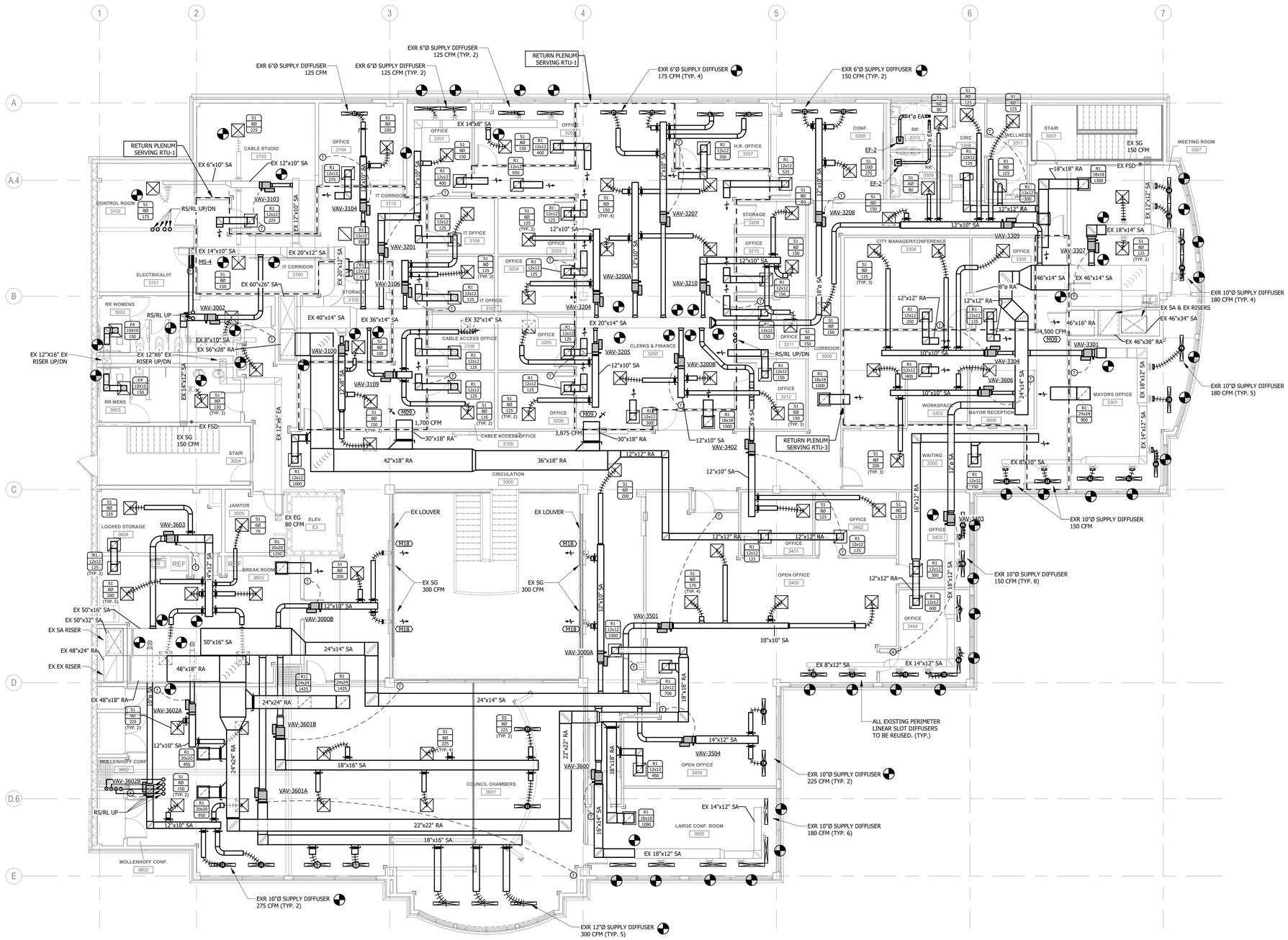

1 HVAC THIRD FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

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SHEET SET: BID DOCUMENTS

SHEET NAME: THIRD FLOOR HVAC PLAN

SHEET: M1.13

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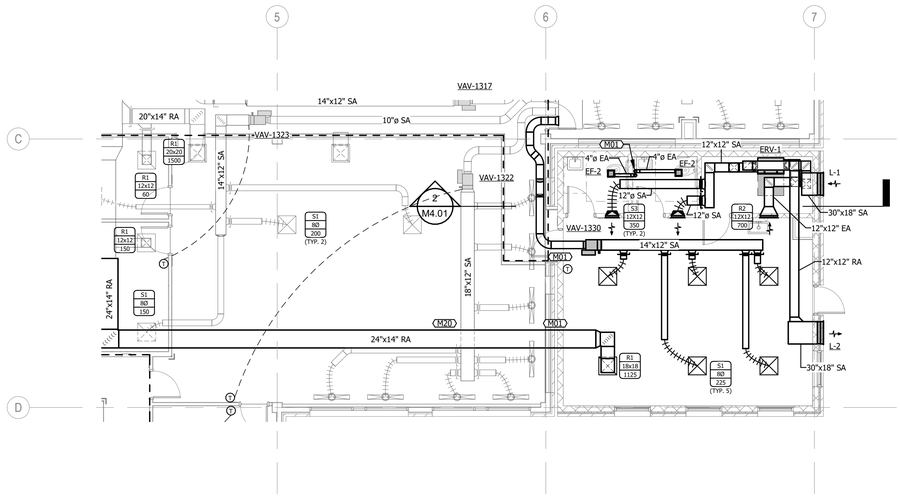

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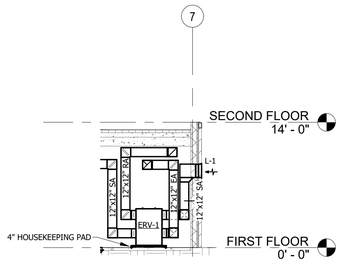
1 HVAC FIRST FLOOR - ALTERNATE 1
1/8" = 1'-0"



2 INTAKE/EXHAUST LOUVERS IN STORM SHELTER
1/8" = 1'-0"

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REFERENCED NOTES

M01 INSTALL SAFE ROOM PROTECTION SHROUD AT WALL/CEILING/ROOF PENETRATION.

M20 OFFSET DUCT. ROUTE HIGH BETWEEN BEAMS FOR DUCT CROSSING. FIELD COORDINATE OFFSET AND BEAM LOCATIONS PRIOR TO ROUTING NEW DUCTWORK.

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BID DOCUMENTS

SHEET NAME:
HVAC ALTERNATE 1 PLANS

SHEET:
M4.01

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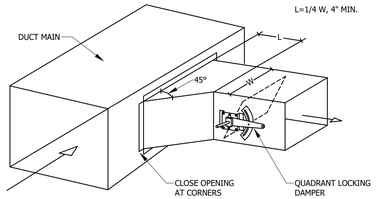
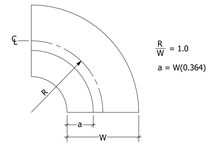
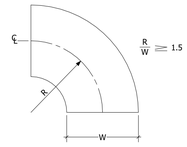


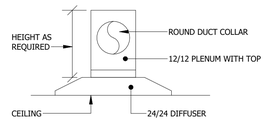
1 45 BRANCH CONNECTION DETAIL
No Scale



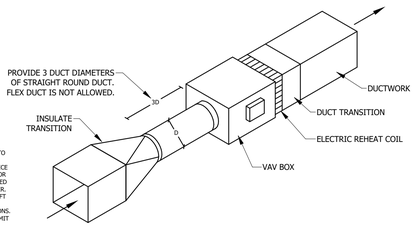
2 ELBOW AND WYE WITH VANE DETAIL
No Scale



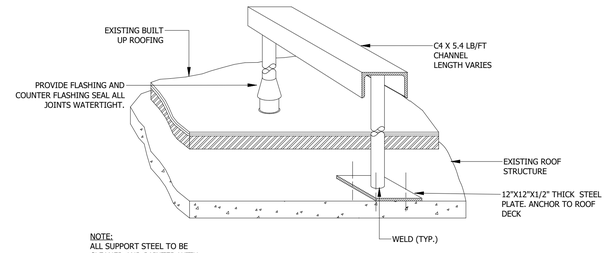
3 ELBOW AND WYE WITHOUT VANE DETAIL
No Scale



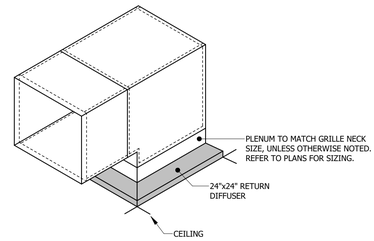
4 DIFFUSER WITH PLENUM DETAIL
No Scale



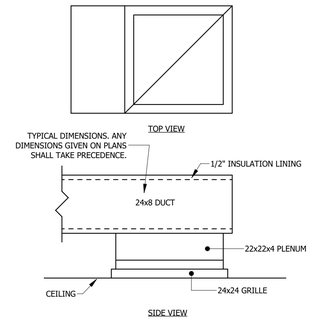
5 SINGLE DUCT VAV CONNECTION DETAIL
No Scale



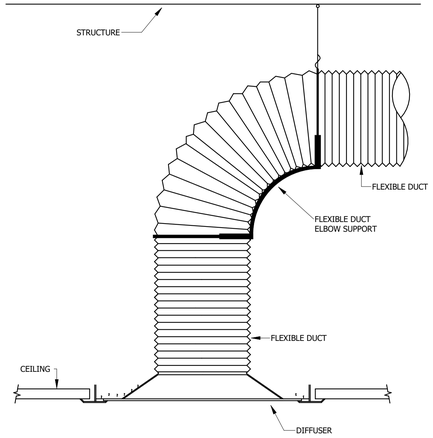
6 DUCT/PIPE ROOF SUPPORT DETAIL
No Scale



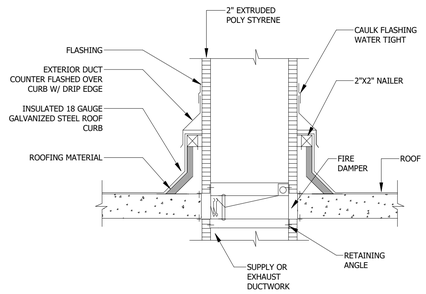
7 24"x24" RETURN GRILLE WITH PLENUM DETAIL
No Scale



8 RETURN BOOT DETAIL
No Scale

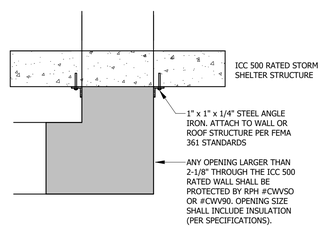


9 FLEXIBLE DUCT SUPPORT DETAIL
No Scale

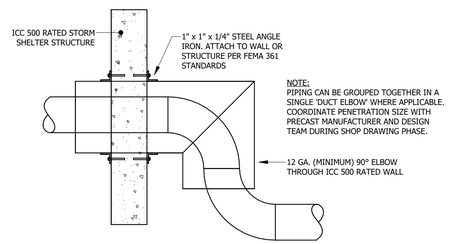


10 DUCT ROOF PENETRATION DETAIL
No Scale

ADD ALTERNATE: STORM SHELTER PENETRATION DETAILS



11 STORM SHELTER DUCTWORK PENETRATION DETAIL
No Scale



12 STORM SHELTER PIPE 'DUCT ELBOW' PENETRATION DETAIL - FIELD FABRICATED
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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MODUS ENGINEERING

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
MECHANICAL DETAILS

SHEET:
M5.01

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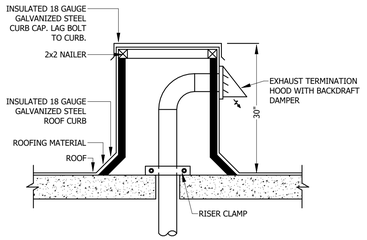
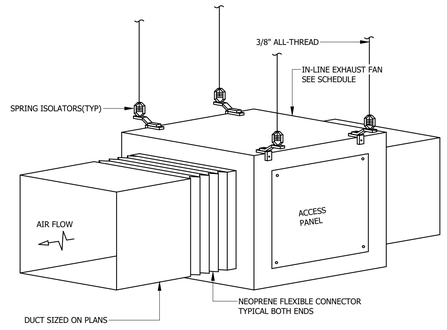
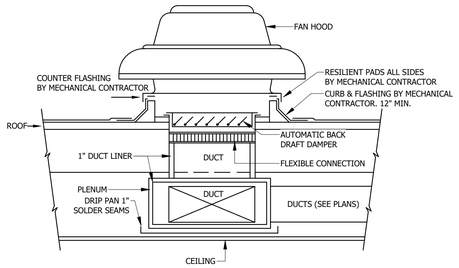


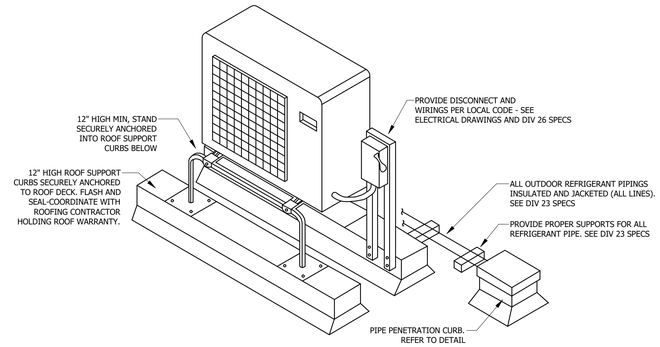
1 ROOF EXHAUST CURB DETAIL
No Scale



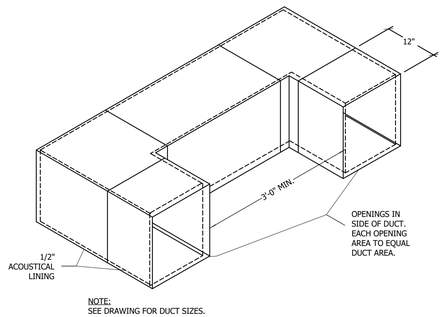
2 IN-LINE EXHAUST FAN DETAIL
No Scale



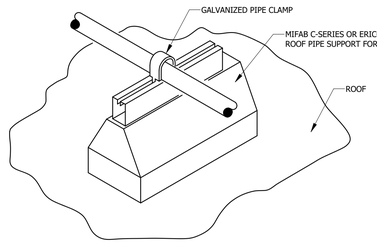
3 ROOF MOUNTED EXHAUST FAN DETAIL
No Scale



4 SPLIT SYSTEM OUTDOOR UNIT DETAIL
No Scale



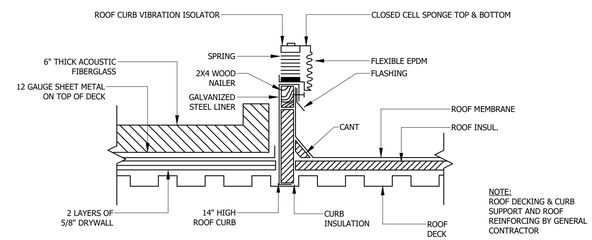
5 TRANSFER DUCT DETAIL
No Scale



GAS PIPING SPACING REQUIREMENTS	
PIPE DIA.	SPACING (FT)
1/2"	6
3/4" OR 1"	8
1-1/4" OR LARGER	10

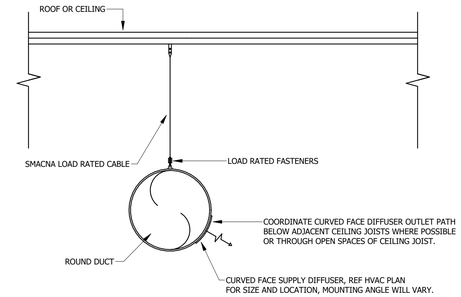
REFRIGERANT PIPING SPACING REQUIREMENTS	
PIPE DIA.	SPACING (FT)
ALL	4

6 NON-PENETRATING ROOF SUPPORT DETAIL
No Scale

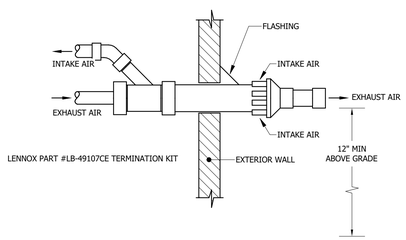


NOTE:
ROOF DECKING & CURB SUPPORT AND ROOF REINFORCING BY GENERAL CONTRACTOR

7 ROOFTOP UNIT CURB WITH SPRING ISOLATION DETAIL
No Scale

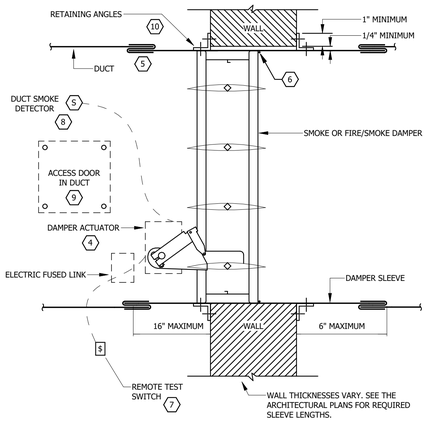


8 SPIRAL DUCT DETAIL
No Scale



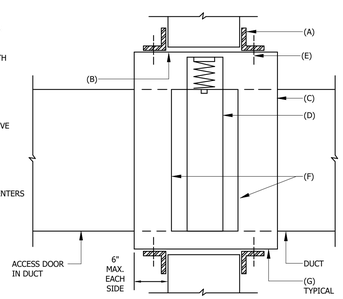
9 FURNACE WALL EXHAUST DETAIL
No Scale

NOTES:
1. REFER TO AND FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. COORDINATE INSTALLATION WITH ELECTRICAL AND FIRE ALARM CONTRACTORS.
3. ALL WIRING BY ELECTRICAL CONTRACTOR. ALL FIRE ALARM DEVICES PROVIDED BY FIRE ALARM CONTRACTOR UNLESS NOTED OTHERWISE.
4. DAMPER ACTUATOR SHALL BE EXTERNALLY MOUNTED. INSTALL DAMPER WITH ACTUATOR ON ACCESSIBLE SIDE OF WALL.
5. CONNECT DAMPER SLEEVE TO DUCT WITH SLIP JOINT CONNECTION.
6. SEAL AROUND DAMPER FRAME WITH NON-FIRE RATED CAULK.
7. LOCATE TEST SWITCH IN ACCESSIBLE LOCATION NEAR DAMPER.
8. DUCT SMOKE DETECTOR PROVIDED [*WITH DAMPER*] [*BY FIRE ALARM CONTRACTOR*]. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9. INSTALL ACCESS DOOR ON ACTUATOR SIDE OF WALL AND IN ACCESSIBLE LOCATION.
10. INSTALL RETAINING ANGLES ON ONE OR BOTH SIDES OF DAMPER. FASTEN TO DUCT/DAMPER AND WALL.

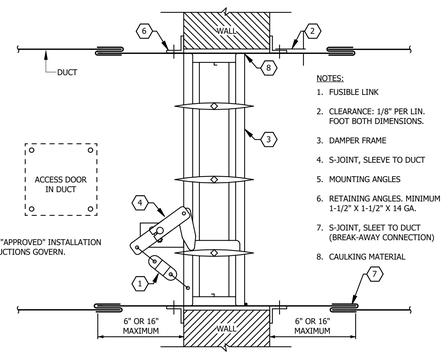


10 COMBINATION FIRE/SMOKE DAMPER DETAIL
No Scale

ITEM DESCRIPTION
(A) RETAINING ANGLES: MINIMUM 1-1/2" X 1-1/2" X 0.054 (16 GAUGE)
(B) CLEARANCE: 1/8" PER LIN. FOOT BOTH DIMENSIONS.
(C) STEEL SLEEVE
(D) APPROVED DAMPER FRAME
(E) SECURE RETAINING ANGLES TO SLEEVE ONLY, ON 8" CENTERS WITH:
1. 1/2" LONG WELDS OR,
2. 1/4" BOLTS AND NUTS OR,
3. NO. 10 STEEL SCREWS OR,
4. MINIMUM 3/16" STEEL RIVETS
(F) SECURE DAMPER TO SLEEVE IN 8" CENTERS WITH:
1. 1/2" LONG WELDS OR,
2. 1/4" BOLTS AND NUTS OR,
3. NO. 10 STEEL SCREWS OR,
4. MINIMUM 3/16" STEEL RIVETS
(G) SECURE DUCT TO SLEEVE WITH A VOLUTE CONNECTION AS SHOWN INSTALLATION INSTRUCTIONS GOVERN.



11 TYPICAL FIRE DAMPER-CURTAIN & BLADE STYLE DETAIL
No Scale



NOTES:
1. FUSIBLE LINK
2. CLEARANCE: 1/8" PER LIN. FOOT BOTH DIMENSIONS.
3. DAMPER FRAME
4. S-JOINT, SLEEVE TO DUCT
5. MOUNTING ANGLES
6. RETAINING ANGLES. MINIMUM 1-1/2" X 1-1/2" X 14 GA.
7. S-JOINT, SLEET TO DUCT (BREAK-AWAY CONNECTION)
8. CAULKING MATERIAL

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
MECHANICAL DETAILS

SHEET:
M5.02

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PACKAGED ROOFTOP UNIT SCHEDULE

				SUPPLY FAN SECTION							DX COOLING COIL SECTION						GAS HEATING SECTION					EXHAUST/RETURN FAN SECTION					FILTER SECTION	ELECTRICAL		
UNIT	MANUFACTURER	MODEL	WEIGHT	AIRFLOW (CFM)	DESIGN O.A. (CFM)	E.S.P. (IN.)	T.S.P. (IN.)	BHP	MOTOR HP	RPM	E.D.B./E.W.B. (°F)	L.D.B./L.W.B. (°F)	NET TOTAL CAPACITY (MBH)	NET SENSIBLE CAPACITY (MBH)	EER @ AHRI	# OF COMPRESSORS	TYPE	STAGES	INPUT/OUTPUT (MBH)	E.A.T. (°F)	L.A.T. (°F)	AIRFLOW (CFM)	E.S.P. (IN.)	BHP	MOTOR HP	RPM	TYPE	VOLTAGE/PHASE	MCA	MOCP
RTU-1	TRANE	SEHPF754N	11,500	20,000	6,000	3.0	5.7	43	50	1,100	81/67	59/55	807	520	10.2	4	NG	MODULATING	850/689	43	57	20,000	1.5	10	15	732	MERV-13	480/3	230	250
RTU-2	TRANE	SEHPF754N	11,500	20,000	6,000	3.0	5.7	43	50	1,100	81/67	59/55	807	520	10.2	4	NG	MODULATING	850/689	43	57	20,000	1.5	10	15	732	MERV-13	480/3	230	250
RTU-3	TRANE	SEHPF754N	11,500	18,000	5,400	3.0	4.1	27	30	900	81/67	56/53	835	533	10.2	4	NG	MODULATING	850/689	43	57	18,000	1.5	6.6	7.5	800	MERV-13	480/3	194	225

NOTES:
1. PROVIDE UNIT WITH 100% DRYBULB ECONOMIZER, POWER EXHAUST FAN (100% EXHAUST WITH BUILDING PRESSURE), CONDENSER COIL GUARD & STANDARD PROTECTION FEATURES.
2. PROVIDE CURB ADAPTOR FOR INSTALLATION ON EXISTING ROOF CURB. PROVIDE 2" DEFLECTION VIBRATION ISOLATORS.
3. MOUNT UNIT IN PROPER STRUCTURAL LOCATION TO ENSURE SERVICE AND CIRCULATION CLEARANCES ARE COMPLIED WITH.
4. PROVIDE ACCESS TO COILS FOR SERVICE AND CLEANING. PROVIDE STAINLESS STEEL, POSITIVELY SLOPED DRAIN PAN WITH THE COOLING COIL WITH 3" CONDENSATE TRAP.
5. PROVIDE FACTORY START-UP.
6. INSTALL UNIT PER MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.
7. PROVIDE FUSED DISCONNECT.
8. PROVIDE DUCT DETECTOR FOR UNITS PER IMC FOR AUTOMATIC SHUT DOWN. DETECTORS PROVIDED AND WIRED BY ELECTRICAL, INSTALLED BY MECHANICAL.
9. PROVIDE 3" CONDENSATE P-TRAP. CONDENSATE TO DRAIN TO ROOF SURFACE.
10. PROVIDE 2" FILTER(S).
11. UNIT TO INCLUDE ONE (1)YEAR PARTS AND SERVICE WARRANTY AND FIVE (5) YEAR COMPRESSOR WARRANTY.
12. PROVIDE UNIT WITH VFD AND BYPASS FOR VAV OPERATION.
13. SUPPLY FAN TO OPERATE CONTINUOUSLY DURING OCCUPIED HOURS TO PROVIDE ADEQUATE VENTILATION.
14. SET MINIMUM OUTSIDE AIR DAMPER AS SPECIFIED ON SCHEDULE. OUTSIDE AIR DAMPER SHALL CLOSE DURING UN-OCCUPIED HOURS AND UNIT SHALL OPERATE AT NIGHT SETBACK CONTROL SET BY OWNER.
15. FIELD LABEL EACH UNIT.
16. UNIT REFRIGERANT TO BE FULLY CHARGED WHEN SHIPPED TO SITE - R-454B.
17. PROVIDE SPACE CARBON DIOXIDE SENSOR TO CONTROL VENTILATION DAMPER.
18. PROVIDE POWER EXHAUST ON UNITS. THE POWER EXHAUST SHALL BE A FACTORY SUPPLIED, FIELD INSTALLED POWER ASSEMBLY THAT SHALL ASSIST THE BAROMETRIC RELIEF DAMPER IN THE ECONOMIZER MODE.
19. GAS HEAT - INDIRECT - HEAT EXCHANGER, TYPE 321 STAINLESS STEEL WITH CONDENSATE DRAIN. FORCED DRAFT GAS BURNER CAPABLE OF CONTINUOUS MODULATION OR 20:1 TURNDOWN.
20. THE BURNER SHALL INCLUDE A MICROPROCESSOR BASED FLAME SAFEGUARD CONTROL, COMBUSTION PROVING SWITCH, PRE-PURGE TIMER AND SPARK IGNITION. THE GAS TRAIN SHALL INCLUDE REDUNDANT GAS VALVES, SHUTOFF COCK, PILOT GAS VALVE, PILOT PRESSURE REGULATOR, AND PILOT COCK. MINIMUM GAS PRESSURE 6" W.C. PROVIDE PRV.
21. UNITS SHALL BE PROVIDED WITH FACTORY SIDE SUPPLY AND RETURN DUCT CONNECTIONS TO MATCH EXISTING ROOF MOUNTED DUCTWORK LOCATIONS.

AIR CONDITIONING UNIT SCHEDULE

								ELECTRICAL		
UNIT TAG	MANUFACTURER	MODEL	CFM	TOTAL CAPACITY (MBH)	ESP (IN)	MOTOR HP	FILTER	MCA	MOCP	VOLTAGE/PHASE
AC-1	LIEBERT	MMD36E	1,250	33.8	0.3	0.5	MERV-8	5	15	480/3
AC-2	LIEBERT	MMD36E	1,250	33.8	0.3	0.5	MERV-8	5	15	480/3

NOTES:
1. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND STARTUP OF NEW AC UNIT. MOUNT UNIT IN PROPER STRUCTURAL LOCATION, AND PROVIDE ALL REQUIRED SERVICE AND OPERATIONAL CLEARANCES. COORDINATE MOUNTING WITH STRUCTURE AS REQUIRED.
2. PROVIDE WALL MOUNTED ELECTRONIC PROGRAMMABLE THERMOSTAT WITH FAN ON / AUTO SWITCHING, AND HIGH-MEDIUM-LOW FAN SPEEDS.
3. PROVIDE CONDENSATE PUMP AS REQUIRED.
4. PROVIDE WITH AIR DISTRIBUTION PLENUM.
5. PROVIDE FACTORY MOUNTED INTEGRAL DISCONNECT.

AIR COOLED CONDENSING UNIT SCHEDULE

						ELECTRICAL			
UNIT TAG	MANUFACTURER	MODEL	CAPACITY (MBH)	OUTDOOR AMBIENT	REFRIGERANT	MCA	MOCP	VOLTAGE/ PHASE	WEIGHT (LBS)
ACCU-1	LIEBERT	PFH037A	36	95	R-407C	10	15	480/3	250
ACCU-2	LIEBERT	PFH037A	36	95	R-407C	10	15	480/3	250

NOTES:
1. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND STARTUP OF NEW AC UNIT. MOUNT UNIT IN PROPER STRUCTURAL LOCATION, AND PROVIDE ALL REQUIRED SERVICE AND OPERATIONAL CLEARANCES. COORDINATE MOUNTING WITH STRUCTURE AS REQUIRED.
2. REFRIGERANT LINE SET SHALL BE SIZED BY THE MANUFACTURER.
3. REFRIGERANT TYPE SHALL BE R407C.
4. PROVIDE WIND BAFFLE FOR OUTDOOR UNIT.
5. PROVIDE FACTORY MOUNTED INTEGRAL DISCONNECT.

DUCTLESS MINI-SPLIT SYSTEM SCHEDULE

								ELECTRICAL		
UNIT TAG	MANUFACTURER	MODEL	LOCATION	COOLING CAPACITY (MBH)	UNIT TAG	MODEL	OUTDOOR AMBIENT TEMP (°F)	EFFICIENCY (SEER2)	MCA	MOCP	VOLTAGE/PHASE
MS-1	MITSUBISHI	MSZ-GX36NL	SEE PLANS	36	CU-1	MUZ-GX36NL	14	18.5	23	25	208/1
MS-2	MITSUBISHI	MSZ-GX36NL	SEE PLANS	36	CU-2	MUZ-GX36NL	14	18.5	23	25	208/1
MS-3	MITSUBISHI	MSZ-GX36NL	SEE PLANS	36	CU-3	MUZ-GX36NL	14	18.5	23	25	208/1
MS-4	MITSUBISHI	MSZ-GX36NL	SEE PLANS	36	CU-4	MUZ-GX36NL	14	18.5	23	25	208/1

NOTES:
1. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND STARTUP OF NEW AC UNIT. MOUNT UNIT IN PROPER STRUCTURAL LOCATION, AND PROVIDE ALL REQUIRED SERVICE AND OPERATIONAL CLEARANCES. COORDINATE MOUNTING WITH STRUCTURE AS REQUIRED.
2. PROVIDE WALL MOUNTED ELECTRONIC PROGRAMMABLE THERMOSTAT WITH FAN ON / AUTO SWITCHING, AND HIGH-MEDIUM-LOW FAN SPEEDS.
3. PROVIDE CONDENSATE PUMP AS REQUIRED.
4. SPLIT SYSTEMS SHALL HAVE A SINGLE POINT POWER CONNECTION. THE INDOOR UNIT SHALL BE POWERED AND CONTROLLED BY THE OUTDOOR UNIT. ELECTRICAL CONTRACTOR SHALL WIRE BETWEEN THE INDOOR AND OUTDOOR UNITS.
5. REFRIGERANT LINE SET SHALL BE SIZED BY THE MANUFACTURER.
6. REFRIGERANT TYPE SHALL BE R454B.
7. PROVIDE WIND BAFFLE FOR OUTDOOR UNIT FOR CONTINUOUS OPERATION DOWN TO -40°F.
8. PROVIDE FACTORY MOUNTED INTEGRAL DISCONNECT.

EXHAUST FAN SCHEDULE

											ELECTRICAL			
UNIT TAG	MANUFACTURER	MODEL	SERVES	AIRFLOW (CFM)	ESP (IN WG)	MOTOR BHP	MOTOR HP	FAN SPEED (RPM)	DRIVE TYPE	SOUND LEVEL (SONES)	MCA	MOCP	VOLTAGE/PHASE	SPECIFIC NOTES
EF-1	GREENHECK	G-090-VG	GENERAL EXHAUST	525	0.5	0.1	0.1	1,635	DIRECT	8.1	1.9	15	120/1	1
EF-2	GREENHECK	SP-LP0511	RR EXHAUST	80	0.1	.01	.01	773	DIRECT	0.7	0.4	15	120/1	2
EF-3	GREENHECK	CSP-A390-VG	ELEVATOR	230	0.5	0.25	0.25	1,273	DIRECT	2.3	1.9	15	120/1	
EF-4	GREENHECK	GB-160	RR EXHAUST	2,600	0.75	0.75	0.75	1,725	DIRECT	14.3	2.6	15	480/3	1
EF-5	GREENHECK	SQ-18-M2-VG	LOCKER EXHAUST	4,800	0.75	1.1	2	1,350	DIRECT	19.2	4	15	480/3	3,4

GENERAL NOTES:
1. ALL FANS UL LISTED.
2. PROVIDE DISCONNECT MEANS FOR SINGLE PHASE EQUIPMENT.
3. PROVIDE PRE-WIRED FUSED SAFETY DISCONNECT (UNLESS ALREADY INCLUDED WITH VFD) AND STARTER FOR ALL 3PH EQUIPMENT. PROVIDE 120V POWER FOR STARTER RELAY.
4. PROVIDE MOTOR COVER, OSHA BELT GUARD, ACCESS DOORS, AND INLET AND OUTLET SCREENS.
5. ALL BELT DRIVE FAN DATA ARE BASED ON MEDIUM BELT DRIVE LOSSES.
6. GRAVITY & MOTORIZED DAMPERS SHALL BE ACCESSIBLE AND CLEANABLE.
7. PROVIDE 14" INSULATED ROOF CURB FOR ROOF MOUNTED FANS. CURBS SHALL COMPENSATE FOR ROOF SLOPE.

SPECIFIC NOTES:
1. FAN TO RUN CONTINUOUSLY DURING OCCUPIED HOURS.
2. FAN TO BE INTERLOCKED WITH LIGHT SWITCH.
3. FAN TO BE ALL ALUMINIUM HOUSING.
4. CONTROL FRAN FROM HUMIDISTAT AND CO2 SENSOR. REFER TO SPECIFICATIONS FOR FURTHER CONTROL DETAILS.

ELECTRIC UNIT HEATER SCHEDULE

						ELECTRICAL		
UNIT TAG	MANUFACTURER	MODEL	MOUNTING TYPE	AIRFLOW (CFM)	POWER (KW)	TOTAL AMPS (A)	MOCP	VOLTAGE/PHASE
ECUH-1	MARKEL	6333D054833830D0F	SEE PLANS	250	5	7.8	15	480/3
EUH-1	MARKEL	P3P5105CA1N	HORIZONTAL	400	5	6.1	15	480/3

NOTES:
1. ARCHITECT SHALL SELECT FINISH.
2. PROVIDE FACTORY MOUNTED INTEGRAL DISCONNECT.
3. PROVIDE (INTEGRAL TAMPER-PROOF) THERMOSTAT.
4. PROVIDE (HORIZONTAL) WALL MOUNTING KIT.

ADD ALTERNATE #1: STORM SHELTER

AIR TO AIR ENERGY RECOVERY VENTILATOR SCHEDULE

			SUPPLY FAN					EXHAUST FAN					ELECTRICAL		
UNIT TAG	MANUFACTURER	MODEL	INTAKE FILTER	AIRFLOW (CFM)	ESP (IN WG)	MOTOR HP	DRIVE TYPE	RETURN/EXHAUST FILTER	AIRFLOW (CFM)	ESP (IN WG)	MOTOR HP	DRIVE TYPE	MCA	MOCP	VOLTAGE/PHASE
ERV-1	RENEWAIRE	HE10-JINH-S1SEE-DGNT	713	700	0.5	0.5	DIRECT	615	600	0.5	0.5	DIRECT	3.9	15	208/1

NOTES:
1. ERV TO OPERATE DURING STORM SHELTER CONDITIONS ONLY.
2. PROVIDE WITH ECM FANS.
3. PROVIDE WITH MOTORIZED DAMPERS ON THE OA/EA CONNECTIONS.
4. PROVIDE WALL MOUNTING BRACKETS FOR WALL INSTALLATION. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR MOUNTING.
5. PROVIDE FACTORY MOUNTED INTEGRAL DISCONNECT.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
MECHANICAL SCHEDULES

SHEET:
M6.01

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LOUVER SCHEDULE

UNIT TAG	MANUFACTURER	MODEL	UNIT SERVED	FACE VELOCITY (FPM)	AIRFLOW (CFM)	PRESSURE DROP (IN WC)	FREE AREA (SF)	LOUVER WIDTH (IN)	LOUVER HEIGHT (IN)	SPECIFIC NOTES
L-1	RUSKIN	XP500WD	ERV-1	1,000	700	0.1	0.7	30	18	1
L-2	RUSKIN	XP500WD	ERV-1	860	600	0.12	0.7	30	18	1
L-3	RUSKIN	ELF6375DX	EF-5	925	4,800	0.15	5.2	48	30	

GENERAL NOTES:
1. COORDINATE LOCATION WITH STRUCTURAL.
2. PROVIDE WITH ALUMINUM BIRD SCREEN.

NOTES:
1. LOUVERS ARE TORNADO RATED AND WIND DRIVEN RAIN RATED.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT TAG	MANUFACTURER	TYPE	MATERIAL	SYSTEM	FACE SIZE (INxIN)	MOUNTING TYPE	SPECIFIC NOTES
E1	TITUS	350FL	STEEL	EXHAUST	SEE PLANS	CEILING	
E2	TITUS	S8F	ALUMINUM	EXHAUST	SEE PLANS	DUCT MOUNT	
E3	TITUS	SG-SD	STEEL	EXHAUST	SEE PLANS	CEILING	
E4	TITUS	PAR	STEEL	EXHAUST	24X24	CEILING	
R1	TITUS	50F	ALUMINUM	RETURN	SEE PLANS	CEILING	2
R2	TITUS	350FL	STEEL	RETURN	SEE PLANS	WALL	
S1	TITUS	OMNI	STEEL	SUPPLY	24X24	CEILING	
S2	TITUS	S300FL	ALUMINUM	SUPPLY	SEE PLANS	DUCT MOUNT	1
S3	TITUS	300FL	STEEL	SUPPLY	SEE PLANS	CEILING	
S4	TITUS	SG-SD	STEEL	SUPPLY	SEE PLANS	CEILING	
S5	TITUS	ML-39	ALUMINUM	SUPPLY	24"	CEILING	
S6	TITUS	ML-39	ALUMINUM	SUPPLY	48"	CEILING	

GENERAL FNOTES:
1. COORDINATE CEILING MOUNTED GRILLE/DIFFUSER BORDER TYPE WITH ARCHITECTURAL REFLECTED CEILING PLANS.
2. FINISH COLOR TO BE APPROVED BY OWNER AND ARCHITECT.
3. INSTALL BALANCING DAMPERS ABOVE ACCESSIBLE CEILING WHERE POSSIBLE. WHERE BALANCING DAMPER CANNOT BE INSTALLED ABOVE CEILING, PROVIDE REMOTE CONTROLLED ACTUATOR (GREENHECK RBDR-50 OR APPROVED EQUAL), WITH CONTROLLER MOUNTED SO AS TO BE OPERABLE FROM DIFFUSER FACE WHERE POSSIBLE.
4. BRANCH DUCTWORK SIZE SHALL MATCH DIFFUSER NECK SIZE.
5. ALL 12"x12" GRILLES/DIFFUSERS MOUNTED IN A GRID CEILING SHALL BE CENTERED IN THE CEILING TILE. CORNER MOUNTING AND METAL FILLER PANELS ARE NOT ALLOWED.
6. PROVIDE LINEAR SLOT DIFFUSER WITH MANUFACTURERS INSULATED PLENUM.
7. SPIRAL MOUNTED GRILLES MUST MATCH CURVATURE OF DUCT.

SPECIFIC NOTES:
1. DIFFUSER TO BE DUCT MOUNTED AT 22.5 DEGREE DOWN FROM HORIZONTAL.
2. PROVIDE 50F GRILLES WITH 1/2" x 1/2" x 1/2" ALUMINUM EGGCRATE GRID.

MINIMUM DIFFUSER NECK SIZE SCHEDULE

CFM RANGE	MIN. NECK SIZE
0-125	6"Ø
126-225	8"Ø
226-300	10"Ø
301-400	12"Ø
401-500	14"Ø

1. PROVIDE RUN-OUT DUCT OF SAME SIZE AS DIFFUSER NECK DIAMETER, UNLESS OTHERWISE NOTED.
2. INCREASE RUN-OUT DUCT SIZE BY ONE FULL SIZE WHEN LENGTH OF RUN-OUT DUCT FROM MAIN SUPPLY DUCT EXCEEDS 20'-0". PROVIDE TRANSITION AT THE DIFFUSER.

SINGLE DUCT VAV BOX WITH ELECTRIC REHEAT SCHEDULE

							ELECTRIC REHEAT COIL					MAXIMUM RADIATED	MAXIMUM DISCHARGE	ELECTRICAL		
UNIT TAG	MANUFACTURER	MODEL	INLET SIZE (IN)	OUTLET SIZE (INxIN)	COOLING AIRFLOW (CFM)	MINIMUM AIRFLOW (CFM)	HEATING AIRFLOW (CFM)	CAPACITY (KW)	EAT/LAT (°F/°F)	STAGES	APD (IN)	NC	NC	MCA	MOCP	VOLTAGE/ PHASE
VAV-1001	TRANE	VCEF	8	14X12	800	240	560	7	54/95	1	0.08	25	30	31	35	277/1
VAV-1041	TRANE	VCEF	8	14X12	800	240	560	6.5	54/90	1	0.08	25	30	29	30	277/1
VAV-1200	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-1201	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.05	25	30	12	15	277/1
VAV-1204	TRANE	VCEF	8	14X12	700	210	490	6.5	54/95	1	0.06	25	30	29	30	277/1
VAV-1207	TRANE	VCEF	6	10X10	350	110	240	3.5	54/95	1	0.1	25	30	15.8	20	277/1
VAV-1300	TRANE	VCEF	8	14X12	450	135	315	3.5	54/90	1	0.03	25	30	16	20	277/1
VAV-1302	TRANE	VCEF	8	14X12	570	180	420	5	54/90	1	0.04	25	30	24	25	277/1
VAV-1303	TRANE	VCEF	12	18X16	1,400	420	980	13	54/95	1	0.03	25	30	58	60	277/1
VAV-1304A	TRANE	VCEF	12	18X16	1,350	420	950	13	54/95	1	0.03	25	30	58	60	277/1
VAV-1304B	TRANE	VCEF	12	18X16	1,400	420	980	13	54/95	1	0.03	25	30	58	60	277/1
VAV-1306	TRANE	VCEF	6	10X10	400	120	280	3.5	54/95	1	0.05	25	30	15.8	20	277/1
VAV-1308	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.05	25	30	12	15	277/1
VAV-1309	TRANE	VCEF	10	16X14	1,175	350	820	11	54/95	1	0.03	25	30	49	50	277/1
VAV-1310	TRANE	VCEF	6	10X10	300	90	210	2.5	54/90	1	0.08	25	30	12	15	277/1
VAV-1313	TRANE	VCEF	8	14X12	800	240	560	6.5	54/90	1	0.08	25	30	29	30	277/1
VAV-1314	TRANE	VCEF	6	10X10	300	100	210	2.5	54/90	1	0.08	25	30	12	15	277/1
VAV-1315	TRANE	VCEF	8	14X12	675	205	475	6.5	54/95	1	0.06	25	30	29	30	277/1
VAV-1316	TRANE	VCEF	10	16X14	1,050	320	740	10	54/95	1	0.03	25	30	45	50	277/1
VAV-1317	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-1322	TRANE	VCEF	10	16X14	1,200	360	840	11	54/95	1	0.03	25	30	49	50	277/1
VAV-1323	TRANE	VCEF	8	14X12	610	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-1325	TRANE	VCEF	6	10X10	350	110	245	3.5	54/95	1	0.1	25	30	15.8	20	277/1
VAV-1327	TRANE	VCEF	8	14X12	550	165	385	5	54/90	1	0.04	25	30	24	25	277/1
VAV-1328	TRANE	VCEF	10	16X14	1,050	320	740	10	54/95	1	0.03	25	30	45	50	277/1
VAV-1330	TRANE	VCEF	10	16X14	1,125	340	790	11	54/95	1	0.03	25	30	49	50	277/1
VAV-2006	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-2101	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-2102	TRANE	VCEF	10	16X14	1,175	350	820	11	54/95	1	0.03	25	30	49	50	277/1
VAV-2103	TRANE	VCEF	10	16X14	1,050	320	740	10	54/95	1	0.03	25	30	45	50	277/1
VAV-2107	TRANE	VCEF	10	16X14	850	255	600	8	54/95	1	0.02	25	30	36	40	277/1
VAV-2108	TRANE	VCEF	8	14X12	450	150	350	4	54/90	1	0.03	25	30	18	20	277/1
VAV-2110	TRANE	VCEF	6	10X10	300	100	210	2.5	54/90	1	0.08	25	30	12	15	277/1
VAV-2113	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-2114	TRANE	VCEF	8	14X12	450	140	315	4	54/90	1	0.03	25	30	18	20	277/1
VAV-2200A	TRANE	VCEF	8	14X12	725	220	510	5.5	54/90	1	0.07	25	30	24	25	277/1
VAV-2200B	TRANE	VCEF	10	16X14	900	270	630	7	54/90	1	0.02	25	30	32	35	277/1
VAV-2200C	TRANE	VCEF	8	14X12	500	150	350	4.5	54/95	1	0.04	25	30	20	25	277/1
VAV-2201	TRANE	VCEF	8	14X12	700	210	490	6.5	54/95	1	0.06	25	30	29	30	277/1
VAV-2204	TRANE	VCEF	6	10X10	400	120	280	3.5	54/95	1	0.14	25	30	15.8	20	277/1
VAV-2207	TRANE	VCEF	8	14X12	800	240	560	7	54/95	1	0.08	25	30	31	35	277/1
VAV-2209	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-2210	TRANE	VCEF	12	18X16	1,400	420	980	13	54/95	1	0.03	25	30	58	60	277/1
VAV-2213	TRANE	VCEF	10	16X14	1,000	300	700	10	54/95	1	0.03	25	30	45	50	277/1
VAV-2215	TRANE	VCEF	8	14X12	675	200	475	6.5	54/95	1	0.05	25	30	29	30	277/1
VAV-2216	TRANE	VCEF	8	14X12	700	210	490	6.5	54/95	1	0.06	25	30	29	30	277/1
VAV-2217	TRANE	VCEF	6	10X10	400	120	280	3.5	54/90	1	0.14	25	30	15.8	20	277/1
VAV-2218	TRANE	VCEF	8	14X12	830	250	590	6.5	54/90	1	0.08	25	30	29	30	277/1
VAV-2220	TRANE	VCEF	6	10X10	300	100	210	3	54/90	1	0.05	25	30	13.5	15	277/1
VAV-3000A	TRANE	VCEF	8	14X12	800	240	560	6.5	54/90	1	0.05	25	30	29	30	277/1
VAV-3000B	TRANE	VCEF	8	14X12	800	240	560	6.5	54/90	1	0.05	25	30	29	30	277/1
VAV-3002	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-3100	TRANE	VCEF	6	10X10	400	120	280	3.5	54/90	1	0.14	25	30	15.8	20	277/1
VAV-3103	TRANE	VCEF	6	10X10	400	120	280	3.5	54/95	1	0.14	25	30	15.8	20	277/1
VAV-3104	TRANE	VCEF	6	10X10	325	100	230	3.5	54/95	1	0.09	25	30	15.8	20	277/1
VAV-3106	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.05	25	30	12	15	277/1
VAV-3109	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.05	25	30	12	15	277/1
VAV-3200A	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1
VAV-3200B	TRANE	VCEF	8	14X12	450	135	315	4	54/90	1	0.03	25	30	18	20	277/1
VAV-3201	TRANE	VCEF	8	14X12	800	240	560	7	54/95	1	0.08	25	30	31	35	277/1
VAV-3204	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.04	25	30	12	15	277/1
VAV-3205	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.05	25	30	12	15	277/1
VAV-3207	TRANE	VCEF	8	14X12	700	210	490	6.5	54/95	1	0.06	25	30	29	30	277/1
VAV-3208	TRANE	VCEF	8	14X12	710	210	480	5.5	54/90	1	0.05	25	30	24	25	277/1
VAV-3210	TRANE	VCEF	6	10X10	380	115	270	3.5	54/90	1	0.12	25	30	15.8	20	277/1
VAV-3301	TRANE	VCEF	10	16X14	1,200	360	840	11	54/95	1	0.04	25	30	49	50	277/1
VAV-3304	TRANE	VCEF	6	10X10	375	120	265	3.5	54/90	1	0.12	25	30	15.8	20	277/1
VAV-3307	TRANE	VCEF	10	16X14	1,120	340	790	10	54/95	1	0.03	25	30	45	50	277/1
VAV-3309	TRANE	VCEF	8	14X12	560	170	400	5.5	54/90	1	0.04	25	30	24	25	277/1
VAV-3402	TRANE	VCEF	6	10X10	250	80	175	2	54/90	1	0.06	25	30	12	15	277/1
VAV-3403	TRANE	VCEF	10	16X14	1,200	360	840	11	54/95	1	0.04	25	30	49	50	277/1
VAV-3501	TRANE	VCEF	8	14X12	700	210	490	5.5	54/90	1	0.12	25	30	24	25	277/1
VAV-3504	TRANE	VCEF	8	14X12	450	135	315	4.5	54/95	1	0.05	25	30	20	25	277/1
VAV-3600	TRANE	VCEF	10	16X14	1,080	330	770	10	54/95	1	0.03	25	30	45	50	277/1
VAV-3601A	TRANE	VCEF	12	18X16	1,500	500	1,000	13	54/95	1	0.04	25	30	58	60	277/1
VAV-3601B	TRANE	VCEF	12	18X16	1,350	405	950	13	54/95	1	0.03	25	30	58	60	277/1
VAV-3602A	TRANE	VCEF	8	14X12	450	135	315	4.5	54/95	1	0.03	25	30	20	25	277/1
VAV-3602B	TRANE	VCEF	10	16X14	850	255	600	8	54/95	1	0.02	25	30	36	40	277/1
VAV-3603	TRANE	VCEF	10	16X14	1,200	360	840	11	54/95	1	0.03	25	30	49	50	277/1
VAV-3606	TRANE	VCEF	8	14X12	600	180	420	5	54/90	1	0.05	25	30	24	25	277/1

NOTES:
1. COORDINATE RIGHT VS LEFT CONFIGURATION WITH SITE CONDITIONS TO MAINTAIN MANUFACTURER'S CLEARANCE REQUIREMENTS.
2. SOUND CRITERIA (NC) IS BASED ON A 1.0" PRESSURE DROP ACROSS THE ASSEMBLY.
3. MOUNT ALL VAV BOXES IN ACCESSIBLE CEILING LOCATION WITH 3 FEET CLEARANCE IN FRONT OF CONTROL PANEL. COORDINATE INSTALLATION WITH LIGHTING AND ALL OTHER TRADES.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102
DATE: 8/26/2026
SHEET SET: BID DOCUMENTS
SHEET NAME: MECHANICAL SCHEDULES
SHEET: M6.02

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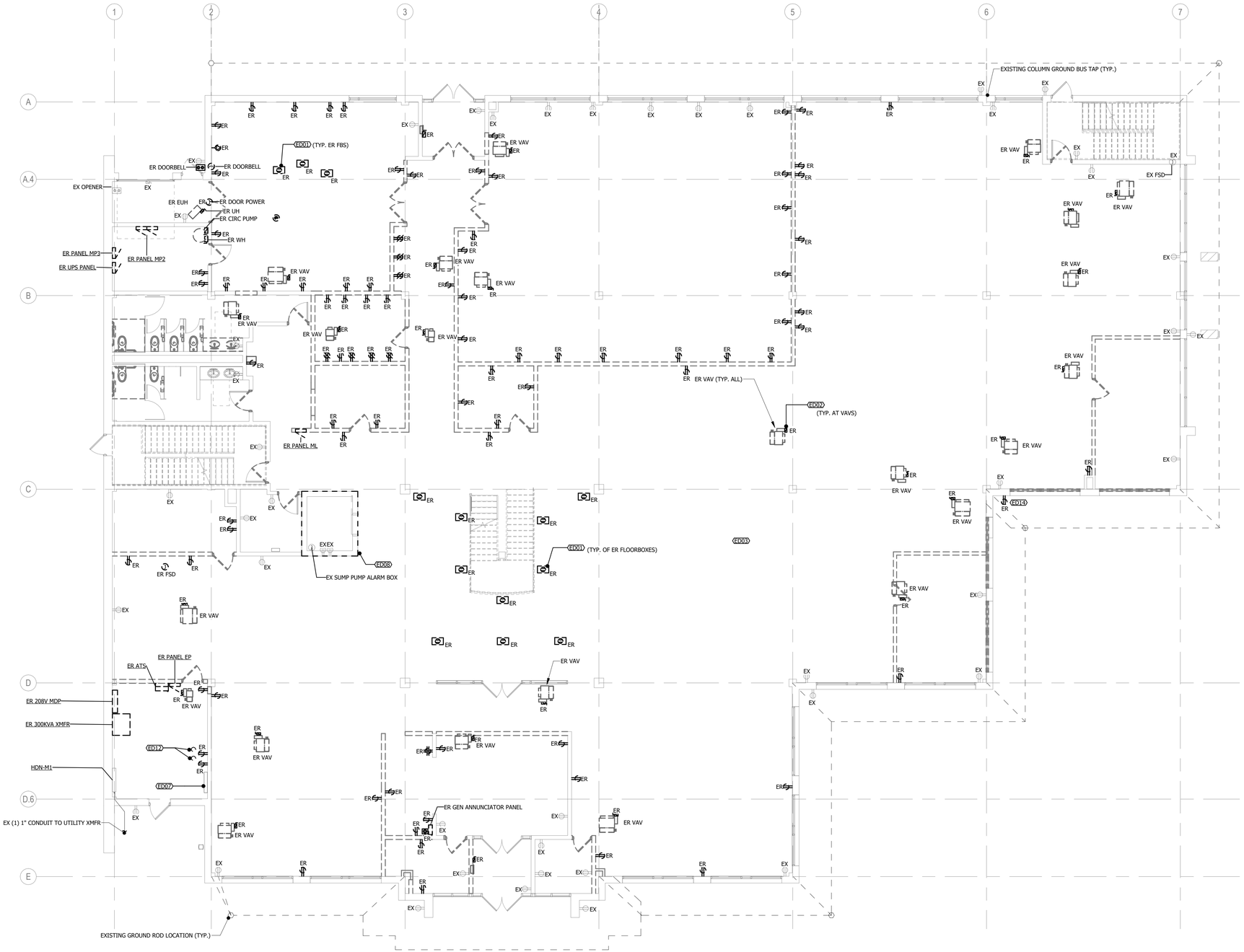

1 FIRST FLOOR DEMOLITION POWER PLAN
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL MECHANICAL EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING ELECTRICAL SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

H. EXTERIOR FREE-STANDING ELECTRICAL AND MECHANICAL DEVICES NOT BEING REUSED SHALL BE REMOVED UNDER BASE BID UNLESS OTHERWISE NOTED. PATCH OPENING TO MATCH SURROUNDING SURFACES.

I. **ELECTRICAL DEVICES INDICATED TO REMAIN (EX) SHALL BE REPLACED WITH A NEW DEVICE. VERIFY THE EXISTING BACKBOX, RACEWAY, AND CONDUCTORS ARE SUITABLE FOR REUSE. REPLACE ANY COMPONENTS THAT ARE DAMAGED OR DO NOT COMPLY WITH CURRENT CODE REQUIREMENTS. PULL NEW WIRE AND REGROUP RECEPTACLES AS INDICATED.**

J. **ELECTRICAL CONTRACTOR SHALL RECESS ALL DEVICES FLUSH IN EXISTING WALLS AND CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR.**

K. **ELECTRICAL CONTRACTOR TO DETERMINE NUMBER OF AVAILABLE BREAKER SPACE/CIRCUITS AVAILABLE AFTER DEMOLITION IS COMPLETED. CONTRACTOR SHALL INCLUDE IN THEIR BID TO REARRANGE/REWIRE EXISTING CIRCUITS TO ACCOMMODATE THE ADDITIONAL DEVICES REQUIRED FOR REMODELING. COORDINATE WITH DESIGN TEAM.**

L. **EXISTING CABLING LOCATED IN WALLS, WALKER DUCT AND CEILINGS SHALL BE REMOVED.**

REFERENCED NOTES

ED01 ELECTRICAL CONTRACTOR SHALL REMOVE ALL CONDUCTORS SERVING FLOORBOXES AND FLOORBOX HOUSING IN THIS SPACE. RACEWAY AND ASSOCIATED CONDUIT MAY BE ABANDONED WHERE NOT CONFLICTING WITH NEW CONSTRUCTION. COORDINATE CUTTING AND PATCHING WITH GENERAL CONTRACTOR TO MATCH EXISTING.

ED02 ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE ELECTRICAL DISCONNECT, CONDUCTORS, AND RACEWAY FOR MECHANICAL EQUIPMENT TO BE REMOVED. CONDUCTORS AND RACEWAY SHALL BE REMOVED BACK TO SOURCE PANEL. COORDINATE WITH MECHANICAL DRAWINGS.

ED03 REMOVE ALL LIGHTING, RECEPTACLES, LOW VOLTAGE DEVICES, AND OTHER ELECTRICAL DEVICES UNLESS NOTED OTHERWISE OR NECESSARY FOR THE OPERATION OF DEVICES OUTSIDE THE SCOPE OF REMODELING. REMOVE ASSOCIATED CONDUCTORS AND RACEWAY COMPLETELY.

ED07 MAINTAIN EXISTING PARAGON LIGHTING CONTROLS SYSTEM. MODIFY EXISTING CONDUIT AND WIRING AS REQUIRED TO REFEED LOADS.

ED08 MODIFY AND EXTEND EXISTING CONDUIT AND WIRING TO REFEED THE ELEVATOR AND ALL TTS ASSOCIATED ACCESSORIES AND COMPONENTS. COORDINATE WITH DESIGN TEAM AS REQUIRED.

ED12 REMOVE EXISTING FLOOR PENETRATION. SCAN SLAB PRIOR TO REMOVAL. DO NOT DAMAGE EXISTING REINFORCING. CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR. REFER TO DETAIL #2/ES.02 FOR ADDITIONAL INFORMATION.

ED14 BASE BID: REFER TO GENERAL NOTE J. STORM SHELTER ALTERNATE #1: DEVICES AND ALL ASSOCIATED COMPONENTS SHALL BE REMOVED DUE TO STORM SHELTER CONSTRUCTION.

NOTE:
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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: FIRST FLOOR ELECTRICAL DEMOLITION PLAN

SHEET: ED1.01

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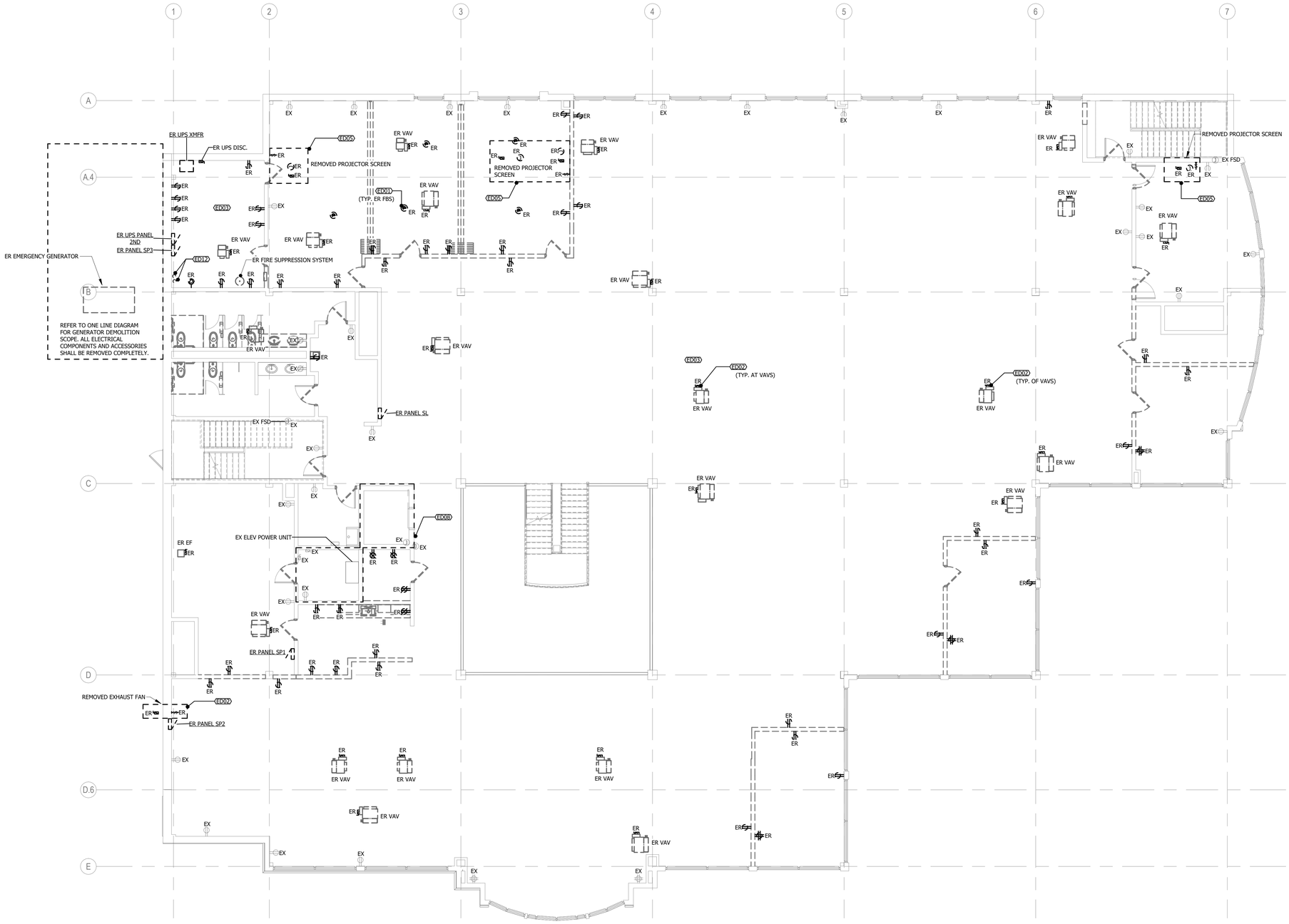

1 SECOND FLOOR DEMOLITION POWER PLAN
1/8" = 1'-0"

DEMOLITION GENERAL NOTES:

A. DEMOLITION DRAWINGS ARE BASED ON EXISTING AVAILABLE DRAWINGS AND CASUAL FIELD OBSERVATION. ELECTRICAL CONTRACTORS SHALL FIELD VERIFY THE SITE AND INCLUDE ALL REQUIRED DEMOLITION IN THE BID.

B. ALL REQUIRED DEMOLITION IS NOT INDICATED. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL MECHANICAL AND ELECTRICAL SYSTEMS (NOT TO BE REUSED OR EXTENDED) BE REMOVED. COORDINATE WITH ARCHITECTURAL DRAWINGS.

C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL MECHANICAL EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING ELECTRICAL SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

H. EXTERIOR FREE-STANDING ELECTRICAL AND MECHANICAL DEVICES NOT BEING REUSED SHALL BE REMOVED UNDER BASE BID UNLESS OTHERWISE NOTED. PATCH OPENING TO MATCH SURROUNDING SURFACES.

I. **ELECTRICAL DEVICES INDICATED TO REMAIN (EX) SHALL BE REPLACED WITH A NEW DEVICE. VERIFY THE EXISTING BACKBOX, RACEWAY, AND CONDUCTORS ARE SUITABLE FOR REUSE. REPLACE ANY COMPONENTS THAT ARE DAMAGED OR DO NOT COMPLY WITH CURRENT CODE REQUIREMENTS. PULL NEW WIRE AND REGROUP RECEPTACLES AS INDICATED.**

J. **ELECTRICAL CONTRACTOR SHALL RECESS ALL DEVICES FLUSH IN EXISTING WALLS AND CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR.**

K. **ELECTRICAL CONTRACTOR TO DETERMINE NUMBER OF AVAILABLE BREAKER SPACE/CIRCUITS AVAILABLE AFTER DEMOLITION IS COMPLETED. CONTRACTOR SHALL INCLUDE IN THEIR BID TO REARRANGE/REWIRE EXISTING CIRCUITS TO ACCOMMODATE THE ADDITIONAL DEVICES REQUIRED FOR REMODELING. COORDINATE WITH DESIGN TEAM.**

L. **EXISTING CABLING LOCATED IN WALLS, WALKER DUCT AND CEILINGS SHALL BE REMOVED.**

REFERENCED NOTES

ED01 ELECTRICAL CONTRACTOR SHALL REMOVE ALL CONDUCTORS SERVING FLOORBOXES AND FLOORBOX HOUSING IN THIS SPACE. RACEWAY AND ASSOCIATED CONDUIT MAY BE ABANDONED WHERE NOT CONFLICTING WITH NEW CONSTRUCTION. COORDINATE CUTTING AND PATCHING WITH GENERAL CONTRACTOR TO MATCH EXISTING.

ED02 ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE ELECTRICAL DISCONNECT, CONDUCTORS, AND RACEWAY FOR MECHANICAL EQUIPMENT TO BE REMOVED. CONDUCTORS AND RACEWAY SHALL BE REMOVED BACK TO SOURCE PANEL. COORDINATE WITH MECHANICAL DRAWINGS.

ED03 REMOVE ALL LIGHTING, RECEPTACLES, LOW VOLTAGE DEVICES, AND OTHER ELECTRICAL DEVICES UNLESS NOTED OTHERWISE OR NECESSARY FOR THE OPERATION OF DEVICES OUTSIDE THE SCOPE OF REMODELING. REMOVE ASSOCIATED CONDUCTORS AND RACEWAY COMPLETELY.

ED05 REMOVE EXISTING EQUIPMENT AND ALL ASSOCIATED ELECTRICAL COMPONENTS COMPLETELY BACK TO THE SOURCE PANEL.

ED08 MODIFY AND EXTEND EXISTING CONDUIT AND WIRING TO REFEED THE ELEVATOR AND ALL ITS ASSOCIATED ACCESSORIES AND COMPONENTS. COORDINATE WITH DESIGN TEAM AS REQUIRED.

ED12 REMOVE EXISTING FLOOR PENETRATION. SCAN SLAB PRIOR TO REMOVAL. DO NOT DAMAGE EXISTING REINFORCING. CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR. REFER TO DETAIL #2/E5.02 FOR ADDITIONAL INFORMATION.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR ELECTRICAL DEMOLITION PLAN

SHEET:
ED1.02

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24-187 - CITY HALL RELOCATION



DEMOLITION GENERAL NOTES:

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C. REFER TO SPECIFICATIONS AND OTHER SHEETS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

D. REMOVE ALL ELECTRICAL CONNECTIONS, WIRING, AND CONDUIT SERVING ALL MECHANICAL EQUIPMENT TO BE REMOVED.

E. MAINTAIN FIRE RATINGS OF AFFECTED WALLS AND FLOORS.

F. EXISTING ELECTRICAL SYSTEMS LOCATED IN WALLS AND CHASES NOT BEING REMOVED OR REUSED FOR NEW SYSTEMS MAY BE ABANDONED IN PLACE. CAP AT MAINS OR IN A CONCEALED LOCATION IF REQUIRED.

G. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS ON FLOOR CUTTING AND CEILING REMOVAL. CONTRACTOR SHALL COORDINATE WORK TO BE CONSISTENT WITH SCOPE OF GENERAL CONTRACTOR'S DEMOLITION.

H. EXTERIOR FREE-STANDING ELECTRICAL AND MECHANICAL DEVICES NOT BEING REUSED SHALL BE REMOVED UNDER BASE BID UNLESS OTHERWISE NOTED. PATCH OPENING TO MATCH SURROUNDING SURFACES.

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ED03 REMOVE ALL LIGHTING, RECEPTACLES, LOW VOLTAGE DEVICES, AND OTHER ELECTRICAL DEVICES UNLESS NOTED OTHERWISE OR NECESSARY FOR THE OPERATION OF DEVICES OUTSIDE THE SCOPE OF REMODELING. REMOVE ASSOCIATED CONDUCTORS AND RACEWAY COMPLETELY.

ED04 STRUCTURAL JOISTS TO BE REINFORCED BY ADDING NEW JHOISTS AT THIRD FLOOR. ALL EXISTING ELECTRICAL CONDUIT, JUNCTION BOXES, AND ASSOCIATED EQUIPMENT WITHIN INDICATED AREAS SHALL BE TEMPORARILY REWORKED, RELOCATED, OR REMOVED AS REQUIRED TO FACILITATE STRUCTURAL WORK. COORDINATE WITH STRUCTURAL AND ELECTRICAL TRADES PRIOR TO INSTALLATION.

ED05 REMOVE EXISTING EQUIPMENT AND ALL ASSOCIATED ELECTRICAL COMPONENTS COMPLETELY BACK TO THE SOURCE PANEL.

ED08 MODIFY AND EXTEND EXISTING CONDUIT AND WIRING TO REFEED THE ELEVATOR AND ALL ITS ASSOCIATED ACCESSORIES AND COMPONENTS. COORDINATE WITH DESIGN TEAM AS REQUIRED.

ED11 REMOVE EXISTING FLOOR PENETRATION. SCAN SLAB PRIOR TO REMOVAL. DO NOT DAMAGE EXISTING REINFORCING. CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR. ELECTRICAL EQUIPMENT AND ALL ASSOCIATED COMPONENTS SHALL BE REMOVED ENTIRELY. REFER TO DETAIL #1/E5.02 FOR ADDITIONAL INFORMATION.

ED13 PROVIDE NEW GFCI RECEPTACLE TO REPLACE EXISTING DEVICE IN SAME LOCATION.

1 THIRD FLOOR DEMOLITION POWER PLAN
1/8" = 1'-0"

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR
ELECTRICAL
DEMOLITION PLAN

SHEET:
ED1.03

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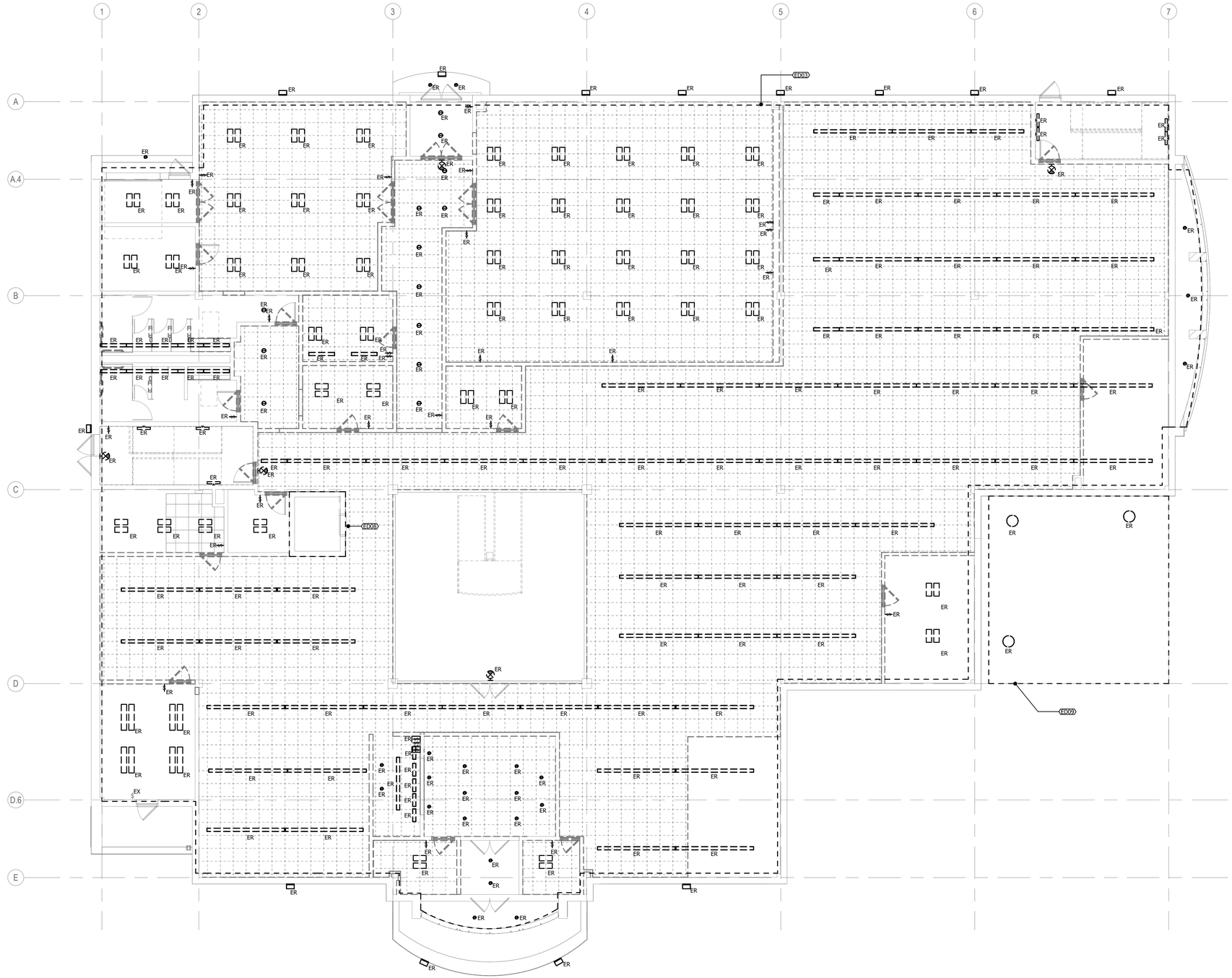

1 FIRST FLOOR LIGHTING DEMOLITION PLAN
1/8" = 1'-0"

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L. **EXISTING CABLING LOCATED IN WALLS, WALKER DUCT AND CEILINGS SHALL BE REMOVED.**

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ED08 MODIFY AND EXTEND EXISTING CONDUIT AND WIRING TO REFEED THE ELEVATOR AND ALL ITS ASSOCIATED ACCESSORIES AND COMPONENTS. COORDINATE WITH DESIGN TEAM AS REQUIRED.

ED09 BASE BID: EXISTING IN GROUND FIXTURES SHALL REMAIN. STORM SHELTER ALTERNATE #1: IN GROUND FIXTURES SHALL BE REMOVED COMPLETELY.

NOTE:
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SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR LIGHTING DEMOLITION PLAN

SHEET:
ED2.01

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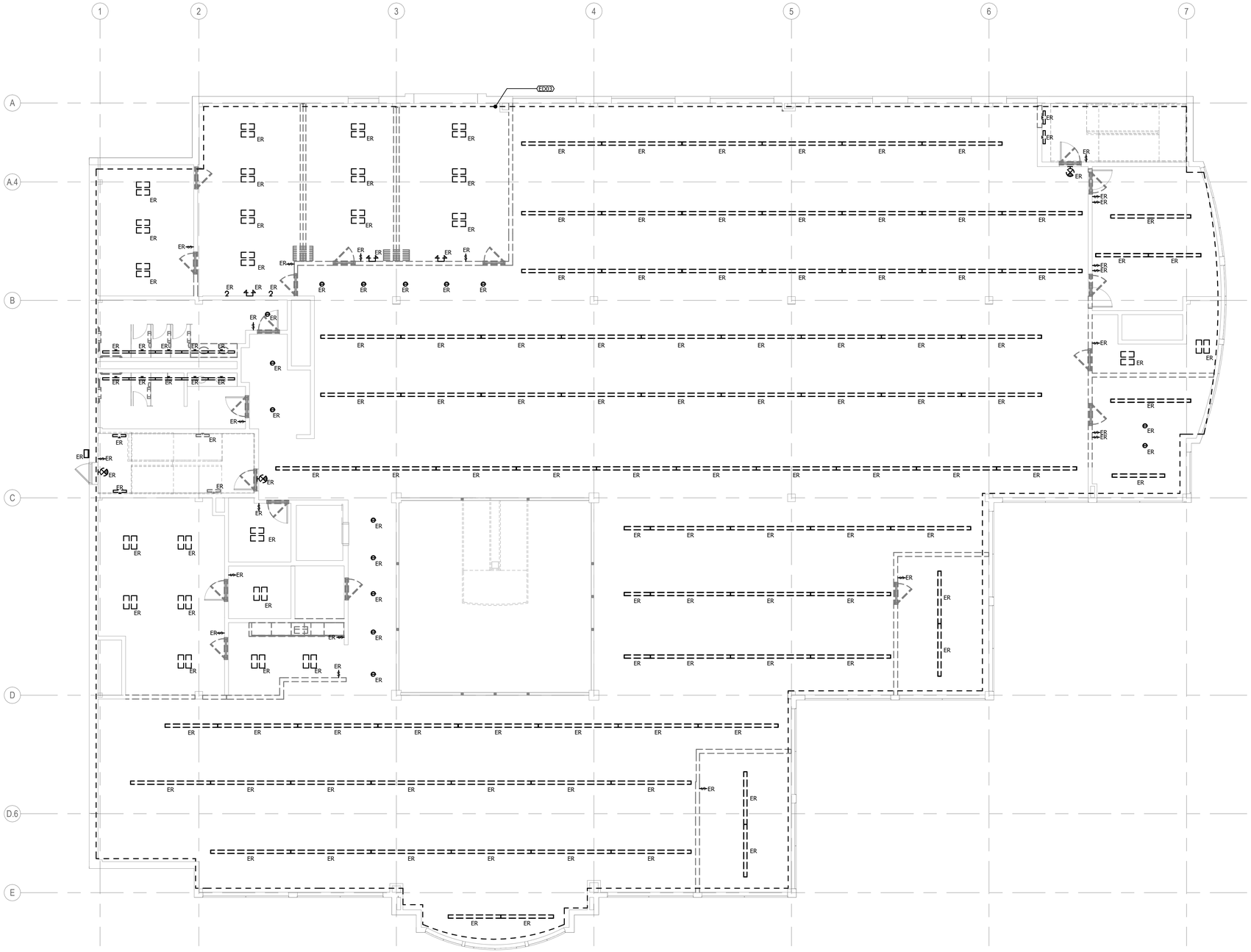

1 SECOND FLOOR LIGHTING DEMOLITION PLAN
1/8" = 1'-0"

DEMOLITION GENERAL NOTES:

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PROJECT NO:
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SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR LIGHTING DEMOLITION PLAN

SHEET:
ED2.02

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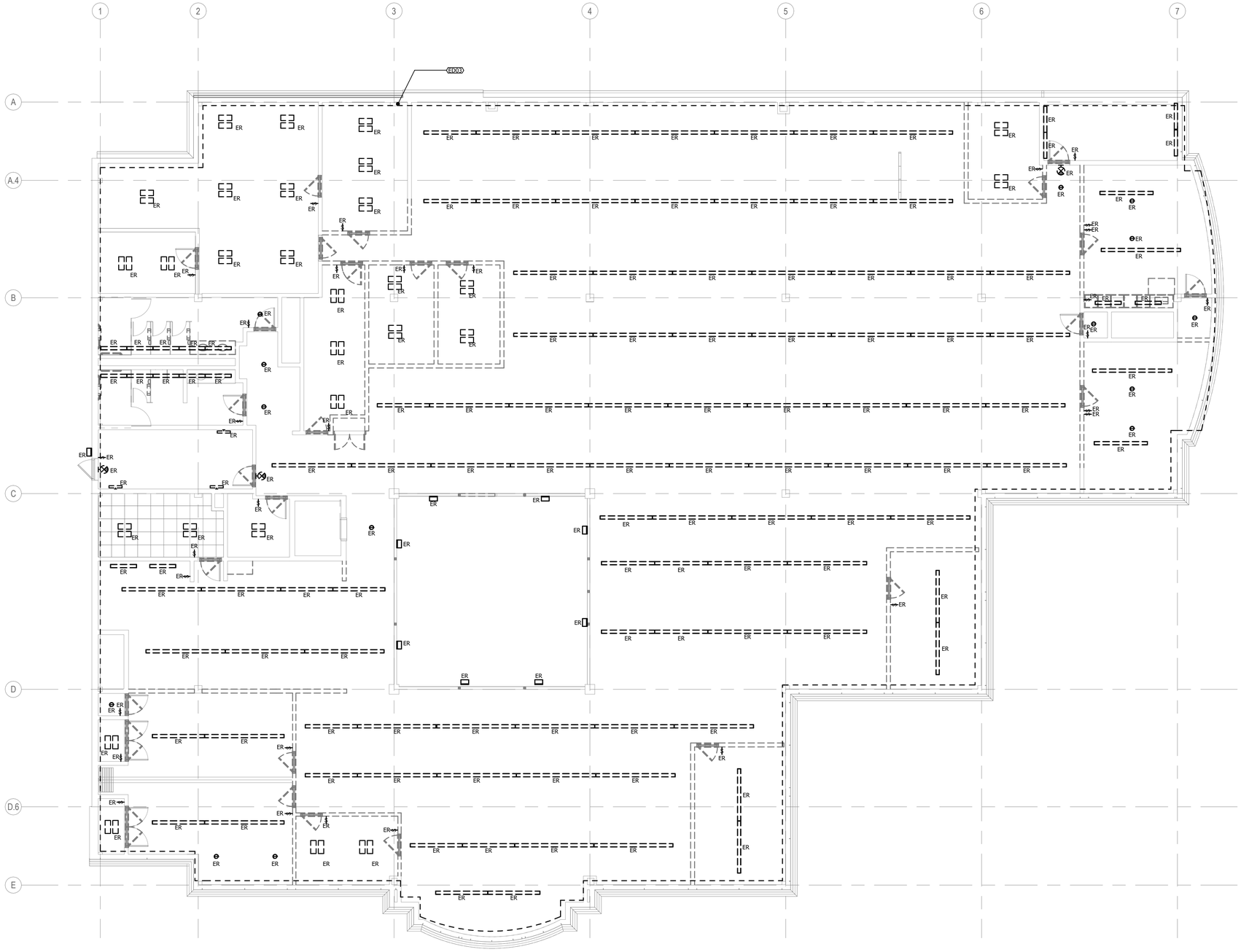

1 THIRD FLOOR LIGHTING DEMOLITION PLAN
1/8" = 1'-0"

DEMOLITION GENERAL NOTES:

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SHEET:
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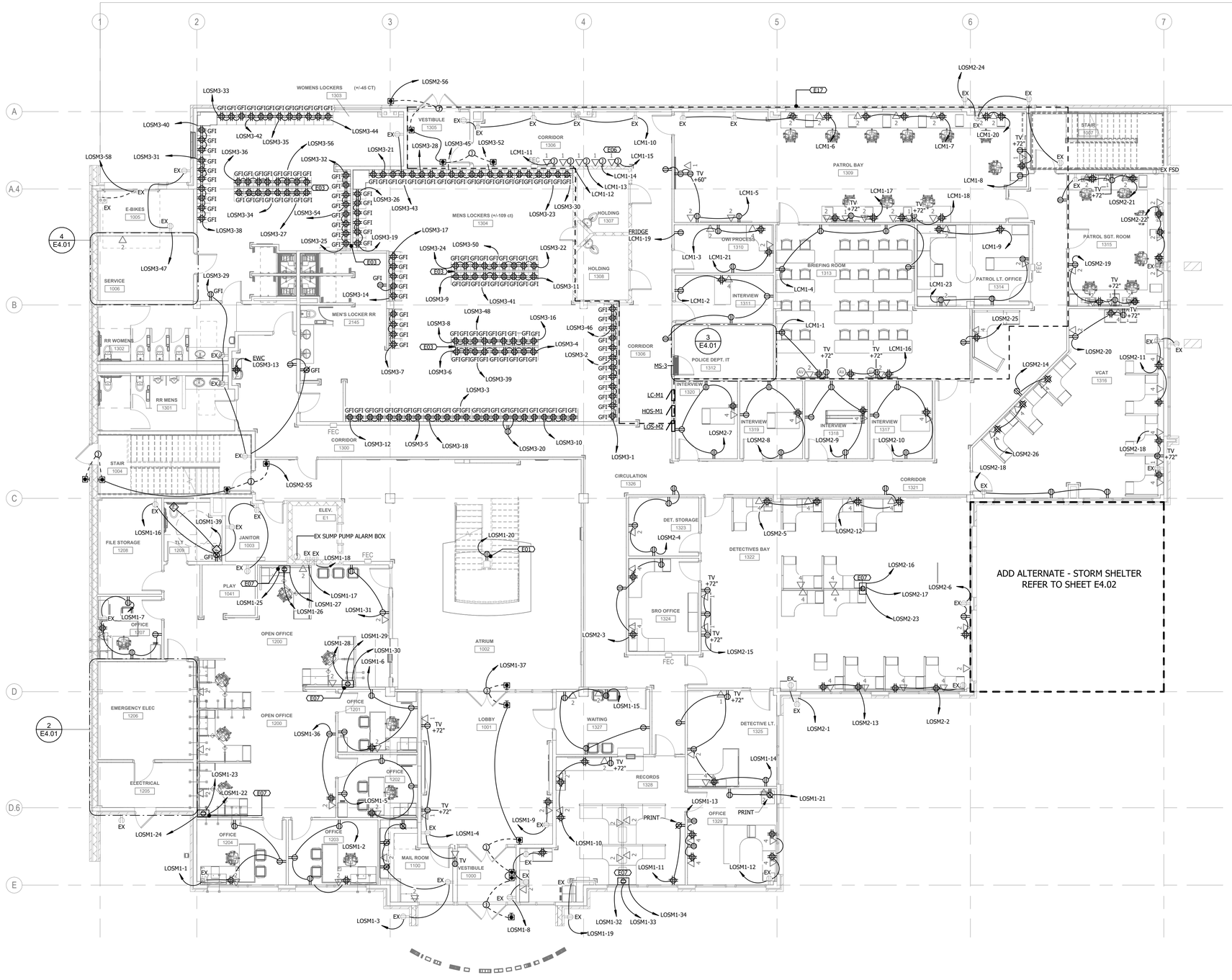

1 FIRST FLOOR POWER PLAN
1/8" = 1'-0"

N

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.

C. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

D. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.

E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

G. PRIOR TO ROUGH-IN, COORDINATE ALL WALL DEVICES WITH FINAL CASEWORK ELEVATIONS AND OTHER TRADES. CONFLICTS SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

H. ALL FLOOR BOXES SHALL HAVE THEIR EXACT ROUGH-IN LOCATION DETERMINED BY DESIGN TEAM THROUGH DIMENSIONED DRAWINGS SIGNED BY OWNER PRIOR TO ROUGH-IN. LOCATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY.

I. PROVIDE AN ADDITIONAL 20A-1P BREAKER IN LOCAL PANEL FOR CONNECTION TO FIRE SMOKE DAMPERS (FSD). SEE HVAC PLANS FOR EXACT LOCATIONS. CLEARLY INDICATE ON AS-BUILT DRAWINGS.

J. IN ROOMS WHERE MULTIPLE COUNTER HEIGHTS EXIST, ALL ABOVE-COUNTER RECEPTACLE SHALL BE INSTALLED AT THE SAME HEIGHT ABOVE FLOOR. COORDINATE WITH DESIGN TEAM DURING CONSTRUCTION.

K. REFER TO T-SHEETS FOR ADDITIONAL ROUGH-IN INFORMATION. ALL AUDIO INPUTS SHALL BE ROUGHED IN ADJACENT TO RECEPTACLES SHOWN ON THIS PLAN UNLESS NOTED OTHERWISE.

L. DEVICES ON WALLS BELOW MODULAR FURNITURE SHALL BE MOUNTED CENTERED AT 10"A.F.F. VERIFY EXACT LOCATIONS WITH MODULAR FURNITURE SUPPLIER PRIOR TO ROUGH-IN.

M. ELECTRICAL CONTRACTOR SHALL PROVIDE TAMPER RESISTANT RECEPTACLES PER NEC 406.12.

N. REFER TO ARCHITECTURAL ELEVATIONS AND REFLECTED CEILING PLANS FOR SPECIFIC DEVICE ROUGH-IN AND PLACEMENT. ANY DEVIATIONS FROM THE ARCHITECTURAL ELEVATIONS AND RCP 'S SHALL BE REVIEWED AND APPROVED BY THE DESIGN TEAM PRIOR TO ROUGH-IN. IF A DEVICE IS REQUIRED PER SPECIFICATION, REQUIRED FOR OPERATION, OR IS DIFFERENT IN CONFIGURATION THAN SHOWN ON ELEVATIONS AND RCP'S, CLARIFICATION AND DIRECTION MUST BE GIVEN BY THE DESIGN TEAM BEFORE ROUGH-IN. DEVIATIONS OR ADDITIONAL DEVICES NOT APPROVED PRIOR TO INSTALLATION SHALL BE CORRECTED AT CONTRACTORS EXPENSE. THIS INCLUDES BUT IS NOT LIMITED TO THERMOSTATS, CONTROL SYSTEM SENSORS, ELECTRICAL DEVICES, SWITCHES, DIMMERS, TECHNOLOGY DEVICES, A/V DEVICES, SPEAKERS, FIRE ALARM DEVICES, ETC.

O. CEILING CONTRACTOR SHALL PROVIDE AND INSTALL CEILING ACCESS PANELS FOR ACCESSIBILITY TO ELECTRICAL JUNCTION BOXES, PLUMBING VALVES, BALANCING DAMPERS, CIRCUIT SETTERS, ETC. WHERE ABSOLUTELY NECESSARY. LOCATIONS WILL NEED TO BE APPROVED AND COORDINATED WITH THE DESIGN TEAM PRIOR TO INSTALLATION.

P. **COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR DEVICES LABELED WITH "TV" WITH ARCHITECTURAL ELEVATIONS. LOCATE BEHIND TV/MONITOR TO COORDINATE WITH THE MOUNTING BRACKETS AND CONCEAL CONNECTIONS. COORDINATE WITH INSTALLER PRIOR TO ELECTRICAL ROUGH-IN.**

Q. **REFER TO SHEET E1.04 THROUGH SHEET E1.07 FOR MECHANICAL EQUIPMENT POWER AND ADDITIONAL INFORMATION.**

REFERENCED NOTES

E01 RECEPTACLE SHALL BE INSTALLED IN THE PLINTH. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

E03 ELECTRICAL CONTRACTOR SHALL ROUTE CONDUIT FROM ABOVE CEILING DOWN TO STUD WALL TO FEED DEVICES LOCATED WITHIN THE LOCKERS.

E06 BODY CAMERA CHARGING STATION. PROVIDE DATA AND ELECTRICAL CONNECTIONS AS REQUIRED. ELECTRICAL CONTRACTOR SHALL COORDINATE POWER AND DATA REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN. REFER TO SHEET T3.01 FOR ELEVATION. EACH ROW OF RECEPTACLES SHALL BE CIRCUITED TO A DEDICATED CIRCUIT. JUNCTION BOX IS SHOWN FOR CIRCUITING PURPOSES ONLY.

E07 FURNITURE FEED LOCATION SHOWN FOR REFERENCE ONLY. PROVIDE FACEPLATE WITH TERMINATIONS AT EACH WORKSTATION. ELECTRICAL CONTRACTOR AND STRUCTURED CABLING CONTRACTOR SHALL COORDINATE FINAL LOCATIONS, POWER AND DATA REQUIREMENTS, AND CONNECTION TYPES WITH THE CITY'S FURNITURE VENDOR DURING CONSTRUCTION AND PRIOR TO ROUGH-IN.

E17 CONTRACTOR SHALL NOTE THAT VESTIBULE 1305, HOLDING 1307, HOLDING 1308, OWI PROCESS 1310, INTERVIEW 1311, POLICE DEPT. IT 1312, PATROL BAY 1309, BRIEFING ROOM 1313, AND PATROL LT. OFFICE 1314, ARE CLASSIFIED AS CRITICAL OPERATIONS POWER SYSTEMS (COPS) UNDER ARTICLE 708 OF THE NEC. ALL EMERGENCY POWER, COMMUNICATION SYSTEMS, DOOR ACCESS SYSTEMS, EMERGENCY LIGHTING, AND FIRE ALARM SYSTEMS SERVING THESE SPACES SHALL BE ROUTED IN RMC OR IMC CONDUIT. BRANCH CIRCUITS SERVING RECEPTACLES AND LIGHTING NOT IN THE AREAS LISTED SHALL BE ROUTED IN RACEWAY PER THE SPECIFICATIONS. REFER TO ARTICLE 708 FOR ALL ADDITIONAL REQUIREMENTS IN THESE SPACES.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR
ELECTRICAL PLAN

SHEET:
E1.01

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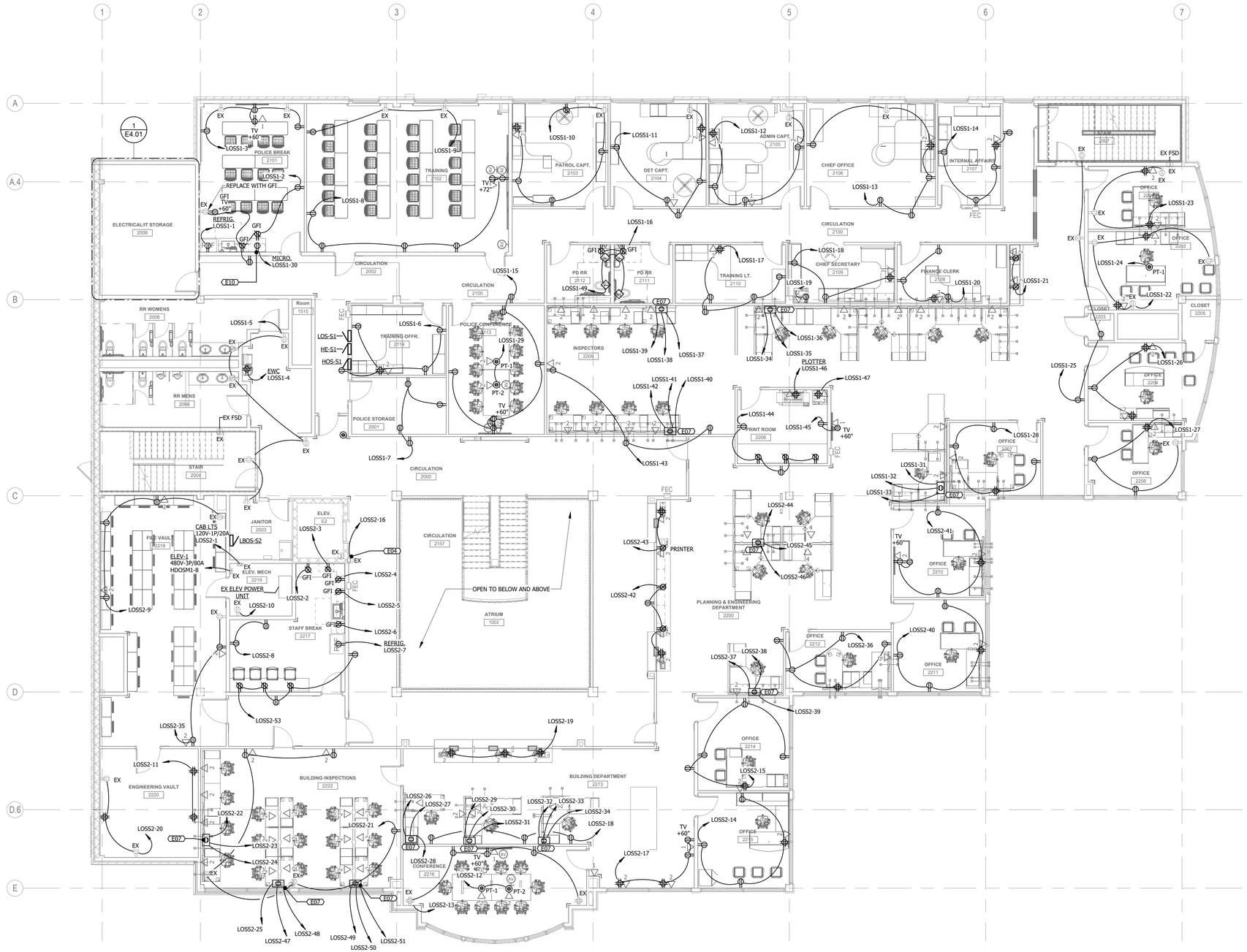

1 SECOND FLOOR POWER PLAN
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.

C. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

D. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.

E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

G. PRIOR TO ROUGH-IN, COORDINATE ALL WALL DEVICES WITH FINAL CASEWORK ELEVATIONS AND OTHER TRADES. CONFLICTS SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

H. ALL FLOOR BOXES SHALL HAVE THEIR EXACT ROUGH-IN LOCATION DETERMINED BY DESIGN TEAM THROUGH DIMENSIONED DRAWINGS SIGNED BY OWNER PRIOR TO ROUGH-IN. LOCATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY.

I. PROVIDE AN ADDITIONAL 20A-1P BREAKER IN LOCAL PANEL FOR CONNECTION TO FIRE SMOKE DAMPERS (FSD). SEE HVAC PLANS FOR EXACT LOCATIONS. CLEARLY INDICATE ON AS-BUILT DRAWINGS.

J. IN ROOMS WHERE MULTIPLE COUNTER HEIGHTS EXIST, ALL ABOVE-COUNTER RECEPTACLE SHALL BE INSTALLED AT THE SAME HEIGHT ABOVE FLOOR. COORDINATE WITH DESIGN TEAM DURING CONSTRUCTION.

K. REFER TO T-SHEETS FOR ADDITIONAL ROUGH-IN INFORMATION. ALL AUDIO INPUTS SHALL BE ROUGHED IN ADJACENT TO RECEPTACLES SHOWN ON THIS PLAN UNLESS NOTED OTHERWISE.

L. DEVICES ON WALLS BELOW MODULAR FURNITURE SHALL BE MOUNTED CENTERED AT 10"A.F.F. VERIFY EXACT LOCATIONS WITH MODULAR FURNITURE SUPPLIER PRIOR TO ROUGH-IN.

M. ELECTRICAL CONTRACTOR SHALL PROVIDE TAMPER RESISTANT RECEPTACLES PER NEC 406.12.

N. REFER TO ARCHITECTURAL ELEVATIONS AND REFLECTED CEILING PLANS FOR SPECIFIC DEVICE ROUGH-IN AND PLACEMENT. ANY DEVIATIONS FROM THE ARCHITECTURAL ELEVATIONS AND RCP'S SHALL BE REVIEWED AND APPROVED BY THE DESIGN TEAM PRIOR TO ROUGH-IN. IF A DEVICE IS REQUIRED PER SPECIFICATION, REQUIRED FOR OPERATION, OR IS DIFFERENT IN CONFIGURATION THAN SHOWN ON ELEVATIONS AND RCP'S, CLARIFICATION AND DIRECTION MUST BE GIVEN BY THE DESIGN TEAM BEFORE ROUGH-IN. DEVIATIONS OR ADDITIONAL DEVICES NOT APPROVED PRIOR TO INSTALLATION SHALL BE CORRECTED AT CONTRACTORS EXPENSE. THIS INCLUDES BUT IS NOT LIMITED TO THERMOSTATS, CONTROL SYSTEM SENSORS, ELECTRICAL DEVICES, SWITCHES, DIMMERS, TECHNOLOGY DEVICES, A/V DEVICES, SPEAKERS, FIRE ALARM DEVICES, ETC.

O. CEILING CONTRACTOR SHALL PROVIDE AND INSTALL CEILING ACCESS PANELS FOR ACCESSIBILITY TO ELECTRICAL JUNCTION BOXES, PLUMBING VALVES, BALANCING DAMPERS, CIRCUIT SETTERS, ETC. WHERE ABSOLUTELY NECESSARY. LOCATIONS WILL NEED TO BE APPROVED AND COORDINATED WITH THE DESIGN TEAM PRIOR TO INSTALLATION.

P. **COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR DEVICES LABELED WITH "TV" WITH ARCHITECTURAL ELEVATIONS. LOCATE BEHIND TV/MONITOR TO COORDINATE WITH THE MOUNTING BRACKETS AND CONCEAL CONNECTIONS. COORDINATE WITH INSTALLER PRIOR TO ELECTRICAL ROUGH-IN.**

Q. **REFER TO SHEET E1.04 THROUGH SHEET E1.07 FOR MECHANICAL EQUIPMENT POWER AND ADDITIONAL INFORMATION.**

REFERENCED NOTES

E04 EXISTING FIRE SHUTTER OPERATOR. EXTEND EXISTING CONDUIT AND WIRING TO NEW PANEL. PROVIDE RELAY IN FIRE ALARM CONTROL PANEL. COORDINATE WITH LOW VOLTAGE CONTRACTOR.

E07 FURNITURE FEED LOCATION SHOWN FOR REFERENCE ONLY. PROVIDE FACEPLATE WITH TERMINATIONS AT EACH WORKSTATION. ELECTRICAL CONTRACTOR AND STRUCTURED CABLING CONTRACTOR SHALL COORDINATE FINAL LOCATIONS, POWER AND DATA REQUIREMENTS, AND CONNECTION TYPES WITH THE CITY'S FURNITURE VENDOR DURING CONSTRUCTION AND PRIOR TO ROUGH-IN.

E10 COORDINATE LOCATION OF RECEPTACLE SERVING THE MICROWAVE WITH ARCHITECTURAL ELEVATIONS. RECEPTACLE SHALL BE LOCATED ADJACENT TO EQUIPMENT.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR ELECTRICAL PLAN

SHEET:
E1.02

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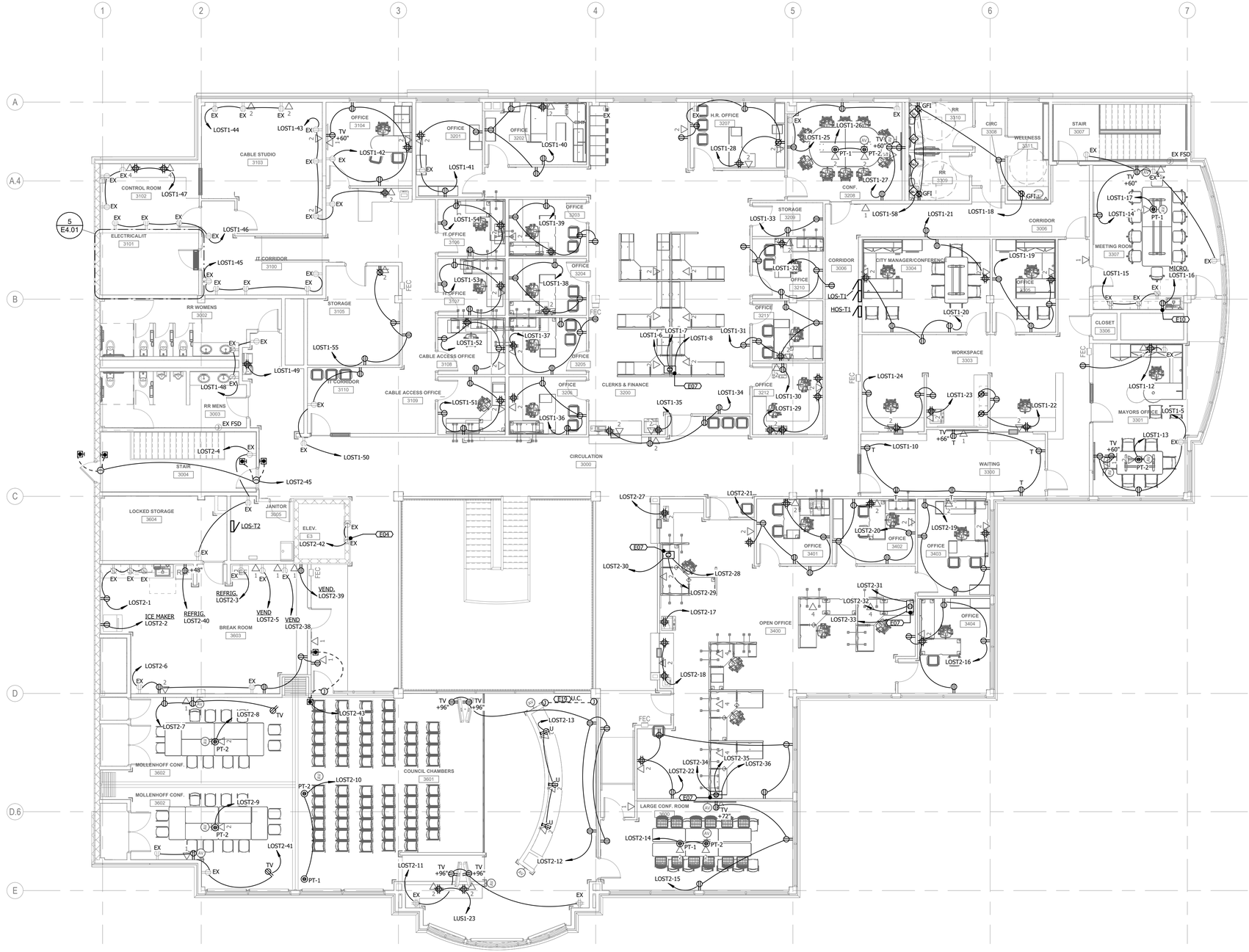

1 THIRD FLOOR POWER PLAN
1/8" = 1'-0"

N

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.

C. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

D. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.

E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

G. PRIOR TO ROUGH-IN, COORDINATE ALL WALL DEVICES WITH FINAL CASEWORK ELEVATIONS AND OTHER TRADES. CONFLICTS SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

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K. REFER TO T-SHEETS FOR ADDITIONAL ROUGH-IN INFORMATION. ALL AUDIO INPUTS SHALL BE ROUGHED IN ADJACENT TO RECEPTACLES SHOWN ON THIS PLAN UNLESS NOTED OTHERWISE.

L. DEVICES ON WALLS BELOW MODULAR FURNITURE SHALL BE MOUNTED CENTERED AT 10"A.F.F. VERIFY EXACT LOCATIONS WITH MODULAR FURNITURE SUPPLIER PRIOR TO ROUGH-IN.

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P. **COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR DEVICES LABELED WITH "TV" WITH ARCHITECTURAL ELEVATIONS. LOCATE BEHIND TV/MONITOR TO COORDINATE WITH THE MOUNTING BRACKETS AND CONCEAL CONNECTIONS. COORDINATE WITH INSTALLER PRIOR TO ELECTRICAL ROUGH-IN.**

Q. **REFER TO SHEET E1.04 THROUGH SHEET E1.07 FOR MECHANICAL EQUIPMENT POWER AND ADDITIONAL INFORMATION.**

REFERENCED NOTES

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E10 COORDINATE LOCATION OF RECEPTACLE SERVING THE MICROWAVE WITH ARCHITECTURAL ELEVATIONS. RECEPTACLE SHALL BE LOCATED ADJACENT TO EQUIPMENT.

E19 POWER AND DATA CONDUIT PATHWAYS SHALL BE ROUTED UNDER FLOOR TO SERVE DEVICES.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR
ELECTRICAL PLAN

SHEET:
E1.03

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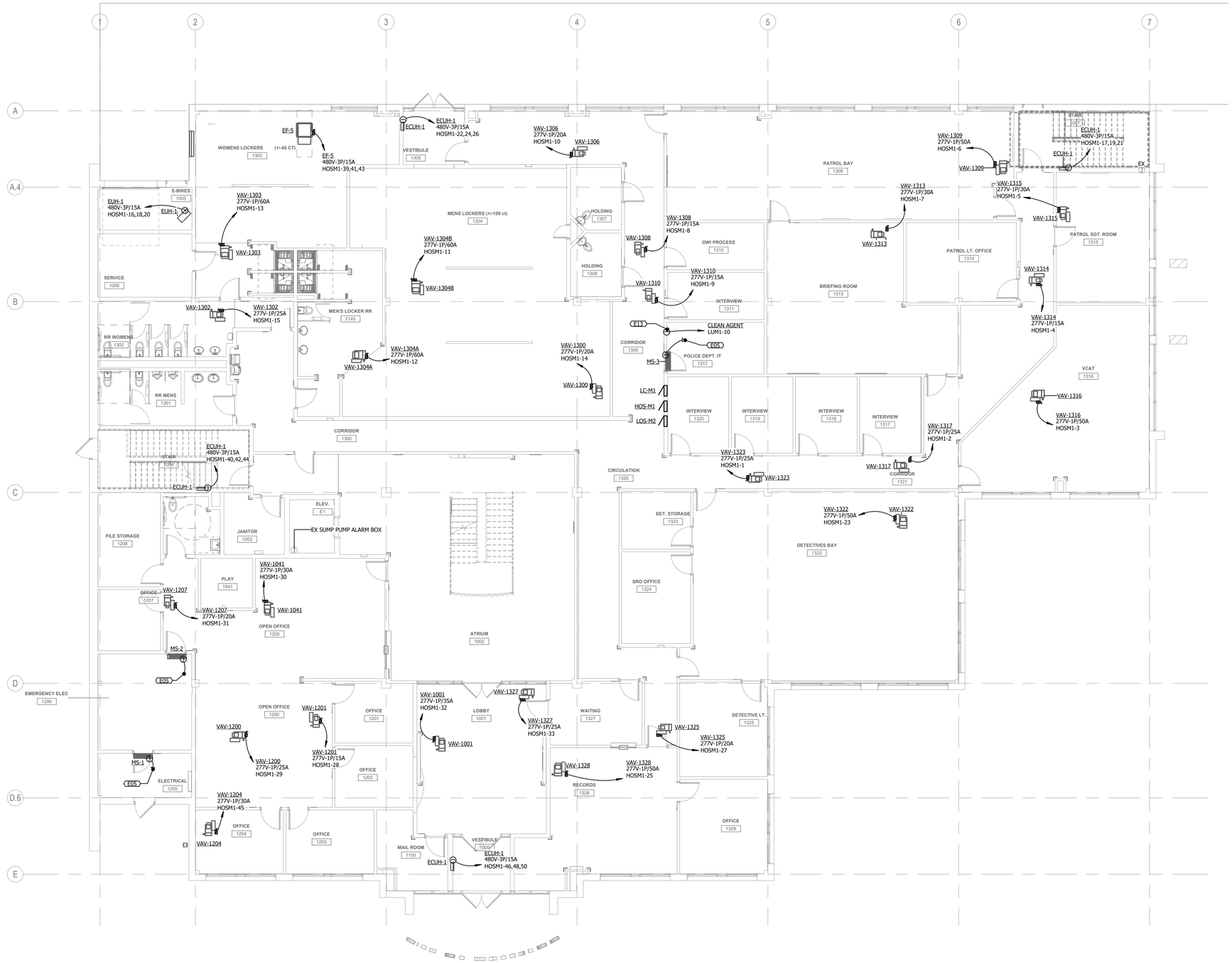

1 FIRST FLOOR POWER PLAN - MECHANICAL EQUIPMENT
1/8" = 1'-0"

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.

C. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

D. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.

E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

G. PROVIDE AN ADDITIONAL 20A-1P BREAKER IN LOCAL PANEL FOR CONNECTION TO FIRE SMOKE DAMPERS (FSD). SEE HVAC PLANS FOR EXACT LOCATIONS. CLEARLY INDICATE ON AS-BUILT DRAWINGS.

H. REFER TO T-SHEETS FOR ADDITIONAL ROUGH-IN INFORMATION. ALL AUDIO INPUTS SHALL BE ROUGHED IN ADJACENT TO RECEPTACLES SHOWN ON THIS PLAN UNLESS NOTED OTHERWISE.

I. CEILING CONTRACTOR SHALL PROVIDE AND INSTALL CEILING ACCESS PANELS FOR ACCESSIBILITY TO ELECTRICAL JUNCTION BOXES, PLUMBING VALVES, BALANCING DAMPERS, CIRCUIT SETTERS, ETC. WHERE ABSOLUTELY NECESSARY. LOCATIONS WILL NEED TO BE APPROVED AND COORDINATED WITH THE DESIGN TEAM PRIOR TO INSTALLATION.

REFERENCED NOTES

E05 PROVIDE A SINGLE POINT POWER CONNECTION BETWEEN INDOOR UNIT AND OUTDOOR UNIT. ALL INTERCONNECTED WIRING SHALL BE BY ELECTRICAL CONTRACTOR. COORDINATE WITH MECHANICAL CONTRACTOR.

E13 PROVIDE ALL REQUIRED SMOKE DETECTION, CONDUIT, WIRING AND ACCESSORIES FOR POWER AND CONTROL FOR A COMPLETE WORKING FIRE SUPPRESSION SYSTEM. COORDINATE WORK WITH THE ELECTRICAL CONTRACTOR AND ALL TRADES. CONNECT TO EXISTING FIRE ALARM CONTROL PANEL. ALL COSTS ASSOCIATED WITH THE ABOVE MENTIONED WORK SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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100 E 4TH ST,
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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR ELECTRICAL PLAN - MECHANICAL EQUIPMENT

SHEET:
E1.04

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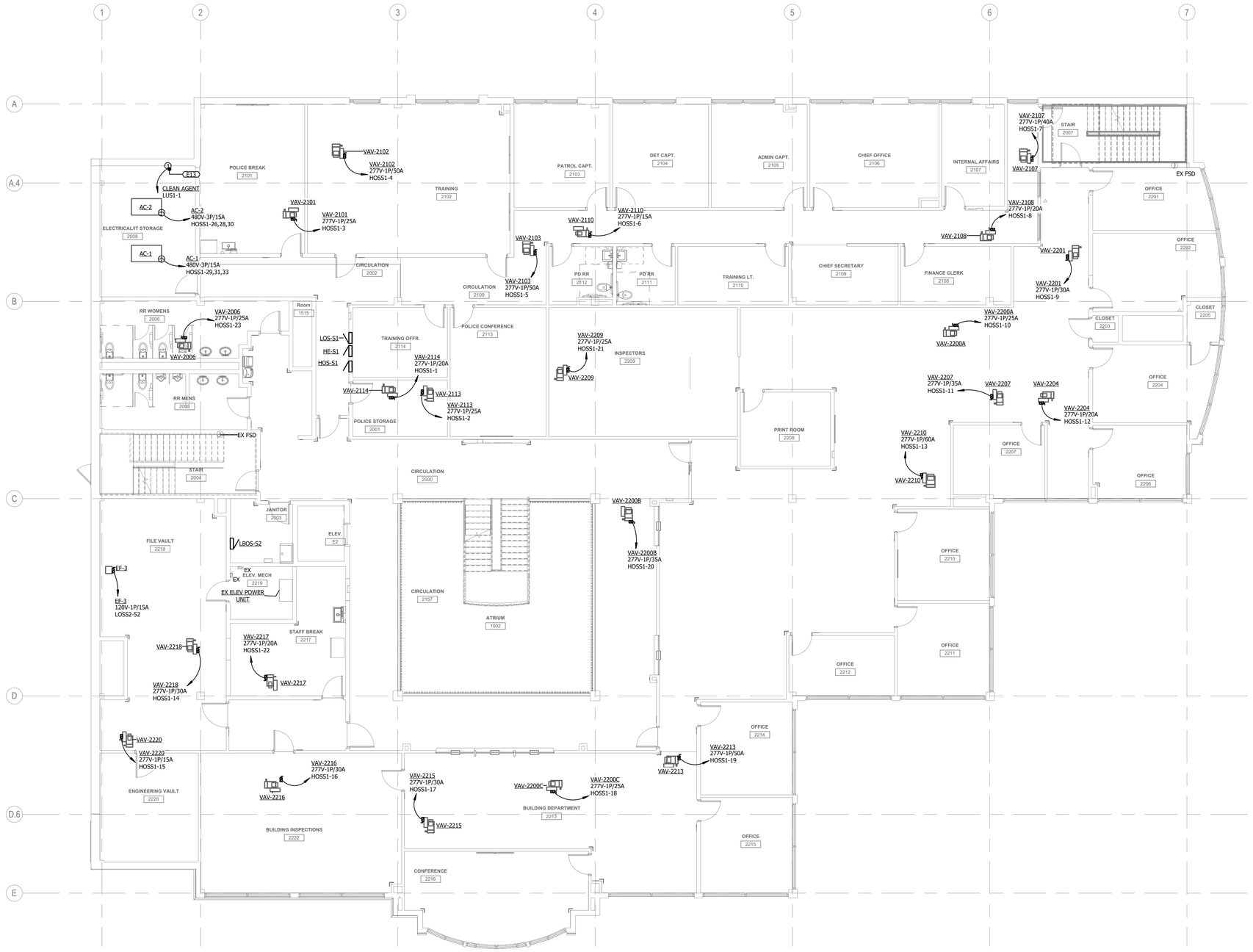

1 SECOND FLOOR POWER PLAN - MECHANICAL EQUIPMENT
1/8" = 1'-0"

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.

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E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

G. PROVIDE AN ADDITIONAL 20A-1P BREAKER IN LOCAL PANEL FOR CONNECTION TO FIRE SMOKE DAMPERS (FSD). SEE HVAC PLANS FOR EXACT LOCATIONS. CLEARLY INDICATE ON AS-BUILT DRAWINGS.

H. REFER TO T-SHEETS FOR ADDITIONAL ROUGH-IN INFORMATION. ALL AUDIO INPUTS SHALL BE ROUGHED IN ADJACENT TO RECEPTACLES SHOWN ON THIS PLAN UNLESS NOTED OTHERWISE.

I. CEILING CONTRACTOR SHALL PROVIDE AND INSTALL CEILING ACCESS PANELS FOR ACCESSIBILITY TO ELECTRICAL JUNCTION BOXES, PLUMBING VALVES, BALANCING DAMPERS, CIRCUIT SETTERS, ETC. WHERE ABSOLUTELY NECESSARY. LOCATIONS WILL NEED TO BE APPROVED AND COORDINATED WITH THE DESIGN TEAM PRIOR TO INSTALLATION.

REFERENCED NOTES

E13 PROVIDE ALL REQUIRED SMOKE DETECTION, CONDUIT, WIRING AND ACCESSORIES FOR POWER AND CONTROL FOR A COMPLETE WORKING FIRE SUPPRESSION SYSTEM. COORDINATE WORK WITH THE ELECTRICAL CONTRACTOR AND ALL TRADES. CONNECT TO EXISTING FIRE ALARM CONTROL PANEL. ALL COSTS ASSOCIATED WITH THE ABOVE MENTIONED WORK SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.

NOTE:
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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR ELECTRICAL PLAN - MECHANICAL EQUIPMENT

SHEET:
E1.05

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1 THIRD FLOOR POWER PLAN - MECHANICAL EQUIPMENT
1/8" = 1'-0"

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

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REFERENCED NOTES

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E13 PROVIDE ALL REQUIRED SMOKE DETECTION, CONDUIT, WIRING AND ACCESSORIES FOR POWER AND CONTROL FOR A COMPLETE WORKING FIRE SUPPRESSION SYSTEM. COORDINATE WORK WITH THE ELECTRICAL CONTRACTOR AND ALL TRADES. CONNECT TO EXISTING FIRE ALARM CONTROL PANEL. ALL COSTS ASSOCIATED WITH THE ABOVE MENTIONED WORK SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.

NOTE:
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SHEET SET:
BID DOCUMENTS

SHEET NAME:
THIRD FLOOR ELECTRICAL PLAN - MECHANICAL EQUIPMENT

SHEET:
E1.06

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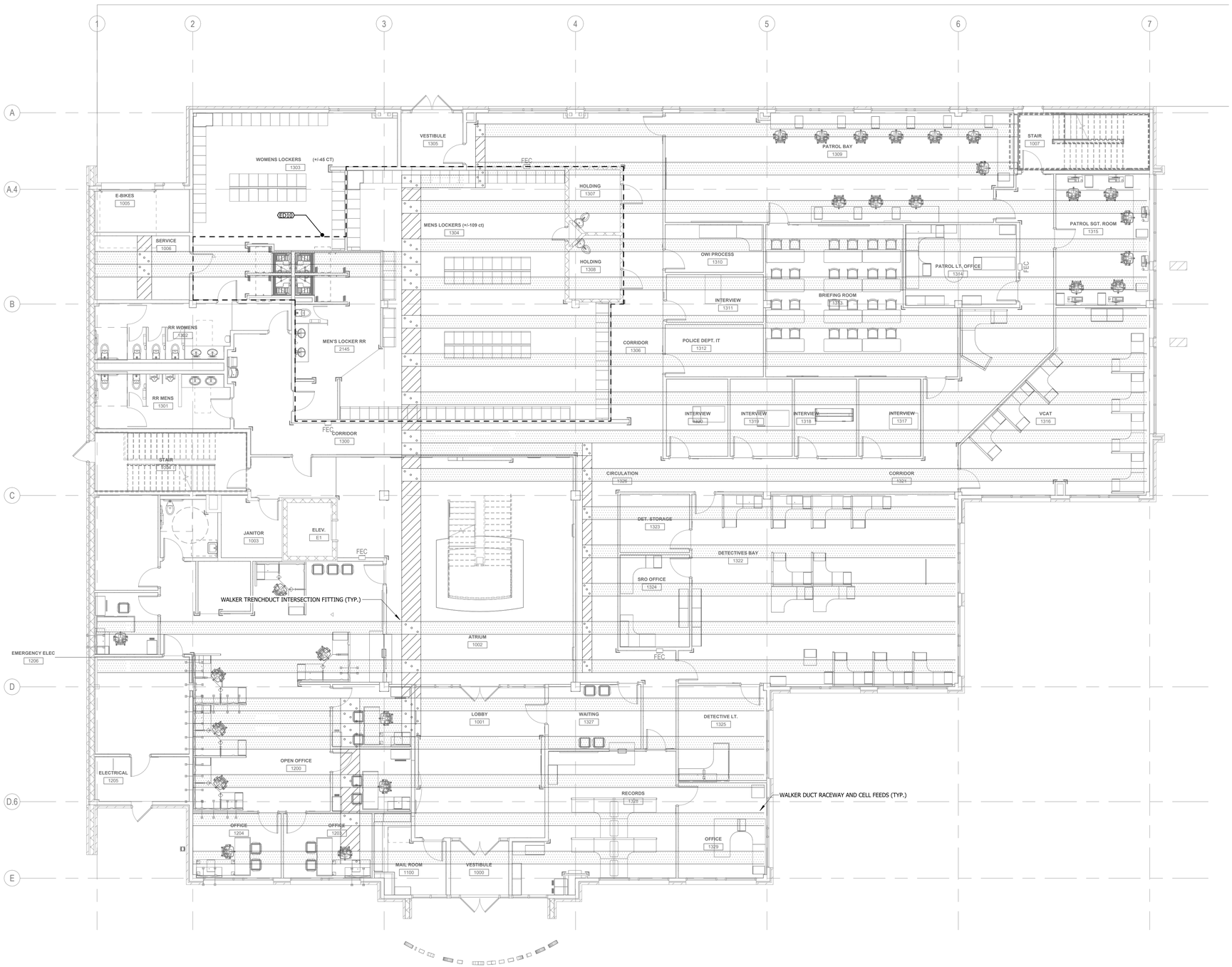
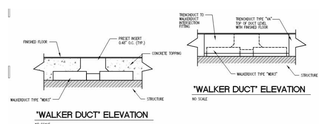


1 FIRST FLOOR POWER PLAN - EXISTING WALKER DUCT
1/8" = 1'-0"



2 WALKER DUCT CROSS SECTION
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

GENERAL NOTES:

A. ALL EXISTING WIRING LOCATED IN WALKER DUCT SYSTEM SHALL BE REMOVED COMPLETELY. EXISTING ACTIVATION LOCATIONS SHALL BE REMOVED. CUT AND PATCH TO MATCH EXISTING. FIELD VERIFY EXISTING LAYOUT.

REFERENCED NOTES

ED10 EXISTING WALKER DUCT SYSTEM SHALL BE REMOVED COMPLETELY WITHIN THESE BOUNDARIES. CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR.

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WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR ELECTRICAL PLAN - WALKER DUCT

SHEET:
E1.07

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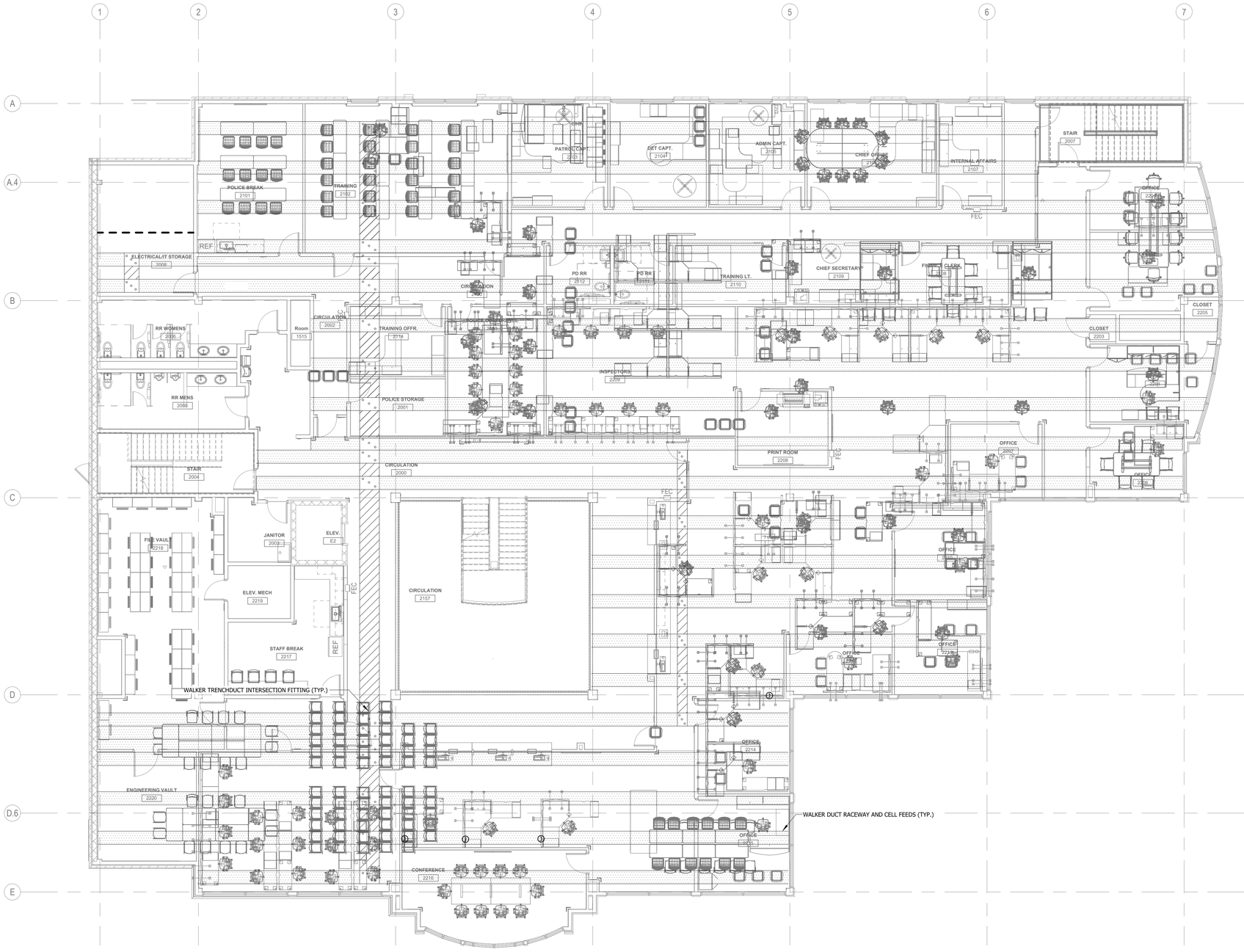

1 SECOND FLOOR POWER PLAN - WALKER DUCT
1/8" = 1'-0"

GENERAL NOTES:

A. ALL EXISTING WIRING LOCATED IN WALKER DUCT SYSTEM SHALL BE REMOVED COMPLETELY. EXISTING ACTIVATION LOCATIONS SHALL BE REMOVED, CUT AND PATCH TO MATCH EXISTING. FIELD VERIFY EXISTING LAYOUT.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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SHEET NAME:
SECOND FLOOR ELECTRICAL PLAN - WALKER DUCT

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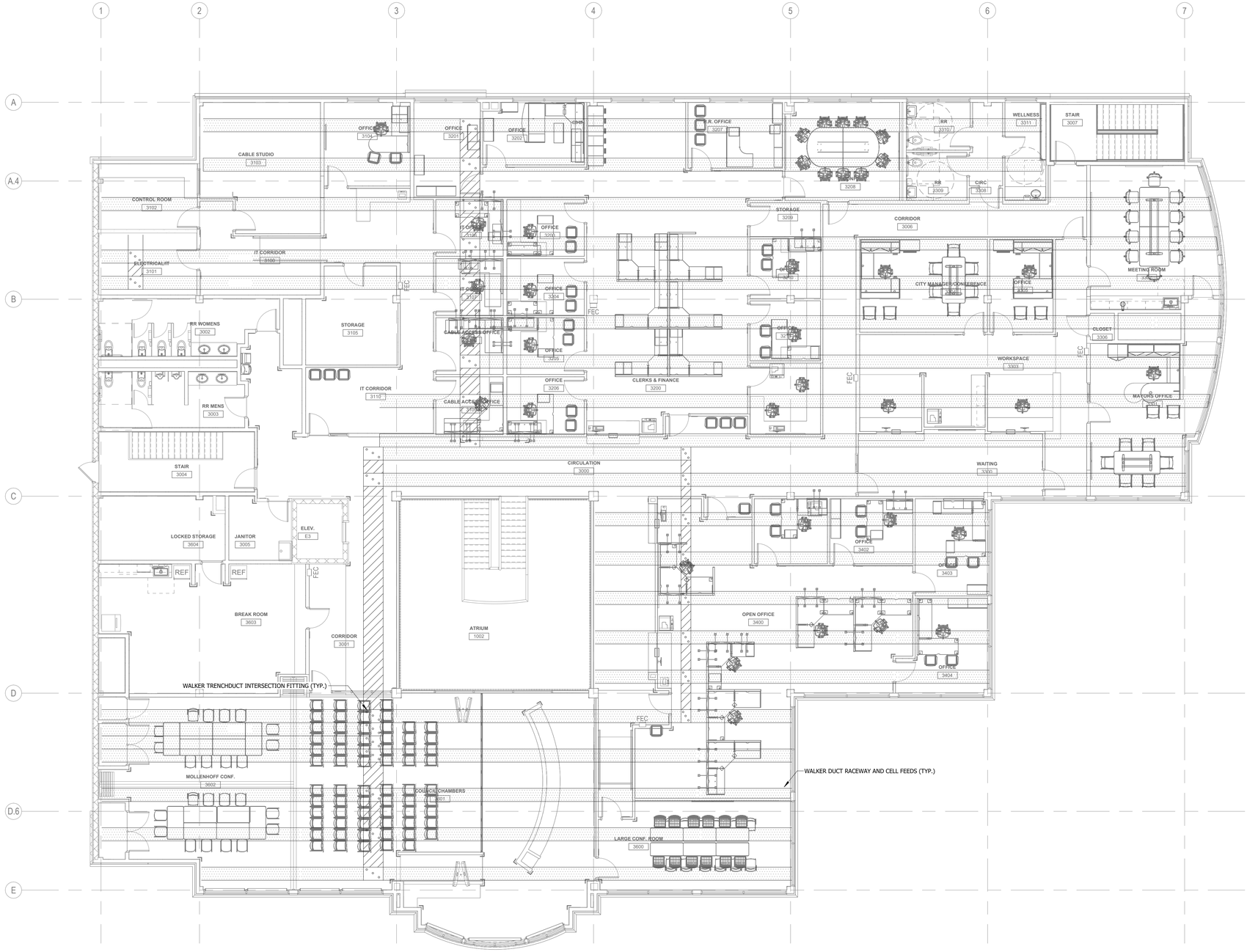

1 THIRD FLOOR POWER PLAN - WALKER DUCT
1/8" = 1'-0"

GENERAL NOTES:

A. ALL EXISTING WIRING LOCATED IN WALKER DUCT SYSTEM SHALL BE REMOVED COMPLETELY. EXISTING ACTIVATION LOCATIONS SHALL BE REMOVED. CUT AND PATCH TO MATCH EXISTING. FIELD VERIFY EXISTING LAYOUT.

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SHEET NAME:
THIRD FLOOR ELECTRICAL PLAN - WALKER DUCT

SHEET:
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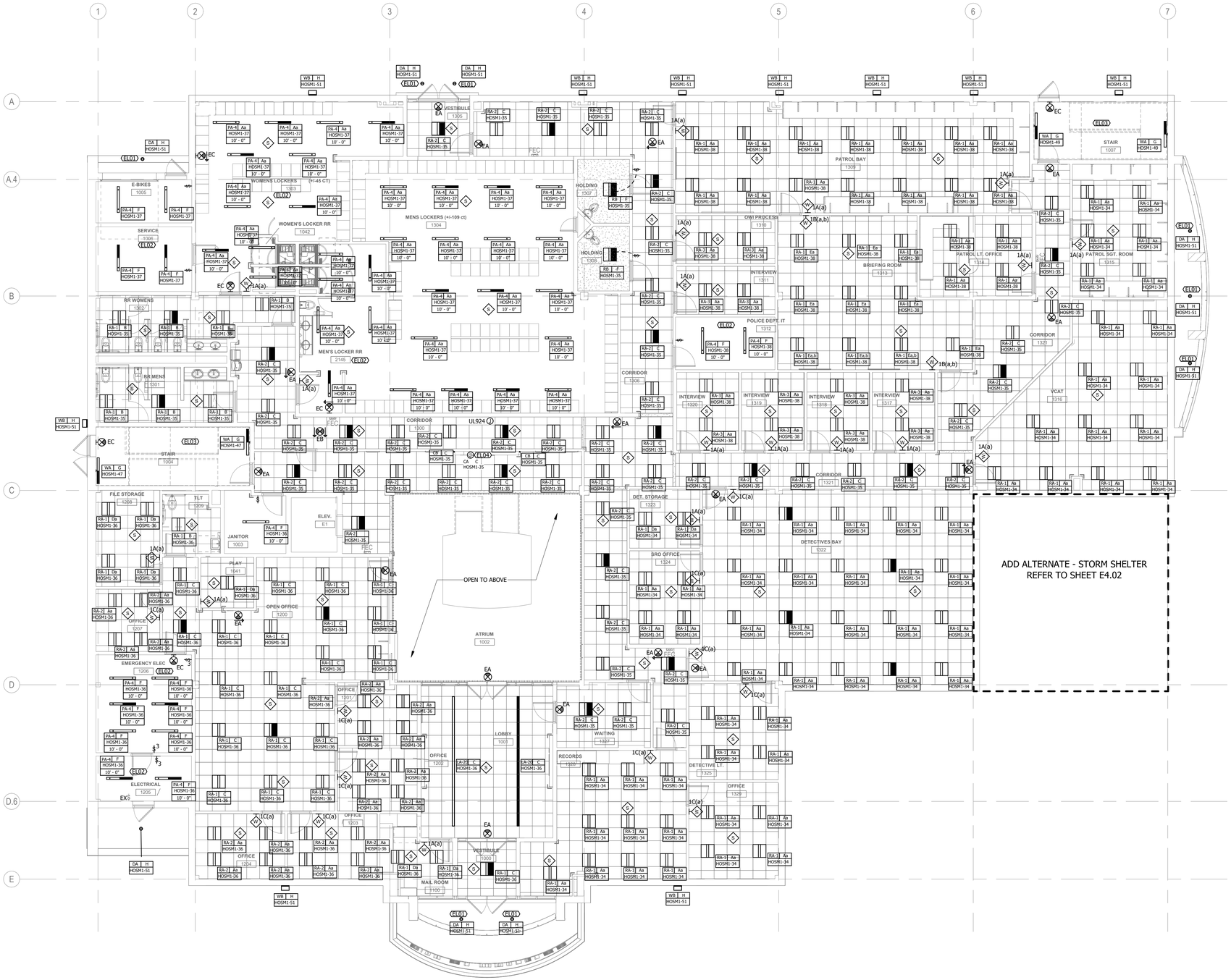


1 FIRST FLOOR LIGHTING PLAN
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

B. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

C. COORDINATE ALL DEVICES WITH ARCHITECTURAL PLANS AND CASEWORK SUBMITTALS.

D. OCCUPANCY AND DAYLIGHT SENSORS SHALL BE LOCATED PER MANUFACTURER'S RECOMMENDATIONS. IN EVENT OF CONFLICT OF DESIGNED DRAWINGS AND MANUFACTURER RECOMMENDATIONS, ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

E. REFER TO SPECIFICATION SECTION 26 0943 FOR ADDITIONAL DETAILS ASSOCIATED WITH THE LIGHTING CONTROLS. EACH AREA OF CONTROL SHALL HAVE A DEDICATED POWER PACK WITH ALL DEVICES SHOWN ON PLANS OPERATING TOGETHER.

F. ALL LIGHTING FIXTURES SHALL BE INSTALLED IN SUCH WAY THAT DRIVERS ARE ACCESSIBLE WITHOUT CUTTING OF CEILING. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF AREAS WHERE THIS IS NOT POSSIBLE.

G. ALL WALL-MOUNTED FIXTURES SHALL HAVE EXACT ROUGH-IN LOCATION DETERMINED BY DESIGN TEAM PRIOR TO ROUGH-IN.

H. THE ELECTRICAL CONTRACTOR SHALL EXTEND AN "UNSWITCHED" HOT CONDUCTOR FROM THE NEAREST NORMAL LIGHTING CIRCUIT TO EVERY UL924 LISTED EMERGENCY POWER PACK/TRANSFER DEVICE AND EXIT SIGNS REQUIRED FOR EMERGENCY EGRESS OPERATION. THE "UNSWITCHED" HOT CONDUCTOR SHALL BE USED FOR SENSING PURPOSES ONLY.

I. CONTRACTOR SHALL PROVIDE A UL924 RATED TRANSFER DEVICE IN ALL AREAS WHERE EMERGENCY EGRESS LIGHTING IS REQUIRED PER NFPA 101. LIGHTING CONTROLS MANUFACTURER SHALL DETERMINE EXACT QUANTITIES WITH LIGHTING CONTROL ZONES AND LAYOUTS.

J. UNLESS NOTED OTHERWISE BY DESIGNATED "LIGHTING CONTROL ZONES", SWITCHES SHOWN WILL CONTROL ALL FIXTURES IN THE ROOM SHOWN.

K. PROGRAMMABLE DEVICES SHALL BE CONFIGURED WITH THE CONTROL ZONES SHOWN ON THE PLANS AND SCENES PER CLIENT DIRECTION DURING COMMISSIONING.

L. ALL LIGHTING CONTROL SHALL OPERATE "MANUAL ON/AUTO OFF" PER CODE (IECC OR ASHRAE 90.1) UNLESS OTHERWISE NOTED IN THE SEQUENCE OF OPERATIONS OR THESE REFERENCE NOTES.

M. REFER TO ARCHITECTURAL ELEVATIONS AND REFLECTED CEILING PLANS FOR SPECIFIC DEVICE ROUGH-IN AND PLACEMENT. ANY DEVIATIONS FROM THE ARCHITECTURAL ELEVATIONS AND RCP'S SHALL BE REVIEWED AND APPROVED BY THE DESIGN TEAM PRIOR TO ROUGH-IN. IF A DEVICE IS REQUIRED PER SPECIFICATION, REQUIRED FOR OPERATION, OR IS DIFFERENT IN CONFIGURATION THAN SHOWN ON ELEVATIONS AND RCP'S, CLARIFICATION AND DIRECTION MUST BE GIVEN BY THE DESIGN TEAM BEFORE ROUGH-IN. DEVIATIONS OR ADDITIONAL DEVICES NOT APPROVED PRIOR TO INSTALLATION SHALL BE CORRECTED AT CONTRACTORS EXPENSE. THIS INCLUDES BUT IS NOT LIMITED TO THERMOSTATS, CONTROL SYSTEM SENSORS, ELECTRICAL DEVICES, SWITCHES, DIMMERS, TECHNOLOGY DEVICES, A/V DEVICES, SPEAKERS, FIRE ALARM DEVICES, ETC.

N. CEILING CONTRACTOR SHALL PROVIDE AND INSTALL CEILING ACCESS PANELS FOR ACCESSIBILITY TO ELECTRICAL JUNCTION BOXES, PLUMBING VALVES, BALANCING DAMPERS, CIRCUIT SETTERS, ETC. WHERE ABSOLUTELY NECESSARY. LOCATIONS WILL NEED TO BE APPROVED AND COORDINATED WITH THE DESIGN TEAM PRIOR TO INSTALLATION.

O. **PROVIDE TRANSFER DEVICES AND RELAYS REQUIRED TO ILLUMINATE EGRESS LIGHTING UPON ACTIVATION OF THE BUILDING FIRE ALARM SYSTEM PER NFPA 101 LIFE SAFETY CODE.**

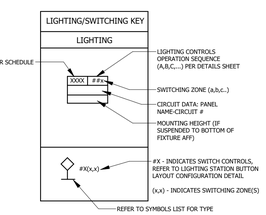
REFERENCED NOTES

EL01 ELECTRICAL CONTRACTOR SHALL CUT AND PATCH EXISTING CEILING OPENING TO MATCH EXISTING AS REQUIRED TO FIT NEW RETROFITTED DOWNLIGHT. PROVIDE GOOF RING AS REQUIRED.

EL02 COORDINATE LIGHTING MOUNTED IN THIS AREA WITH ALL TRADES. LIGHTING SHALL BE MOUNTED BELOW EQUIPMENT AT ALL TIMES. OFFSET AS REQUIRED.

EL03 MOUNTING HEIGHT OF STAIR WELL LIGHT FIXTURES SHALL BE 8 FEET ABOVE EACH STAIR WELL LANDING. COORDINATE MOUNTING LOCATION WITH DESIGN TEAM PRIOR TO INSTALLATION.

EL04 REFER TO ARCHITECTURAL DRAWINGS FOR LIGHT FIXTURE LOCATION AND ADDITIONAL INFORMATION. ELECTRICAL CONTRACTOR SHALL LOCATE DRIVERS IN A CONCEALED YET ACCESSIBLE LOCATION. COORDINATE WITH DESIGN TEAM AS REQUIRED.



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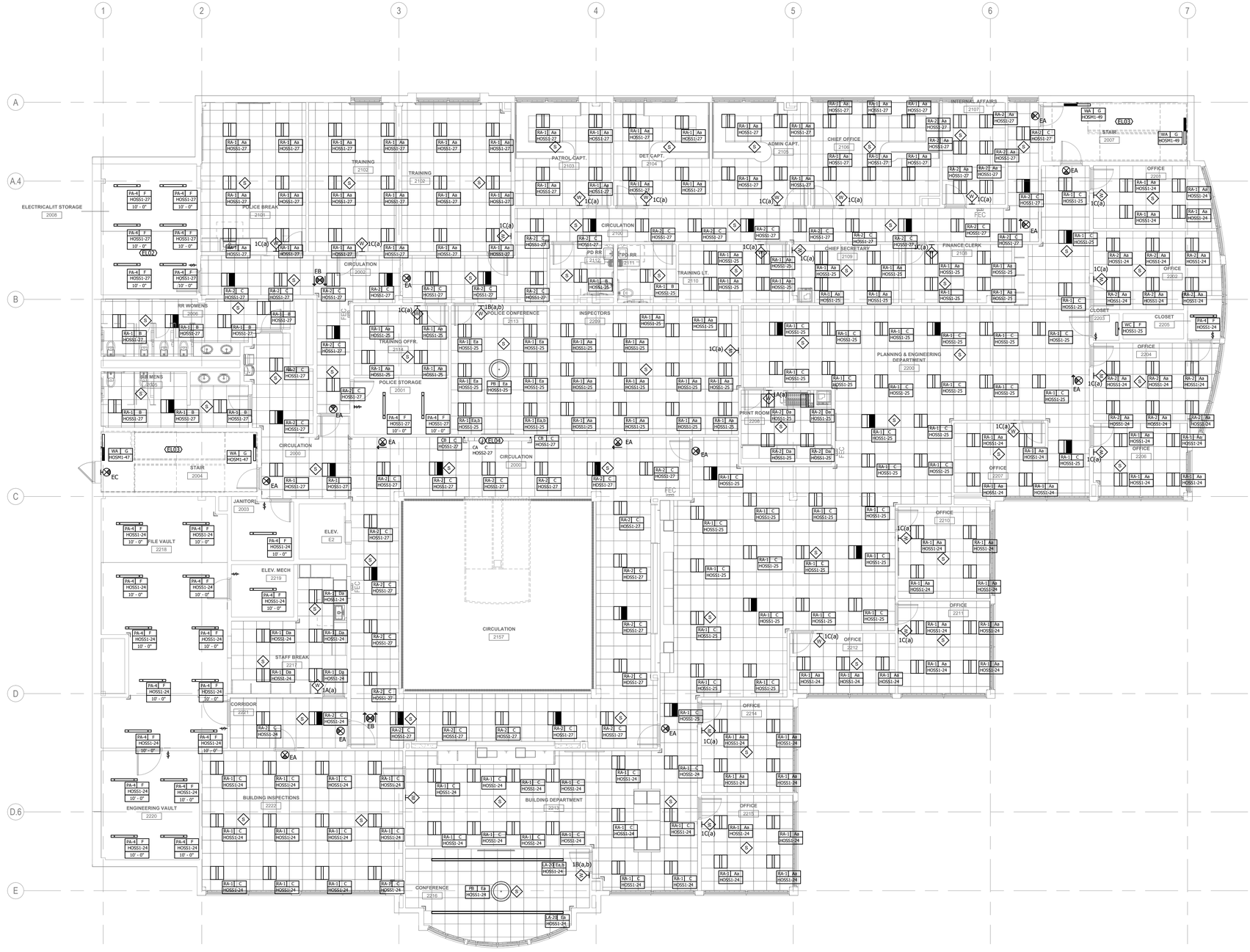

1 SECOND FLOOR LIGHTING PLAN
1/8" = 1'-0"

N

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I. CONTRACTOR SHALL PROVIDE A UL924 RATED TRANSFER DEVICE IN ALL AREAS WHERE EMERGENCY EGRESS LIGHTING IS REQUIRED PER NFPA 101. LIGHTING CONTROLS MANUFACTURER SHALL DETERMINE EXACT QUANTITIES WITH LIGHTING CONTROL ZONES AND LAYOUTS.

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REFERENCED NOTES

EL02 COORDINATE LIGHTING MOUNTED IN THIS AREA WITH ALL TRADES. LIGHTING SHALL BE MOUNTED BELOW EQUIPMENT AT ALL TIMES. OFFSET AS REQUIRED.

EL03 MOUNTING HEIGHT OF STAIR WELL LIGHT FIXTURES SHALL BE 8 FEET ABOVE EACH STAIR WELL LANDING. COORDINATE MOUNTING LOCATION WITH DESIGN TEAM PRIOR TO INSTALLATION.

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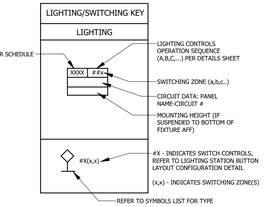

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SHEET NAME:
SECOND FLOOR LIGHTING PLAN

SHEET:
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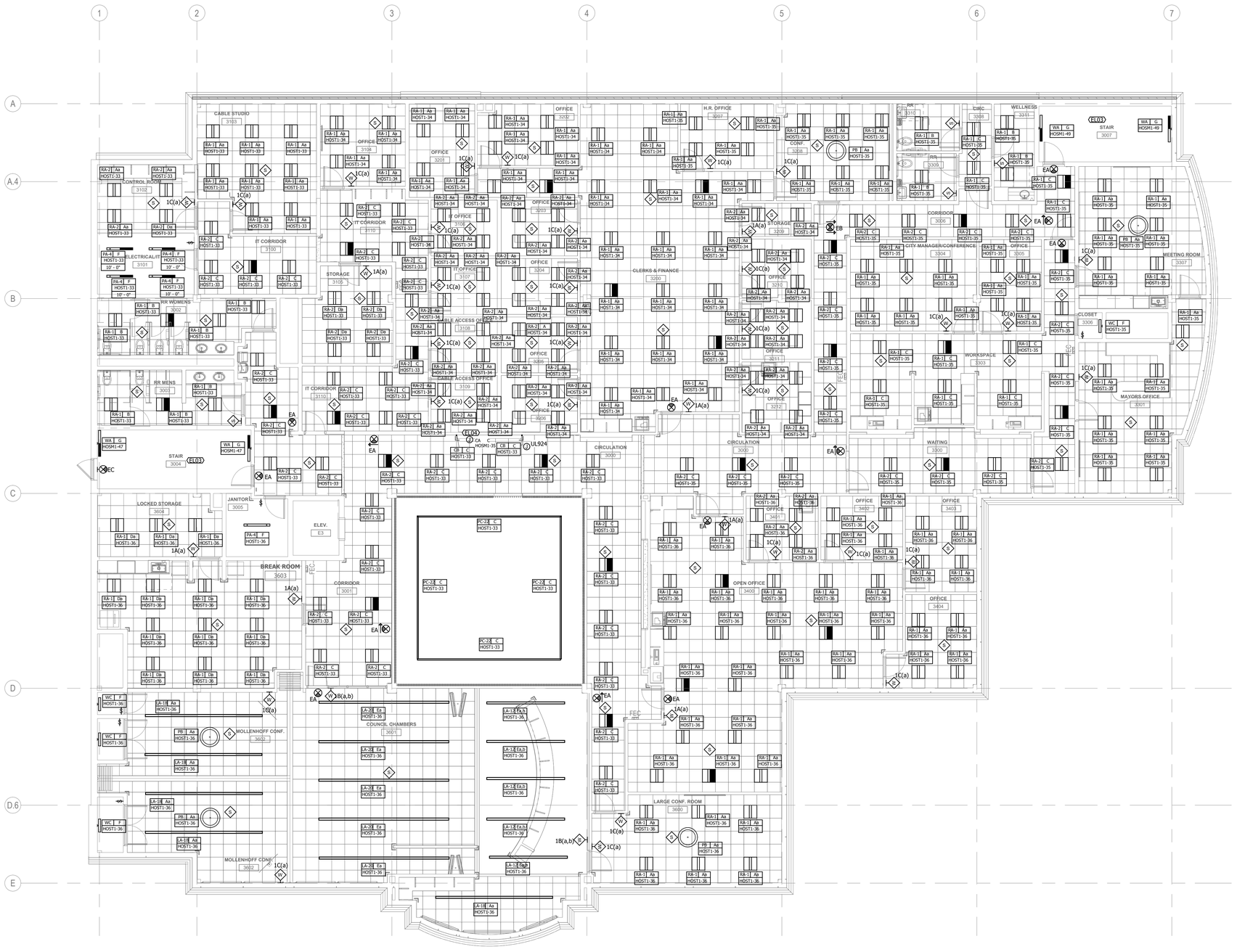

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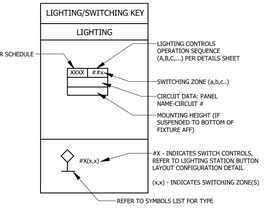

1 THIRD FLOOR LIGHTING PLAN
1/8" = 1'-0"

NOTE:
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THIRD FLOOR LIGHTING PLAN

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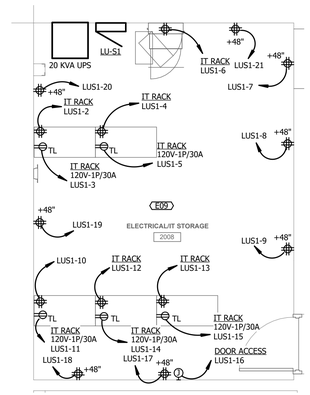
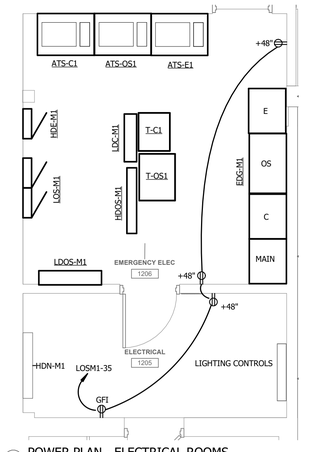
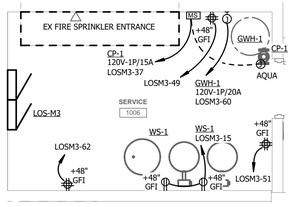


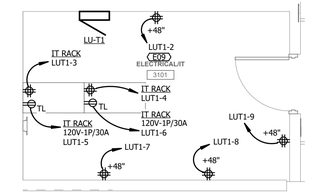
1 POWER PLAN - ELECTRICAL/IT STORAGE 2008
1/4" = 1'-0"



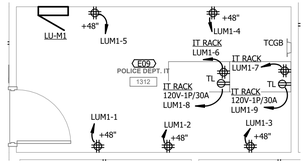
2 POWER PLAN - ELECTRICAL ROOMS
1/4" = 1'-0"



4 POWER PLAN - SERVICE 1006
1/4" = 1'-0"



5 POWER PLAN - ELECTRICAL 3101
1/4" = 1'-0"



3 POWER PLAN - POLICE DEPT. IT 1312
1/4" = 1'-0"

REFERENCED NOTES

E09 COORDINATE EXACT ELECTRICAL REQUIREMENTS OF ALL LOW VOLTAGE EQUIPMENT PRIOR TO INSTALLATION. COORDINATE MOUNTING HEIGHT, LOCATIONS, AND CONDUIT ROUTING WITH LOW VOLTAGE CONTRACTOR DURING CONSTRUCTION.

NOTE:
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E4.01

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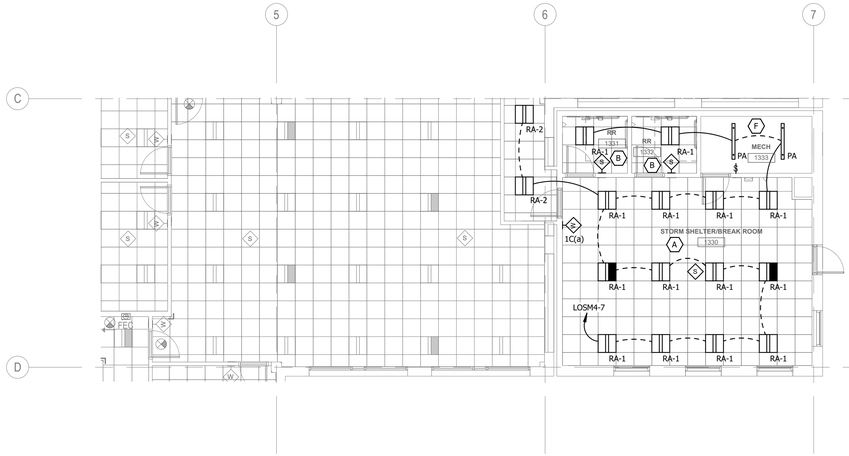
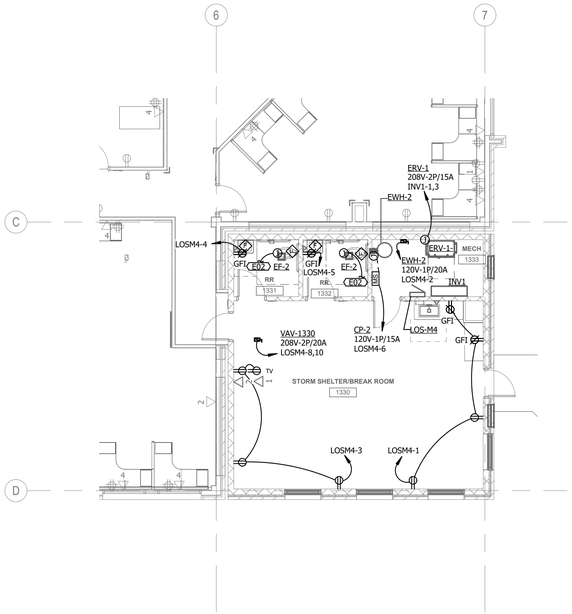


1 FIRST FLOOR LIGHTING PLAN - ALTERNATE 1
1/8" = 1'-0"



2 FIRST FLOOR POWER PLAN - ADD ALTERNATE
1/8" = 1'-0"

GENERAL NOTES:

A. ALL DISCONNECTS ON MECHANICAL EQUIPMENT SHALL BE MOUNTED ON STRUCTURE TO ALLOW REMOVAL OF THE EQUIPMENT FOR MAINTENANCE WITH A MINIMUM OF WIRING WORK. VERIFY NEC CLEARANCE REQUIREMENTS ARE MET PRIOR TO ROUGH-IN.

B. MAINTAIN SERVICE CLEARANCE AROUND ALL MECHANICAL & ELECTRICAL EQUIPMENT. DO NOT ROUTE PIPING OR CONDUIT IN CLEARANCE SPACE.

C. SURFACE RACEWAY SHALL NOT BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

D. ALL RECEPTACLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.

E. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

F. PROVIDE CONDUIT SLEEVES WITH INSULATED BUSHINGS SERVING ALL LOW VOLTAGE CABLING. DO NOT EXCEED 40% FILL.

G. PRIOR TO ROUGH-IN, COORDINATE ALL WALL DEVICES WITH FINAL CASEWORK ELEVATIONS AND OTHER TRADES. CONFLICTS SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

H. ALL FLOOR BOXES SHALL HAVE THEIR EXACT ROUGH-IN LOCATION DETERMINED BY DESIGN TEAM THROUGH DIMENSIONED DRAWINGS SIGNED BY OWNER PRIOR TO ROUGH-IN. LOCATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY.

I. PROVIDE AN ADDITIONAL 20A-1P BREAKER IN LOCAL PANEL FOR CONNECTION TO FIRE SMOKE DAMPERS (FSD). SEE HVAC PLANS FOR EXACT LOCATIONS. CLEARLY INDICATE ON AS-BUILT DRAWINGS.

J. IN ROOMS WHERE MULTIPLE COUNTER HEIGHTS EXIST, ALL ABOVE-COUNTER RECEPTACLE SHALL BE INSTALLED AT THE SAME HEIGHT ABOVE FLOOR. COORDINATE WITH DESIGN TEAM DURING CONSTRUCTION.

K. REFER TO T-SHEETS FOR ADDITIONAL ROUGH-IN INFORMATION. ALL AUDIO INPUTS SHALL BE ROUGHED IN ADJACENT TO RECEPTACLES SHOWN ON THIS PLAN UNLESS NOTED OTHERWISE.

L. DEVICES ON WALLS BELOW MODULAR FURNITURE SHALL BE MOUNTED CENTERED AT 10"A.F.F. VERIFY EXACT LOCATIONS WITH MODULAR FURNITURE SUPPLIER PRIOR TO ROUGH-IN.

M. ELECTRICAL CONTRACTOR SHALL PROVIDE TAMPER RESISTANT RECEPTACLES PER NEC 406.12.

N. REFER TO ARCHITECTURAL ELEVATIONS AND REFLECTED CEILING PLANS FOR SPECIFIC DEVICE ROUGH-IN AND PLACEMENT. ANY DEVIATIONS FROM THE ARCHITECTURAL ELEVATIONS AND RCP'S SHALL BE REVIEWED AND APPROVED BY THE DESIGN TEAM PRIOR TO ROUGH-IN. IF A DEVICE IS REQUIRED PER SPECIFICATION, REQUIRED FOR OPERATION, OR IS DIFFERENT IN CONFIGURATION THAN SHOWN ON ELEVATIONS AND RCP'S, CLARIFICATION AND DIRECTION MUST BE GIVEN BY THE DESIGN TEAM BEFORE ROUGH-IN. DEVIATIONS OR ADDITIONAL DEVICES NOT APPROVED PRIOR TO INSTALLATION SHALL BE CORRECTED AT CONTRACTORS EXPENSE. THIS INCLUDES BUT IS NOT LIMITED TO THERMOSTATS, CONTROL SYSTEM SENSORS, ELECTRICAL DEVICES, SWITCHES, DIMMERS, TECHNOLOGY DEVICES, A/V DEVICES, SPEAKERS, FIRE ALARM DEVICES, ETC.

O. CEILING CONTRACTOR SHALL PROVIDE AND INSTALL CEILING ACCESS PANELS FOR ACCESSIBILITY TO ELECTRICAL JUNCTION BOXES, PLUMBING VALVES, BALANCING DAMPERS, CIRCUIT SETTERS, ETC. WHERE ABSOLUTELY NECESSARY. LOCATIONS WILL NEED TO BE APPROVED AND COORDINATED WITH THE DESIGN TEAM PRIOR TO INSTALLATION.

P. **COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR DEVICES LABELED WITH "TV" WITH ARCHITECTURAL ELEVATIONS. LOCATE BEHIND TV/MONITOR TO COORDINATE WITH THE MOUNTING BRACKETS AND CONCEAL CONNECTIONS. COORDINATE WITH INSTALLER PRIOR TO ELECTRICAL ROUGH-IN.**

Q. **REFER TO SHEET E1.04 THROUGH SHEET E1.07 FOR MECHANICAL EQUIPMENT POWER AND ADDITIONAL INFORMATION.**

REFERENCED NOTES

E02 EXHAUST FAN SHALL BE POWERED FROM LIGHTING CIRCUIT AND CONTROLLED BY LIGHTING CONTROLS. IF THERE ARE TWO LIGHT SWITCHES, ELECTRICAL CONTRACTOR SHALL PROVIDE RELAYS, EACH PILOTED BY ONE OF THE SWITCHES AND WIRE THE TWO RELAY CONTACTS IN PARALLEL TO CONTROL THE FAN. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CONSULTANT:
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IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL ALTERNATE 1 PLANS

SHEET:
E4.02

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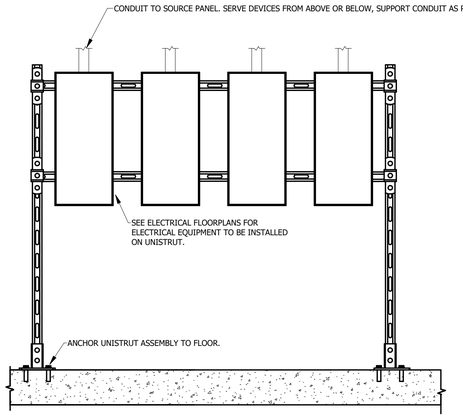
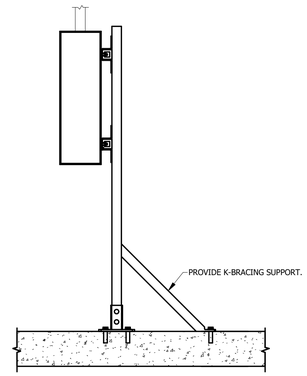


FRONT ELEVATION



SIDE ELEVATION

GENERAL NOTES:

A. ALL HARDWARE SHALL BE STAINLESS STEEL.

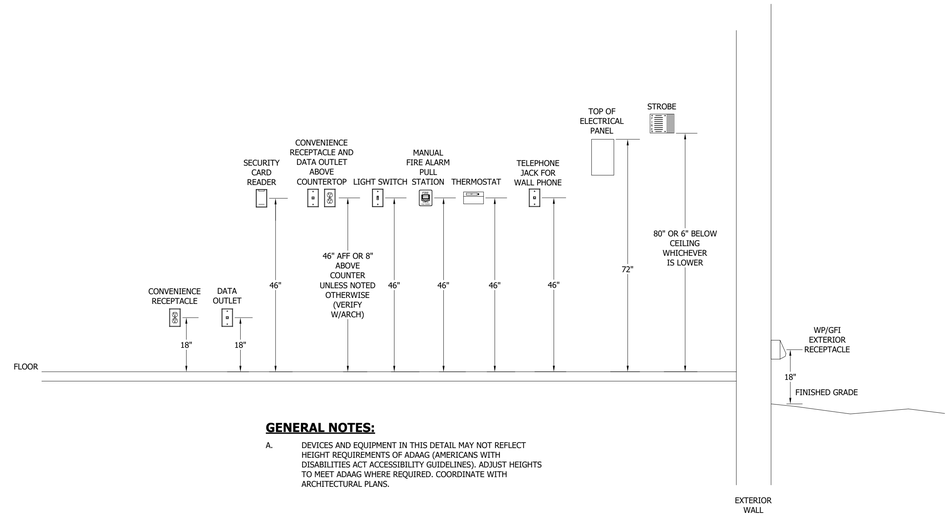
B. PROVIDE ALL NECESSARY COMPONENTS FOR A COMPLETE AND WORKING UNISTRUT SYSTEM.

C. COORDINATE EXACT ELECTRICAL REQUIREMENTS FOR EQUIPMENT PRIOR TO ROUGH-IN.

D. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. ELECTRICAL CONTRACTOR TO DETERMINE CONDUIT ROUTING.

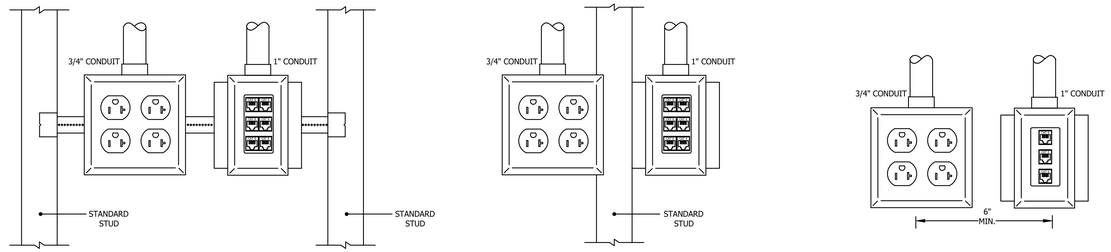
1 TYPICAL UNISTRUT MOUNTING DETAIL
No Scale



GENERAL NOTES:

A. DEVICES AND EQUIPMENT IN THIS DETAIL MAY NOT REFLECT HEIGHT REQUIREMENTS OF ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES). ADJUST HEIGHTS TO MEET ADAAG WHERE REQUIRED. COORDINATE WITH ARCHITECTURAL PLANS.

2 TYPICAL DEVICE ELEVATION DETAIL
No Scale



NOTES:
1. MINIMUM CONDUIT SIZE FOR LOW VOLTAGE WIRING SHALL BE 1". REFER TO SPECIFICATIONS FOR DETAILS.
2. PROVIDE 4 11/16" BOX COMPLETE WITH SINGLE GANG OPENING FOR ALL LOW VOLTAGE OUTLETS.
3. ELECTRICAL CONTRACTOR TO PROVIDE DECORATOR STYLE FACEPLATE. INSERT COLOR SHALL MATCH ELECTRICAL DEVICES. REFER TO SPECIFICATION 27 1005.
4. PROVIDE BLANKS AS NECESSARY.

NOTES:
1. MINIMUM CONDUIT SIZE FOR LOW VOLTAGE WIRING SHALL BE 1". REFER TO SPECIFICATIONS FOR DETAILS.
2. PROVIDE 4 11/16" BOX COMPLETE WITH SINGLE GANG OPENING FOR ALL LOW VOLTAGE OUTLETS.
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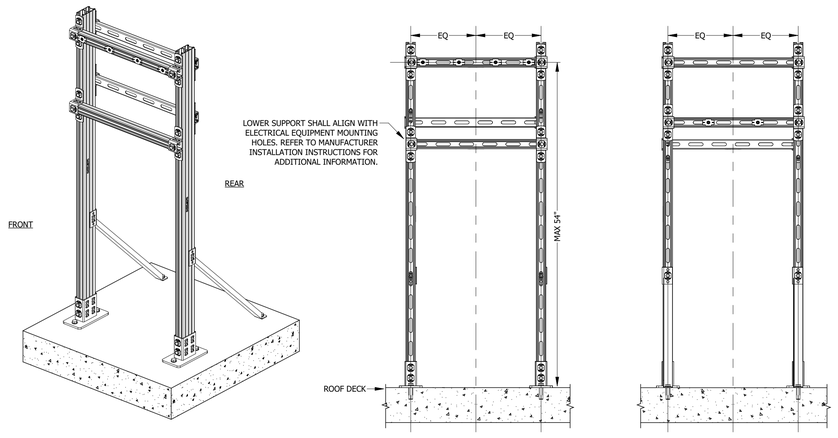
4. PROVIDE BLANKS AS NECESSARY.



ISOMETRIC | FRONT ELEVATION | REAR ELEVATION

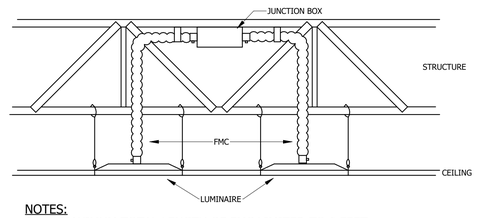
GENERAL NOTES:

A. PROVIDE ALL NECESSARY COMPONENTS FOR A COMPLETE AND WORKING UNISTRUT SYSTEM.

B. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

4 TYPICAL UNISTRUT ROOF MOUNTING DETAIL
No Scale

3 TYPICAL DUPLEX RECEPTACLE AND LV BOX MOUNTING DETAIL
No Scale



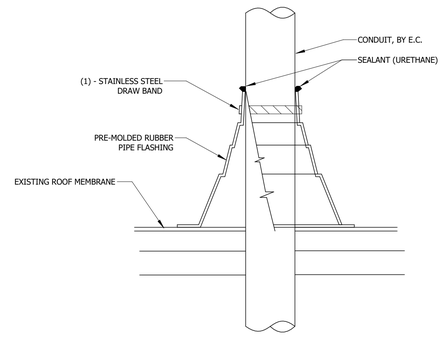
NOTES:

A. MAXIMUM TOTAL LENGTH OF FMC LIMITED TO 6 FEET WITHOUT SEPARATE EQUIPMENT GROUND CONDUCTOR.

B. LUMINAIRES SHALL NOT BE DAISY CHAINED TOGETHER WITH FMC.

C. REFER TO ARTICLE 250.118(5)D FOR ADDITIONAL DETAILS.

5 TYPICAL LIGHT FIXTURE WIRING DETAIL
No Scale



6 ELECTRICAL CONDUIT ROOF PENETRATION DETAIL
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL DETAILS

SHEET:
E5.01

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2 EXISTING ELECTRICAL ROOM
No Scale



1 EXISTING PANEL TP1, TP2
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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ELECTRICAL DETAILS

SHEET:
E5.02

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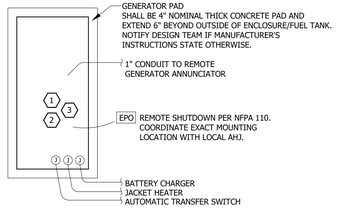
REFERENCED NOTES: (#)

1. PROVIDE CONDUCTORS TO AUTOMATIC TRANSFER SWITCH. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR CONDUIT AND WIRE SIZE INFORMATION.
2. GENERATOR-MOUNTED BREAKER(S).
3. EXTEND DIESEL FUEL VENTS TO ABOVE ROOF. PROVIDE WITH RAIN CAP.



1 GENERATOR ROUGH-IN DETAIL
No Scale

TRANSFORMER SCHEDULE

DEVICE TAG	T-C1	T-OS1
NEMA ENERGY RATING	TP-1	TP-1
ENCLOSURE RATING	NEMA 1	NEMA 1
CAPACITY	45	225
WINDING MATERIAL	ALUMINUM	ALUMINUM
MOUNTING	FLOOR	FLOOR
PRIMARY OCPD TYPE	BREAKER	BREAKER
PRIMARY OCPD SIZE (AMPS)	70	350
PRIMARY VOLTAGE	480Y/277	480Y/277
SECONDARY VOLTAGE	208/120	208/120

ACCESSORIES/ACRONYMS - ONE LINE DIAGRAM

- SPD — SURGE PROTECTION DEVICE
- DPM — DIGITAL POWER MONITOR
- LSI-X — LONG SHORT INSTANTANTEOUS, X INDICATES FEATURE
  - A - ALARM
  - G - GROUND FAULT INDICATOR
- ERMS — ENERGY REDUCING MAINTENANCE SWITCH
- VFD — VARIABLE FREQUENCY DRIVE
- X — DISCONNECT, X INDICATES TYPE
  - F, NF - FUSED, NON FUSED
  - HOA - HAND/OFF/AUTO
  - MS - MOTOR STARTER
  - C - COMBINATION STARTER

LINE LEGEND - ONE LINE DIAGRAM

- EXISTING EQUIPMENT
- DEMOLISHED EQUIPMENT
- NEW EQUIPMENT

NEW ELECTRICAL EQUIPMENT IDENTIFICATION LEGEND

PANELBOARDS:
L D XX - M1
- IDENTIFICATION #: SEQUENTIAL NUMBERING
- IDENTIFICATION #: MAIN FLOOR (M), SECOND FLOOR (S), THIRD FLOOR (T)
- BRANCH: CRITICAL OPERATIONS POWER SYSTEMS (C), EMERGENCY (E), OPTIONAL STANDBY (OS), UPS (U)
- DISTRIBUTION PANEL: (D) IF APPLICABLE OR BLANK
- VOLTAGE: 120/208 (L) OR 277/480 (H)

TRANSFORMERS:
T - N 1
- IDENTIFICATION #: SEQUENTIAL NUMBERING
- BRANCH: CRITICAL OPERATIONS POWER SYSTEMS (C), EMERGENCY (E), OPTIONAL STANDBY (OS), UPS (U)
- TRANSFORMER

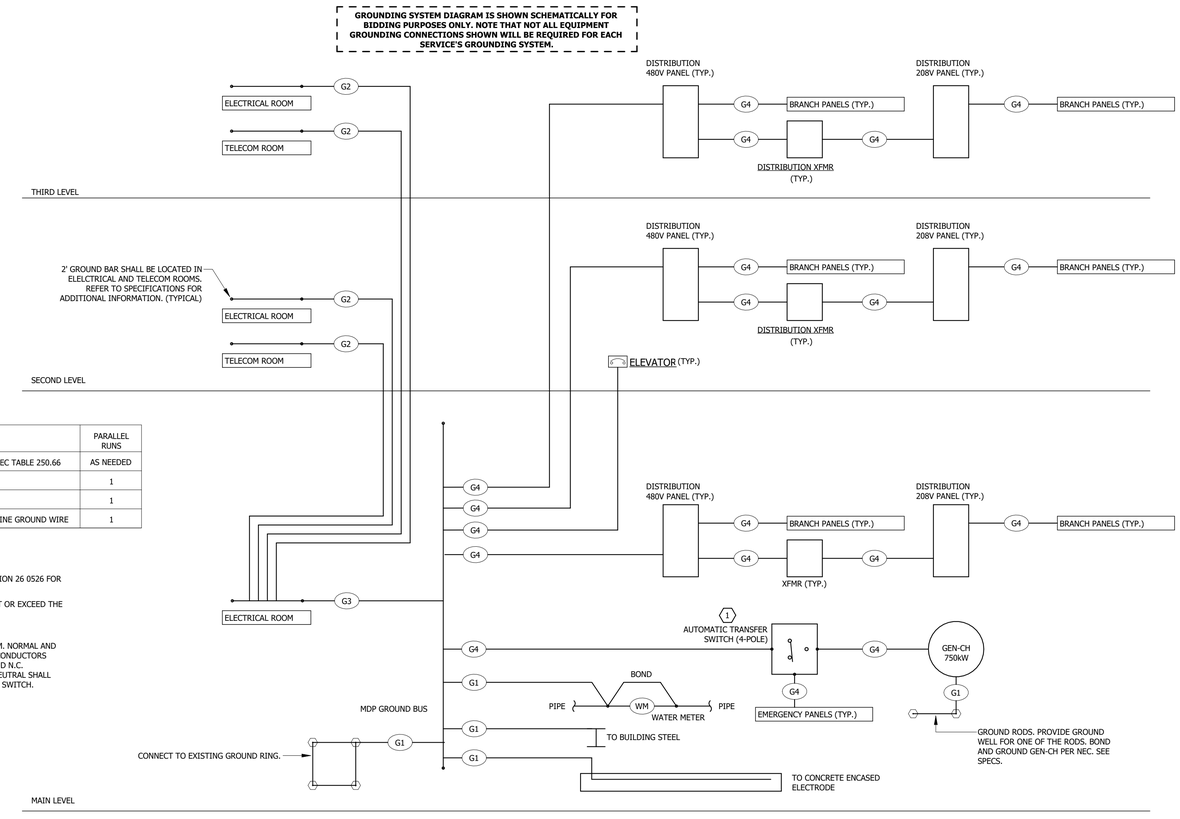
TRANSFER SWITCHES/GENERATOR DOCKING STATION:
ATS - N 1
- IDENTIFICATION #: SEQUENTIAL NUMBERING
- BRANCH: CRITICAL OPERATIONS POWER SYSTEMS (C), EMERGENCY (E), OPTIONAL STANDBY (OS)
- EQUIPMENT: AUTOMATIC TRANSFER SWITCH (ATS), GENERATOR DOCKING STATION (GDS)

SWITCHBOARDS:
HDN-M1
- LOCATION: MAIN FLOOR (M)
- EQUIPMENT:

HDN - FED FROM UTILITY

HDG - FED FROM GENERATOR

GROUNDING SYSTEM DIAGRAM IS SHOWN SCHEMATICALLY FOR BIDDING PURPOSES ONLY. NOTE THAT NOT ALL EQUIPMENT GROUNDING CONNECTIONS SHOWN WILL BE REQUIRED FOR EACH SERVICE'S GROUNDING SYSTEM.



GROUNDING CONDUCTOR CHART

	PHASE CONDUCTORS QUANTITY AND SIZE	PARALLEL RUNS
G1	SIZE AND QUANTITY PER NEC TABLE 250.66	AS NEEDED
G2	#2/0	1
G3	#3/0	1
G4	REFER TO ELECTRICAL ONE-LINE GROUND WIRE	1

GENERAL NOTES:
A. REFER TO SPECIFICATION SECTION 26 0526 FOR ADDITIONAL INFORMATION.
B. COMPLETE INSTALL SHALL MEET OR EXCEED THE REQUIREMENTS OF NEC 250.

REFERENCE NOTES:
1. A SEPARATELY DERIVED SYSTEM. NORMAL AND GENERATOR POWER NEUTRAL CONDUCTORS CONNECT DIRECTLY TO N.O. AND N.C. CONTACTS IN SWITCH. LOAD NEUTRAL SHALL CONNECT TO COMMON SIDE OF SWITCH.

2 TYPICAL GROUNDING SYSTEM RISER DIAGRAM
No Scale

COPPER CONDUCTOR AND SIZING CHART

	CONDUCTORS (THWN-2)			CONDUIT		PARALLEL RUNS
	PHASE	NEUTRAL	GROUND	EMT	SCH 40	
15/2	(2) #12 AWG	#12 AWG	#12 AWG	3/4"	3/4"	1
20/2	(2) #12 AWG	#12 AWG	#12 AWG	3/4"	3/4"	1
25/2	(2) #10 AWG	#10 AWG	#10 AWG	3/4"	3/4"	1
30/2	(2) #10 AWG	#10 AWG	#10 AWG	3/4"	3/4"	1
35/2	(2) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
40/2	(2) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
45/2	(2) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
50/2	(2) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
60/2	(2) #6 AWG	#6 AWG	#10 AWG	3/4"	3/4"	1
70/2	(2) #4 AWG	#4 AWG	#8 AWG	1"	1"	1
80/2	(2) #4 AWG	#4 AWG	#8 AWG	1"	1"	1
90/2	(2) #3 AWG	#3 AWG	#8 AWG	1-1/4"	1-1/4"	1
100/2	(2) #3 AWG	#3 AWG	#8 AWG	1-1/4"	1-1/4"	1

COPPER CONDUCTOR AND SIZING CHART

	CONDUCTORS (THWN-2)			CONDUIT		PARALLEL RUNS
	PHASE	NEUTRAL	GROUND	EMT	SCH 40	
15/3	(3) #12 AWG	-	#12 AWG	3/4"	3/4"	1
20/3	(3) #12 AWG	-	#12 AWG	3/4"	3/4"	1
25/3	(3) #10 AWG	-	#10 AWG	3/4"	3/4"	1
30/3	(3) #10 AWG	-	#10 AWG	3/4"	3/4"	1
35/3	(3) #8 AWG	-	#10 AWG	3/4"	3/4"	1
40/3	(3) #8 AWG	-	#10 AWG	3/4"	3/4"	1
45/3	(3) #8 AWG	-	#10 AWG	3/4"	3/4"	1
50/3	(3) #8 AWG	-	#10 AWG	3/4"	3/4"	1
60/3	(3) #6 AWG	-	#10 AWG	3/4"	3/4"	1
70/3	(3) #4 AWG	-	#8 AWG	1"	1"	1
80/3	(3) #4 AWG	-	#8 AWG	1"	1"	1
90/3	(3) #3 AWG	-	#8 AWG	1-1/4"	1-1/4"	1
100/3	(3) #3 AWG	-	#8 AWG	1-1/4"	1-1/4"	1
110/3	(3) #2 AWG	-	#6 AWG	1-1/4"	1-1/4"	1
125/3	(3) #1 AWG	-	#6 AWG	1-1/4"	1-1/4"	1
150/3	(3) 1/0 AWG	-	#6 AWG	1-1/2"	1-1/2"	1
175/3	(3) 2/0 AWG	-	#6 AWG	2"	2"	1
200/3	(3) 3/0 AWG	-	#6 AWG	2"	2"	1
225/3	(3) 4/0 AWG	-	#4 AWG	2"	2"	1
250/3	(3) 250 MCM	-	#4 AWG	2-1/2"	2-1/2"	1
300/3	(3) 350 MCM	-	#4 AWG	2-1/2"	2-1/2"	1
350/3	(3) 500 MCM	-	#3 AWG	3"	3"	1
400/3	(3) 3/0 AWG	-	#3 AWG	2"	2"	2

COPPER CONDUCTOR AND SIZING CHART

	CONDUCTORS (THWN-2)			CONDUIT		PARALLEL RUNS
	PHASE	NEUTRAL	GROUND	EMT	SCH 40	
15/4	(3) #12 AWG	#12 AWG	#12 AWG	3/4"	3/4"	1
20/4	(3) #12 AWG	#12 AWG	#12 AWG	3/4"	3/4"	1
25/4	(3) #10 AWG	#10 AWG	#10 AWG	3/4"	3/4"	1
30/4	(3) #10 AWG	#10 AWG	#10 AWG	3/4"	3/4"	1
35/4	(3) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
40/4	(3) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
45/4	(3) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
50/4	(3) #8 AWG	#8 AWG	#10 AWG	3/4"	3/4"	1
60/4	(3) #6 AWG	#6 AWG	#10 AWG	1"	1"	1
70/4	(3) #4 AWG	#4 AWG	#8 AWG	1-1/4"	1-1/4"	1
80/4	(3) #4 AWG	#4 AWG	#8 AWG	1-1/4"	1-1/4"	1
90/4	(3) #3 AWG	#3 AWG	#8 AWG	1-1/4"	1-1/4"	1
100/4	(3) #3 AWG	#3 AWG	#8 AWG	1-1/4"	1-1/4"	1
110/4	(3) #2 AWG	#2 AWG	#6 AWG	1-1/4"	1-1/4"	1
125/4	(3) #1 AWG	#1 AWG	#6 AWG	1-1/2"	1-1/2"	1
150/4	(3) 1/0 AWG	1/0 AWG	#6 AWG	2"	2"	1
175/4	(3) 2/0 AWG	2/0 AWG	#6 AWG	2"	2"	1
200/4	(3) 3/0 AWG	3/0 AWG	#6 AWG	2"	2"	1
225/4	(3) 4/0 AWG	4/0 AWG	#4 AWG	2-1/2"	2-1/2"	1
250/4	(3) 250 MCM	250 MCM	#4 AWG	3"	3"	1
300/4	(3) 350 MCM	350 MCM	#4 AWG	3"	3"	1
350/4	(3) 500 MCM	500 MCM	#3 AWG	4"	4"	1
400/4	(3) 3/0 AWG	3/0 AWG	#3 AWG	2"	2"	2
450/4	(3) 4/0 AWG	4/0 AWG	#2 AWG	2-1/2"	2-1/2"	2
500/4	(3) 250 MCM	250 MCM	#2 AWG	3"	3"	2
600/4	(3) 350 MCM	350 MCM	#1 AWG	3"	3"	2
700/4	(3) 500 MCM	500 MCM	1/0 AWG	4"	4"	2
800/4	(3) 600 MCM	600 MCM	1/0 AWG	4"	4"	2
1000/4	(3) 400 MCM	400 MCM	2/0 AWG	3"	3"	3
1200/4	(3) 350 MCM	350 MCM	3/0 AWG	3"	3"	4

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ONE LINE DIAGRAM DETAILS

SHEET:
E5.04

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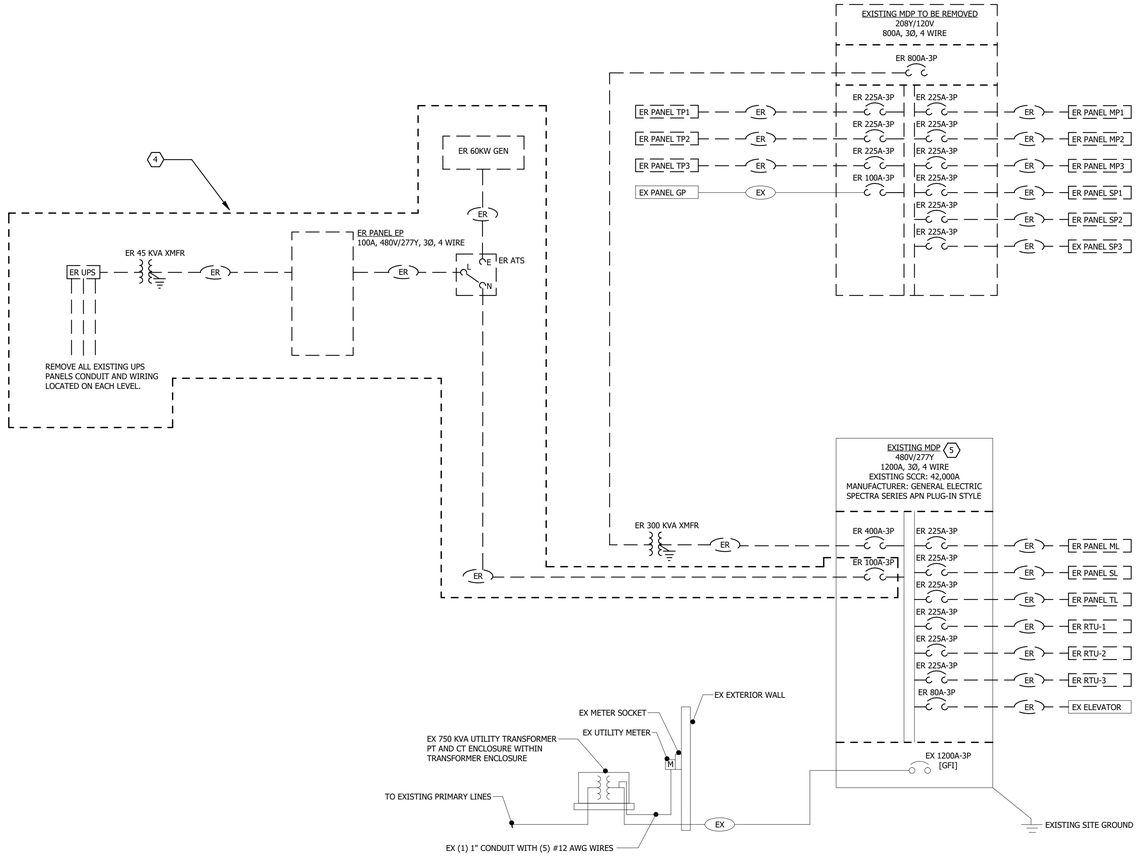

1 ONE LINE DIAGRAM - DEMOLITION
No Scale

GENERAL NOTES:

A. ELECTRICAL POWER OUTAGES, IF REQUIRED, SHOULD BE STRATEGICALLY MINIMIZED AND SCHEDULED CLOSELY WITH OWNER. CHANGEOVERS COULD BE REQUIRED TO OCCUR AT ANY HOUR.

B. MAINTAIN ALL SERVICE CLEARANCES REQUIRED BY THE UTILITY AND NEC. COORDINATE INSTALLATION WITH UTILITY REQUIREMENTS PRIOR TO ROUGH-IN.

C. UTILITY CONTACT: MIDAMERICAN ENERGY

D. REFER TO SITE PLAN ON SHEET ME0.01 FOR ADDITIONAL REQUIREMENTS AND RESPONSIBILITIES.

E. INSTALL ALL CONDUCTORS AS PER MANUFACTURER'S RECOMMENDATIONS.

F. COORDINATE WITH ENGINEER FOR SEQUENCE OF OPERATION RELATED TO AUTOMATIC TRANSFER SWITCH.

G. ELECTRICAL SERVICE ENTRANCE LAYOUT MAY VARY FROM WHAT IS SHOWN ON PLANS BASED ON MANUFACTURER PROVIDING THE SYSTEM. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR FITTING SYSTEM PROVIDED IN THE SPACE SHOWN ON PLANS.

H. EXTERNAL MOUNTED SURGE PROTECTION DEVICES SHALL BE INSTALLED PER MANUFACTURER'S GUIDELINES. MINIMIZE DISTANCE FROM EQUIPMENT.

I. **ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUCTOR LENGTHS AND BREAKERS MANUFACTURER INFORMATION TO THE DESIGN TEAM FOR SELECTIVE COORDINATION PER NEC 700.28. NECESSARY DEVICES SHALL HAVE THE ABILITY TO BE SELECTIVELY COORDINATED.**

J. **EXISTING ELECTRICAL EQUIPMENT MANUFACTURER: GENERAL ELECTRIC (NOW ABB). COORDINATE WITH ABB REPRESENTATIVE FOR RETROFIT BREAKERS TO BE PROVIDED IN EXISTING EQUIPMENT.**

CONTACT INFO:
EVAN SMITH (FIELD APPLICATION ENGINEER)

EMAIL: EVAN.SMITH1@US.ABB.COM
MOBILE: 1-319-371-9679
OFFICE: 1-319-750-6954

REFERENCED NOTES: (#)

1. CONNECT EACT ATS WITH DEDICATED CONTROL WIRE TO GENERATOR AND GENERATOR CONNECTION BOX. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURERS.
2. CONNECT GROUND FIELD WITH #3/0 GROUNDING ELECTRODE CONDUCTOR (NEC 250.66) USING EXOTHERMIC WELDS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. BASE BID: INV1 AND PANEL LBOS-M4 SHALL NOT BE INSTALLED.

   ALTERNATE #1: INSTALL ASSOCIATED EQUIPMENT AND WORK SHOWN.
4. EXISTING GENERATOR, GENERATOR PAD, CONDUIT, WIRING, AND ALL ASSOCIATED COMPONENTS SHALL BE REMOVED COMPLETELY. CUT AND PATCH TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR.
5. EXISTING 480V MDP TO BE RENAMED TO HDN-M1. PROVIDE NEW NEWPLATE PER SPECIFICATIONS.
6. DUAL PURPOSE GENERATOR CONNECTION BOX. QUICK CONNECTS FOR LOAD BANK AND TEMPORARY GENERATOR SHALL BE PROVIDED AT BOX. 1200A, 4-POLE WITH SWITCHED NEUTRAL, NEMA 3R. REFER TO 26 3213 FOR ADDITIONAL INFORMATION.
7. COORDINATE EXACT ELECTRICAL REQUIREMENTS OF OWNER PROVIDED UPS.
8. REFER TO TRANSFORMER SCHEDULE ON SHEET E5.04 FOR ADDITIONAL INFORMATION.

NOTE:
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24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ONE LINE DIAGRAM - DEMOLITION

SHEET:
E5.05

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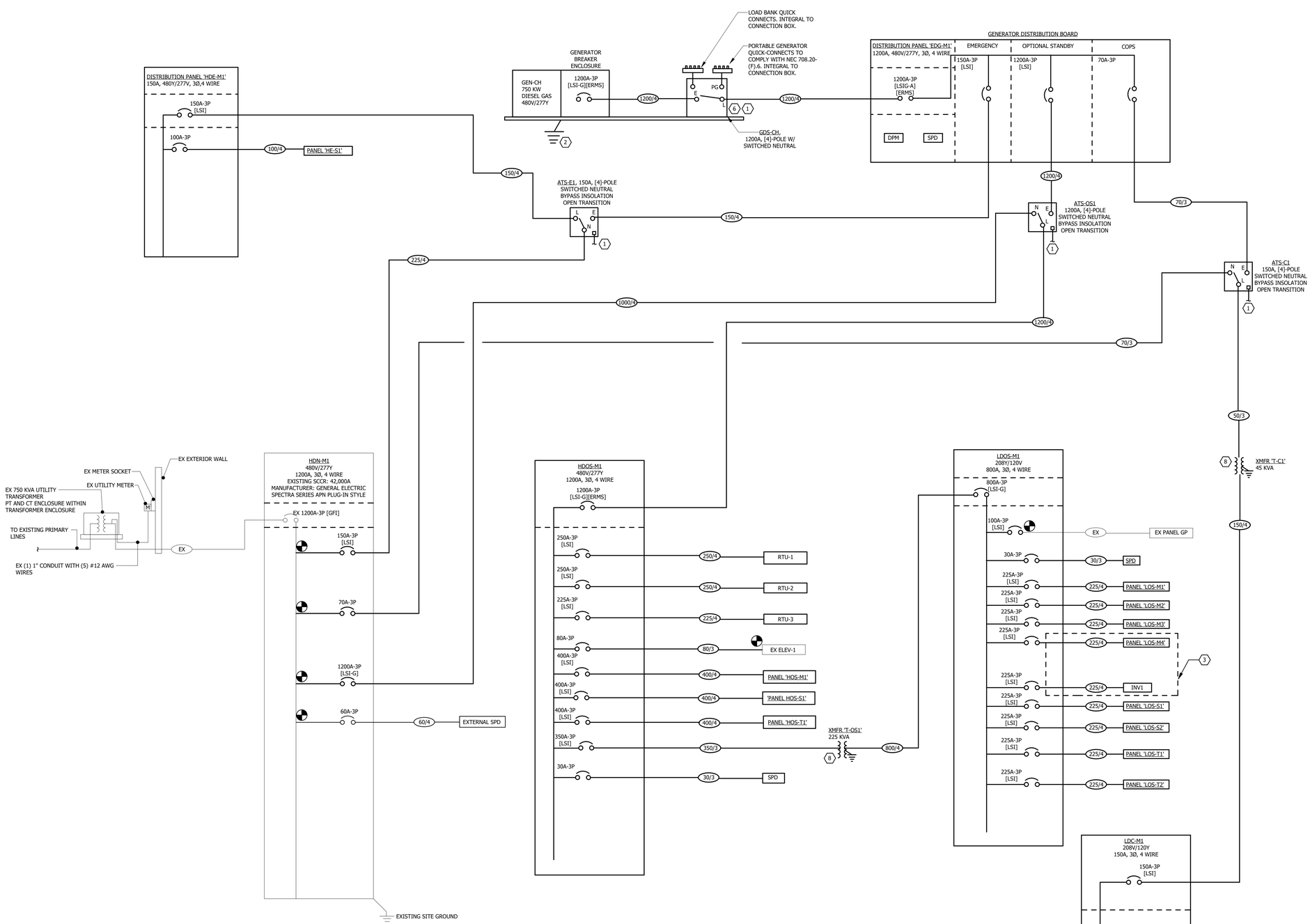

1 ONE LINE DIAGRAM
No Scale

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OWNER SIGN-OFF:

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: ONE LINE DIAGRAM - NEW

SHEET: E5.06

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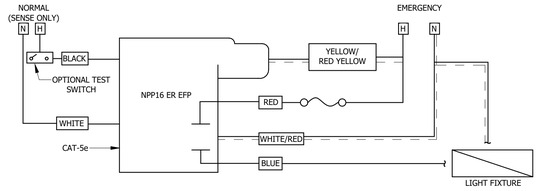
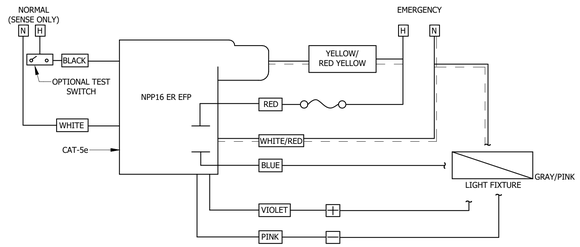
24-187 - CITY HALL RELOCATION

DIAGRAM FOR NON-DIMMING FIXTURES



LEGEND	BASE (120/277V)	230 (220/240VAC)	347 (120/347VAC)
WHITE/RED	EMER. NEUTRAL		
YELLOW	120VAC EMER. HOT	N/A	N/A
RED/YELLOW	277VAC EMER. HOT	220-240VAC EMER. HOT	347VAC EMER.HOT
RED	277VAC EMER. HOT	220-240VAC EMER. HOT	347VAC EMER.HOT
BLUE	EMER. LOAD (SWITCHED OUT)		
BLACK	120-277VAC NORM. HOT		120-347 NORM. HOT
WHITE	NORM. NEUTRAL		

DIAGRAM FOR DIMMING FIXTURES



LEGEND	BASE (120/277V)	230 (220/240VAC)	347 (120/347VAC)
WHITE/RED	EMER. NEUTRAL		
YELLOW	120VAC EMER. HOT	N/A	N/A
RED/YELLOW	277VAC EMER. HOT	220-240VAC EMER. HOT	347VAC EMER.HOT
RED	277VAC EMER. HOT	220-240VAC EMER. HOT	347VAC EMER.HOT
BLUE	EMER. LOAD (SWITCHED OUT)		
BLACK	120-277VAC NORM. HOT		120-347 NORM. HOT
WHITE	NORM. NEUTRAL		
VIOLET	0-10V DIMMING (+)		
PINK	0-10V COM(-)		

SEQUENCE OF OPERATIONS:

- DURING NORMAL POWER OPERATIONS, EMERGENCY FIXTURES SHALL BE CONTROLLED WITH THE NORMAL FIXTURES.
- UPON NORMAL POWER LOSS, EMERGENCY FIXTURES SHALL ILLUMINATE TO FULL BRIGHTNESS REGARDLESS OF LOAD CONTROLLER STATE.

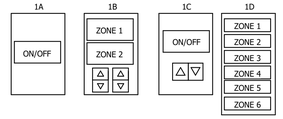
GENERAL NOTES:

1. REFERENCED MANUFACTURER: NLIGHT CONTROLS - ACUITY BRANDS
2. **THIS SCHEMATIC IS DIAGRAMMATIC IN NATURE AND SHOWS THE GENERAL INTENT OF THE INSTALLATION. COORDINATE WITH LIGHTING CONTROLS MANUFACTURER FOR THEIR RESPECTIVE INSTALLATION INSTRUCTIONS. PROVIDE TRANSFER DEVICES, AND RELAYS REQUIRED TO ILLUMINATE EGRESS LIGHTING UPON ACTIVATION OF THE BUILDING FIRE ALARM SYSTEM PER NFPA 101 LIFE SAFETY CODE.**
3.

2 EMERGENCY LIGHTING CONTROL RELAY SCHEMATIC
No Scale

INVERTER SCHEDULE	
INVERTER TAG	INV-1
INPUT VOLTAGE	208V
OUTPUT VOLTAGE	120V
MINIMUM CAPACITY	2000VA
OUTPUT BREAKER RATING	20A
OUTPUT CIRCUIT BREAKER QUANTITY	2

INVERTER SHALL POWER VENTILATION EQUIPMENT (ERV-1) AND EMERGENCY LIGHTING. UNIT SHALL HAVE SELF-TESTING CAPABILITIES.



NOTES:

1. SCHEMATIC SHOWS GENERAL INTENT OF LIGHTING CONTROLS. LIGHTING CONTROL MANUFACTURER SHALL DETERMINE EXACT BUTTON LAYOUT DURING SUBMITTALS.
2. COORDINATE ENGRAVING LABELS WITH OWNER DURING SUBMITTALS.

1 LIGHTING BUTTON STATION LAYOUT
No Scale

FLOOR BOX SCHEDULE					
TYPE	MANUFACTURER	PRODUCT	DEVICES	NOTES	APPROVED VENDORS
PT-1	LEGRAND	6AT EVOLUTION SERIES	4 GANG: (2) DUPLEX RECEPTACLES, (1) DATA, (1) BLANK	RECESSED FLOOR BOX SUITABLE FOR POKE THRU APPLICATION. PROVIDE METAL COVER AND TRIM. ARCHITECT SHALL SELECT FINISH DURING SUBMITTALS.	STEEL CITY
PT-2	LEGRAND	6AT EVOLUTION SERIES	4 GANG: (2) DUPLEX RECEPTACLES, (1) DATA, (1) HDMI/AV	RECESSED FLOOR BOX SUITABLE FOR POKE THRU APPLICATION. PROVIDE METAL COVER AND TRIM. ARCHITECT SHALL SELECT FINISH DURING SUBMITTALS.	STEEL CITY

NOTE:
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PROJECT NO:
24102

DATE:
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SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.01

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LIGHTING FIXTURE SCHEDULE

TYPE	BOD MANUFACTURER	MODEL NUMBER	DESCRIPTION	LAMP/CCT/CRI	CONTROL	DELIVERED LUMENS	WATTS	VOLTS	EQUALS
CA	KELVIX	UNI1-WL-I-200-35K-24DC	CUSTOM CONTINOUS RUN LED TAPE LIGHT CLIP MOUNTED WITH EXTRUDED ALUMINUM CONSTRUCTION.PROVIDE WITH CHANNEL MODEL CH-602-2-FR-CP-EC. VERIFY FIXTURE LENGTH WITH DESIGN TEAM DURING SUBMITALS.	LED/3500K/90CRI	NON.	292 lm/ft	1.7 w/ft	277	ENGINEER APPROVED EQUALS.
CB	KELVIX	UNI1-WL-I-200-35K-24DC	116 INCH CONTINOUS RUN LED TAPE LIGHT. UNIFORM STATIC WHITE OPTICS. PROVIDE WITH CHANNEL MODEL CH-502-A-4--FR-CP-EC. VERIFY FIXTURE LENGTH WITH DESIGN TEAM DURING SUBMITTALS.	LED/3500K/90CRI	NON.	292 lm/ft	1.7 w/ft	277	ENGINEER APPROVED EQUALS.
EA	LITHONIA	EDGR-1	SINGLE FACE RECESSED LED EDGE-LIT EXIT SIGN. EXTRUDED BRUSHED ALUMINUM FINISH. AC ONLY. ARCHITECT TO SELECT LETTERING COLOR DURING SUBMITTALS.	LED	NON.	-	4.5W	277	ENGINEER APPROVED EQUALS.
EB	LITHONIA	EDGR-2	DOUBLE FACED RECESSED LED EDGE-LIT EXIT SIGN. EXTRUDED BRUSHED ALUMINUM FINISH. AC ONLY. ARCHITECT TO SELECT LETTERING COLOR DURING SUBMITTALS.	LED	NON.	-	4.5W	277	ENGINEER APPROVED EQUALS.
DA	ALPHABET	NU6-RD-30LM-30K-80-60D-CL-WH-RET-UNV	6" RETOFITTED LED DOWNLIGHT.	LED/3000K/80CRI	NON.	3000 lm	24W	277	ENGINEER APPROVED EQUALS.
LA-12	3G LIGHTING	3G-1RLI-DC350-S80-35K-UNV-DIM-FL-S12'	12 FT RECESSED LED LINEAR WITH EXTRUDED ALUMINUM HOUSING. 0-10V DIMMABLE DRIVER. ARCHITECT TO SELECT FINISH DURING SUBMITTALS.	LED/3500K/80CRI	0-10V	350 lm/ft	3.3 W/ft	277	ENGINEER APPROVED EQUALS.
LA-18	3G LIGHTING	3G-1RLI-DC350-S80-35K-UNV-DIM-FL-S18'	18 FT RECESSED LED LINEAR WITH EXTRUDED ALUMINUM HOUSING. 0-10V DIMMABLE DRIVER. ARCHITECT TO SELECT FINISH DURING SUBMITTALS.	LED/3500K/80CRI	0-10V	350 lm/ft	3.3 W/ft	277	ENGINEER APPROVED EQUALS.
LA-20	3G LIGHTING	3G-1RLI-DC300-S80-35K-UNV-DIM-FL-S20'	20 FT RECESSED LED LINEAR WITH EXTRUDED ALUMINUM HOUSING. 0-10V DIMMABLE DRIVER. ARCHITECT TO SELECT FINISH DURING SUBMITTALS.	LED/3500K/80CRI	0-10V	300 lm/ft	2.8 W/ft	277	ENGINEER APPROVED EQUALS.
PA-4	HE WILLIAMS	7SR-4-L50-83S-DRV-UNV-VBY-2	4 FT PENDANT MOUNTED LED LINEAR WITH COLD-ROLLED STEEL CONSTRUCTION.	LED/3500K/80CRI	NON.	2,038	31.2W	277	COLUMBIA, METALUX, ENGINEER APPROVED EQUALS.
PB	LITECONTROL	88L-P-ID-4-STD-A2/180-WOL-XX-35K9-I050-D070-D01-1C-UNV-FA1	48 INCH PENDANT MOUNTED ROUND LED FIXTURE WITH EXTRUDED ALUMINUM CONSTRUCTION. 0-10V DIMMABLE DRIVER. ARCHITECT TO SELECT FINSIH DURING SUBMITTALS.	LED/3500K/80CRI	0-10V	500ID/700DI lm/ft	45.2W	277	ENGINEER APPROVED EQUALS.
PC	A LIGHT	PR22'-IC+DC-35K-80CRI-U-ASY+BW-S-X-1-X-EC-PF	22FT SUSPENDED LINEARS WITH A SQUARE PATTERN SHAPE. INTERGRAL PHOTOCELL DAYLIGHT SENSOR. ARCHITECT TO SELECT FINISH DURING SUBMITTALS	LED/3500K/80CRI	0-10V	500ID/750DI lm/ft	110 W/ft	277	ENGINEER APPROVED EQUALS.
RA-1	LITHONIA	2BLT2-33L-SDSM-MVOLT-GZ10-LP840	2'X2' RECESSED LED TROFFER WITH A 0-10V DIMMABLE DRIVER.	LED/3500K/80CRI	0-10V	3400 lm	26.5W	277	ENGINEER APPROVED EQUALS.
RA-2	LITHONIA	2BLT2-20L-SDSM-MVOLT-GZ10-LP840	2'X2' RECESSED LED TROFFER WITH A 0-10V DIMMABLE DRIVER.	LED/3500K/80CRI	0-10V	2100 lm	16.4W	277	ENGINEER APPROVED EQUALS.
RA-3	LITHONIA	2BLT2-48L-SDSM-MVOLT-GZ10-LP840	2'X2' RECESSED LED TROFFER WITH A 0-10V DIMMABLE DRIVER.	LED/3500K/80CRI	0-10V	5041 lm	42.9 W	277	ENGINEER APPROVED EQUALS.
RB	KENALL	RMCD-2-CZ-1/2-45L40K-DCC-DV-2/8	2'X2' RECESSED LED FIXTURE WITH COLD-ROLLED STEEL CONTRUCTION. PRISMATIC POLCARBONATE INNER LENS AND CLEAR TEMPERED GLASS OUT LENS. IK10 RATED.	LED/4000K/80CRI	0-10V	4164 lm	45W	277	ENGINEER APPROVED EQUALS.
WA	COLUMBIA	ESL-4-30-MLHE-FA-W-ED-U-ELL14-NXOS	4' WALL MOUNTED STAIRWELL LINEAR LED FIXTURE. WHITE STEEL HOUSING WITH ACRYLIC LENS WITH WIDE DISTRIBUTION. INTEGRAL 0-10V DIMMABLE DRIVER. INTEGRAL PIR OCCUPANCY SENSOR THAT AUTOMATICALLY DIMS FIXTURE WHEN NO OCCUPANCY IS DETECTED. INTEGRAL EMERGENCY BACKUP BATTERY.	LED/3000K/80CRI	0-10V	4461 lm	34 W	277	ENGINEER APPROVED EQUALS.
WB	LITHONIA	WEDGE2-P2-30K-80CRI-VW-MVOLT-SRM-PE-PIR	SURFACE MOUNTED LED EXTERIOR WALL PACK WITH DIE-CAST ALUMINUM CONSTRUCTION. BI-LEVEL INTEGRATED MOTION SENSOR WITH PHOTOCELL CONTROLS. VISUAL COMFORT WIDE DISTRIBUTION. ARCHTECT TO SELECT FINISH DURING SUBMITTALS.	LED/3000K/80CRI	0-10V	1997 lm	137 lm/w	277	ENGINEER APPROVED EQUALS.
WC	COLUMBIA	CWM-2'-35K-MW-SM-FR-FA-E-U	2' WALL MOUNTED FIXTURE WITH EXTRUDED ALUMINUM CONSTRUCTION. FROSTED RECTILINEAR LENS.	LED/3500K/80CRI	NON.	2013 lm	20 W	277	ENGINEER APPROVED EQUALS.

NOTES:

1. LINEAR FIXTURE ACTUAL LENGTH CONFIRM WITH CEILING SYSTEM FOR EXACT FIT.
2. PROVIDE ALL PARTS AND PIECES FOR A COMPLETE AND FULLY FUNCTIONAL LIGHTING SYSTEM.
3. CONTRACTOR SHALL INSTALL ALL FIXTURES PER MANUFACTURER RECOMMENDATIONS IN LOCATIONS SHOWN ON DRAWING AND NOTIFY DESIGN TEAM IF THIS IS NOT POSSIBLE PRIOR TO ROUGH-IN.
4. VERIFY ALL WALL MOUNTED FIXTURE LOCATIONS WITH THE LIGHTING DESIGNER AND ARCHITECT PRIOR TO ROUGH-IN.
5. ARCHITECT SHALL SELECT ALL FINISH/COLORS AT TIME OF SUBMITTAL.
6. COORDINATE ALL DRIVERS WITH CONTROLS TO INSURE FULL COMPATIBILITY.
7. VERIFY ALL FINAL CEILING TYPES AND MOUNTING CONFIGURATIONS PRIOR TO RELEASE OF FIXTURES.
8. PROVIDE LINE ITEM PRICING TO DISTRIBUTOR FOR INDIVIDUAL FIXTURE TYPES. LIGHT FIXTURE PACKAGE AND LIGHTING CONTROLS PACKAGE SHALL BE QUOTED SEPARATELY UNDER THEIR RESPECTIVE SPECIFICATION SECTIONS.
9. LIGHTING PRODUCTS SHALL BE PROVIDED THROUGH THE AUTHORIZED LIGHTING MANUFACTURER'S REPRESENTATIVE WITHIN THE PROJECT LOCATION.
10. SUBMITTALS SHALL BE PRODUCED AND SUBMITTED BY LOCAL AUTHORIZED LIGHTING MANUFACTURER'S REPRESENTATIVE. SUBMITTAL SHALL CONTAIN LETTERHEAD WITH REPRESENTATIVE'S CONTACT INFORMATION, PROJECT NAME, AND PROJECT LOCATION.

LIGHT FIXTURE SCHEDULE BY:
DARIUS WHALEY
DWHALEY@MODUS-ENG.COM

DANNY PHETMANYSAY
DPHETMANYSAY@MODUS-ENG.COM

LIGHTING CONTROL - SEQUENCE OF OPERATION

TAG	ACTIVATION	DESCRIPTION	SCHEDULE
A	MANUAL ON/ AUTO-OFF W/ DIMMING	MANUAL ON AND AUTO-OFF w/ WALL CONTROL, CEILING SENSOR(S) AND ROOM CONTROLLER(S). PROVIDE DAYLIGHT DIMMING, AS REQUIRED, ZONED, AND INDICATED ON PLANS.	30 MINUTE TIMEOUT
B	AUTO ON/ AUTO OFF	AUTO ON/AUTO OFF w/ WALL MOUNTED SENSOR OR CEILING MOUNTED SENSOR(S), AS APPROPRIATE.	30 MINUTE TIMEOUT
C	SCHEDULED ON/OFF - OCC. SENSOR AFTER HOURS	BUILDING SCHEDULE TRIGGERS ON/OFF. DURING BUSINESS HOURS, FIXTURES SHALL ALWAYS BE ON. DURING AFTER HOURS, FIXTURES SHALL BE CONTROLLED ON/OFF VIA OCCUPANCY SENSORS.	30 MINUTE TIMEOUT
D	MANUAL ON/ AUTO-OFF	MANUAL ON AND AUTO-OFF w/ WALL CONTROL, CEILING SENSOR(S) AND ROOM CONTROLLER(S).	30 MINUTE TIMEOUT
E	MANUAL ON/ AUTO-OFF w/ DIMMING	MANUAL ON AND AUTO-OFF w/ MULTI-ZONE WALL CONTROL, CEILING SENSORS AND ROOM CONTROLLER(S). DIMMING ZONES AS INDICATED ON PLANS. PROVIDE DAYLIGHT DIMMING, AS REQUIRED, ZONED, AND INDICATED ON PLANS.	30 MINUTE TIMEOUT
F	MANUAL ON/ OFF	MANUAL LINE VOLTAGE TOGGLE SWITCH	N/A
G	ALWAYS ON/DIM TO 10%	FIXTURE SHALL ALWAYS REMAIN ON. FIXTURE SHALL DIM DOWN TO 10% OF LUMEN OUTPUT UPON NO DETECTION AFTER 30 MINUTES. UPON DETECTION, FIXTURE SHALL BE 100% OF THE LUMEN OUTPUT. EACH STAIRWELL LIGHT FIXTURES SHALL BE CONTROLLED TOGETHER.	30 MINUTE TIMEOUT
H	ASTRONOMICAL TIMECLOCK SCHEDULING W/ PHOTOCELL OVERRIDE	ON/OFF VIA ASTRONOMICAL TIMECLOCK SCHEDULE. EXTERIOR PHOTOCELL OVERRIDE (SECONDARY COMMAND).	ON - 30 MINS BEFORE SUNSET OFF - 1 HOUR AFTER SUNRISE PHOTOCELL OVERRIDE - 1.25 HR AFTER SUNRISE - 29 MINS BEFORE SUNSET

NOTES:

1. REFER TO SPECIFICATION 26 0943 FOR FURTHER INFORMATION.
2. OCCUPANCY SENSORS SHALL BE PROGRAMMED FOR A 30 MINUTE TIME DELAY.
3. PROVIDE PROPER NUMBER OF POWER PACKS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM.
4. EXACT DEVICE AND POWER PACK QUANTITIES SHALL BE DETERMINED DURING CONSTRUCTION BY THE LIGHTING CONTROLS MANUFACTURER.
5. COORDINATE TIME CLOCK SCHEDULE WITH OWNER DURING COMMISSIONING.
6. COORDINATE EXTERIOR PHOTOCELL LOCATION WITH DESIGN TEAM PRIOR TO ROUGH-IN.
7. PROVIDE UL924 RATED TRANSFER DEVICE(S) IN ALL AREAS WHERE EMERGENCY EGRESS LIGHTING IS REQUIRED PER NFPA 101.LIGHTING CONTROLS MANUFACTURER SHALL DETERMINE EXACT QUANTITIES WITH LIGHTING CONTROL ZONES AND LAYOUTS.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.02

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Switchboard: EDG-M1

Location: EMERGENCY ELEC 1206
Supply From: GEN-CH
Mounting: Floor
Enclosure: NEMA 1
Available Fault Current: 6,598A

Volts: 480/277 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22,000A
Mains Type: MCB
Mains Rating: 1200A
MCB Rating: 1200A
SPD: INTERNAL

Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
EDGM1-1	ATS-OS1	3	1200 A	1200 A	1396097 VA	
EDGM1-2	ATS-E1	3	250 A	150 A	4432 VA	
EDGM1-3						
EDGM1-4						
EDGM1-5	ATS-C1	3	125 A	70 A	30100 VA	
EDGM1-6	SPD	3	125 A	30 A	0 VA	
EDGM1-7						
EDGM1-8						
EDGM1-9						
EDGM1-10						
EDGM1-11						
EDGM1-12						
EDGM1-13						
EDGM1-14						
EDGM1-15						
EDGM1-16						
EDGM1-17						
EDGM1-18						
EDGM1-19						
EDGM1-20						
				Total Conn. Load:	1430629 VA	
				Total Amps:	1721 A	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	12615 VA	100.00%	12615 VA		
Motor	6830 VA	114.60%	7828 VA	**Total Conn. Load:**	1430629 VA
Power	29940 VA	100.00%	29940 VA	**Total Est. Demand:**	777630 VA
Heating	516719 VA	1.00%	5167 VA	**Total Conn. Current:**	1721 A
Cooling	470032 VA	100.00%	470032 VA	**Total Est. Demand Current:**	935 A
Receptacles	309620 VA	51.61%	159810 VA		
Water Heater	180 VA	125.00%	225 VA		
Elevator	43212 VA	100.00%	43212 VA		
Lighting - Exterior	0 VA	0.00%	0 VA		
Equipment	360 VA	50.00%	180 VA		
Lighting	30002 VA	125.00%	37502 VA		
Receptacle	11120 VA	100.00%	11120 VA		

Notes:

Distribution Panel: HDN-M1

Location: ELECTRICAL 1205
Supply From: EX UTILITY XMFR
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 20,397A

Volts: 480/277 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 42,000A
Mains Type: MCB
Mains Rating: 1200A
MCB Rating: 1200A
SPD: EXTERNAL

Notes: EXISTING GENERAL ELECTRIC SPECTRA SERIES APN PLUG-IN STYLE DISTRIBUTION BOARD.

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
HDNM1-1	ATS-C1	3	125 A	70 A	30100 VA	
HDNM1-2	ATS-E1	3	250 A	150 A	4432 VA	
HDNM1-3	ATS-OS1	3	1200 A	1200 A	1396097 VA	
HDNM1-4						
HDNM1-5						
HDNM1-6						
HDNM1-7						
HDNM1-8						
HDNM1-9						
HDNM1-10						
HDNM1-11						
HDNM1-12						
HDNM1-13						
HDNM1-14						
HDNM1-15	NEW SPD	3	125 A	60 A	0 VA	
HDNM1-16						
HDNM1-17						
HDNM1-18						
HDNM1-19						
HDNM1-20						
				Total Conn. Load:	1430629 VA	
				Total Amps:	1721 A	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	12615 VA	100.00%	12615 VA		
Motor	6830 VA	114.60%	7828 VA	**Total Conn. Load:**	1430629 VA
Power	29940 VA	100.00%	29940 VA	**Total Est. Demand:**	777630 VA
Heating	516719 VA	1.00%	5167 VA	**Total Conn. Current:**	1721 A
Cooling	470032 VA	100.00%	470032 VA	**Total Est. Demand Current:**	935 A
Receptacles	309620 VA	51.61%	159810 VA		
Water Heater	180 VA	125.00%	225 VA		
Elevator	43212 VA	100.00%	43212 VA		
Lighting - Exterior	0 VA	0.00%	0 VA		
Equipment	360 VA	50.00%	180 VA		
Lighting	30002 VA	125.00%	37502 VA		
Receptacle	11120 VA	100.00%	11120 VA		

Notes:
MAX SUMMER ESTIMATED DEMAND CURRENT: 923A
MAX WINTER ESTIMATED DEMAND CURRENT: 972A

Panel: HDE-M1

Location: EMERGENCY ELEC 1206
Supply From: ATS-E1
Mounting: Surface
Enclosure: Type 1
Available Isc: 15,380A

Volts: 480/277 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MCB
Mains Rating: 150A
MCB Rating: 150A
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
HDEM1-1	HE-S1	N	100 A	3	4432	--					1	--		SPACE	HDEM1-2
HDEM1-3	--		--	--			0	--			1	--		SPACE	HDEM1-4
HDEM1-5	--		--	--					0	--	1	--		SPACE	HDEM1-6
HDEM1-7	SPARE		20 A	1	0	--					1	--		SPACE	HDEM1-8
HDEM1-9	SPARE		20 A	1			0	--			1	--		SPACE	HDEM1-10
HDEM1-11	SPARE		20 A	1					0	--	1	--		SPACE	HDEM1-12
HDEM1-13	SPARE		20 A	1	0	--					1	--		SPACE	HDEM1-14
HDEM1-15	SPARE		20 A	1			0	--			1	--		SPACE	HDEM1-16
HDEM1-17	SPARE		20 A	1					0	--	1	--		SPACE	HDEM1-18
HDEM1-19	SPD		--	1	--	--					1	--		SPD	HDEM1-20
HDEM1-21	SPD		--	1			--	--			1	--		SPD	HDEM1-22
HDEM1-23	SPD		--	1					--	--	1	--		SPD	HDEM1-24
HDEM1-25	SPD		--	1	--	--					1	--		SPD	HDEM1-26
HDEM1-27	SPD		--	1			--	--			1	--		SPD	HDEM1-28
HDEM1-29	SPD		--	1					--	--	1	--		SPD	HDEM1-30
			Total Load:		4432 VA		0 VA		0 VA						
			Total Amps:		16 A		0 A		0 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	4432 VA	125.00%	5540 VA		
				Total Conn. Load:	4.4 kVA
				Total Est. Demand:	5.5 kVA
				Total Conn. Current:	5 A
				Total Est. Demand Current:	7 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CONSULTANT:
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IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.03

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Switchboard: HDOS-M1

Location: EMERGENCY ELEC 1206
Supply From: ATS-OS1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 20,306A

Volts: 480/277 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 42,000A
Mains Type: MCB
Mains Rating: 1200A
MCB Rating: 1200A
SPD: INTERNAL

Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
HDOSM1-1	T-OS1	3	400 A	350 A	336827 VA	
HDOSM1-2	HOS-M1	3	400 A	250 A	202741 VA	
HDOSM1-3	HOS-S1	3	400 A	250 A	157737 VA	
HDOSM1-4	HOS-T1	3	400 A	250 A	220800 VA	
HDOSM1-5	RTU-2	3	400 A	250 A	152904 VA	
HDOSM1-6	RTU-1	3	400 A	250 A	152904 VA	
HDOSM1-7	RTU-3	3	400 A	225 A	128971 VA	
HDOSM1-8	ELEV-1	3	250 A	80 A	43212 VA	
HDOSM1-9						
HDOSM1-10	SPD	3	125 A	30 A	0 VA	
HDOSM1-11						
HDOSM1-12						
HDOSM1-13						
HDOSM1-14						
HDOSM1-15						
HDOSM1-16						
HDOSM1-17						
HDOSM1-18						
HDOSM1-19						
HDOSM1-20						
				Total Conn. Load:	1396097 VA	
				Total Amps:	1679 A	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	12615 VA	100.00%	12615 VA		
Motor	6830 VA	114.60%	7828 VA	**Total Conn. Load:**	1396097 VA
Power	18920 VA	100.00%	18920 VA	**Total Est. Demand:**	751530 VA
Heating	516719 VA	1.00%	5167 VA	**Total Conn. Current:**	1679 A
Cooling	470032 VA	100.00%	470032 VA	**Total Est. Demand Current:**	904 A
Receptacles	290540 VA	51.72%	150270 VA		
Water Heater	180 VA	125.00%	225 VA		
Elevator	43212 VA	100.00%	43212 VA		
Lighting - Exterior	0 VA	0.00%	0 VA		
Equipment	360 VA	50.00%	180 VA		
Lighting	25570 VA	125.00%	31962 VA		
Receptacle	11120 VA	100.00%	11120 VA		

Notes:
MAX SUMMER ESTIMATED DEMAND CURRENT: 892A
MAX COOLING ESTIMATED DEMAND CURRENT: 941A

Switchboard: LDOS-M1

Location: EMERGENCY ELEC 1206
Supply From: T-OS1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 40,232A

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 42,000A
Mains Type: MCB
Mains Rating: 800A
MCB Rating: 800A
SPD: INTERNAL

Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
LDOSM1-1	INV1	3	400 A	225 A	0 VA	PART OF ALTERNATE #1
LDOSM1-2	LBOS-S2	3	400 A	225 A	67282 VA	
LDOSM1-3	LOS-M3	3	400 A	225 A	59796 VA	
LDOSM1-4	LOS-S1	3	400 A	225 A	45140 VA	
LDOSM1-5	LOS-T2	3	400 A	225 A	43034 VA	
LDOSM1-6	GEN-LC	2	400 A	60 A	3000 VA	
LDOSM1-7	LOS-T1	3	400 A	225 A	50674 VA	
LDOSM1-8	LOS-M2	3	400 A	225 A	27000 VA	
LDOSM1-9	LOS-M1	3	400 A	225 A	40900 VA	
LDOSM1-10	SPD	3	400 A	30 A	0 VA	
LDOSM1-11						
LDOSM1-12						
LDOSM1-13						
LDOSM1-14						
LDOSM1-15						
LDOSM1-16						
LDOSM1-17						
LDOSM1-18						
LDOSM1-19						
LDOSM1-20						
				Total Conn. Load:	336827 VA	
				Total Amps:	935 A	

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	216 VA	100.00%	216 VA		
Motor	182 VA	125.00%	228 VA	**Total Conn. Load:**	336827 VA
Power	18920 VA	100.00%	18920 VA	**Total Est. Demand:**	196468 VA
Cooling	15309 VA	100.00%	15309 VA	**Total Conn. Current:**	935 A
Receptacles	290540 VA	51.72%	150270 VA	**Total Est. Demand Current:**	545 A
Water Heater	180 VA	125.00%	225 VA		
Elevator	0 VA	0.00%	0 VA		
Equipment	360 VA	50.00%	180 VA		
Receptacle	11120 VA	100.00%	11120 VA		

Notes:

Switchboard: LDC-M1

Location: EMERGENCY ELEC 1206
Supply From: T-C1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 30,782A

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 42,000A
Mains Type: MCB
Mains Rating: 150A
MCB Rating: 150A
SPD: INTERNAL

Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
LDCM1-1	LC-M1	3	400 A	100 A	17640 VA	
LDCM1-2	UPS	3	400 A	125 A	12460 VA	
LDCM1-3	NEW SPD	3	400 A	30 A	0 VA	
LDCM1-4						
LDCM1-5						
LDCM1-6						
LDCM1-7						
LDCM1-8						
LDCM1-9						
LDCM1-10						
LDCM1-11						
LDCM1-12						
LDCM1-13						
LDCM1-14						
LDCM1-15						
LDCM1-16						
LDCM1-17						
LDCM1-18						
LDCM1-19						
LDCM1-20						
				Total Conn. Load:	30100 VA	
				Total Amps:	84 A	

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	11020 VA	100.00%	11020 VA		
Receptacles	19080 VA	76.21%	14540 VA	**Total Conn. Load:**	30100 VA
				Total Est. Demand:	25560 VA
				Total Conn. Current:	84 A
				Total Est. Demand Current:	71 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.04

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Panel: HOS-S1

Location: CIRCULATION 2002
Supply From: HDOS-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current: 14,161A

Volts: 480/277 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MLO
Mains Rating: 250A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
HOSS1-1	VAV-2114	N	20 A	1	3989	5318					1	25 A	N	VAV-2113	HOSS1-2
HOSS1-3	VAV-2101	N	25 A	1			5318	9972			1	50 A	N	VAV-2102	HOSS1-4
HOSS1-5	VAV-2103	N	50 A	1					9972	2659	1	15 A	N	VAV-2110	HOSS1-6
HOSS1-7	VAV-2107	N	40 A	1	7978	3989					1	20 A	N	VAV-2108	HOSS1-8
HOSS1-9	VAV-2201	N	30 A	1			6426	5318			1	25 A	N	VAV-2200A	HOSS1-10
HOSS1-11	VAV-2207	N	35 A	1					6870	3501	1	20 A	N	VAV-2204	HOSS1-12
HOSS1-13	VAV-2210	N	60 A	1	12853	6426					1	30 A	N	VAV-2218	HOSS1-14
HOSS1-15	VAV-2220	N	15 A	1			3501	6426			1	30 A	N	VAV-2216	HOSS1-16
HOSS1-17	VAV-2215	N	30 A	1					6426	4432	1	25 A	N	VAV-2200C	HOSS1-18
HOSS1-19	VAV-2213	N	50 A	1	9972	7091					1	35 A	N	VAV-2200B	HOSS1-20
HOSS1-21	VAV-2209	N	25 A	1			5318	3501			1	20 A	N	VAV-2217	HOSS1-22
HOSS1-23	VAV-2006	N	25 A	1					5318	2940	1	20 A	N	LIGHTING	HOSS1-24
HOSS1-25	LIGHTING	N	20 A	1	2435	1108					3	15 A	N	AC-2	HOSS1-26
HOSS1-27	LIGHTING	N	20 A	1			3137	1108			--	--		--	HOSS1-28
HOSS1-29	AC-1	N	15 A	3					1108	1108	--	--		--	HOSS1-30
HOSS1-31	--		--	--	1108	--					1	--		SPACE	HOSS1-32
HOSS1-33	--		--	--			1108	--			1	--		SPACE	HOSS1-34
HOSS1-35	SPARE	N	20 A	1					0	--	1	--		SPACE	HOSS1-36
HOSS1-37	SPARE	N	20 A	1	0	--					1	--		SPACE	HOSS1-38
HOSS1-39	SPARE	N	20 A	1			0	--			1	--		SPACE	HOSS1-40
HOSS1-41	SPARE	N	20 A	1					0	--	1	--		SPACE	HOSS1-42
HOSS1-43	SPD		--	1	--	--					1	--		SPD	HOSS1-44
HOSS1-45	SPD		--	1			--	--			1	--		SPD	HOSS1-46
HOSS1-47	SPD		--	1					--	--	1	--		SPD	HOSS1-48
HOSS1-49	SPD		--	1	--	--					1	--		SPD	HOSS1-50
HOSS1-51	SPD		--	1			--	--			1	--		SPD	HOSS1-52
HOSS1-53	SPD		--	1					--	--	1	--		SPD	HOSS1-54
				Total Load:	62267 VA		51135 VA		44335 VA						
				Total Amps:	229 A		188 A		160 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Heating	142577 VA	1.00%	1426 VA		
Cooling	6648 VA	100.00%	6648 VA	**Total Conn. Load:**	157.7 kVA
Lighting	8512 VA	125.00%	10640 VA	**Total Est. Demand:**	18.7 kVA
				Total Conn. Current:	190 A
				Total Est. Demand Current:	23 A

Notes:
MAX SUMMER ESTIMATED DEMAND CURRENT: 23A
MAX COOLING ESTIMATED DEMAND CURRENT: 184A

Panel: HOS-M1

Location: CORRIDOR 1306
Supply From: HDOS-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current: 15,384A

Volts: 480/277 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MLO
Mains Rating: 400A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
HOSM1-1	VAV-1323	N	25 A	1	5318	5318					1	25 A	N	VAV-1317	HOSM1-2
HOSM1-3	VAV-1316	N	50 A	1			9972	2659			1	15 A	N	VAV-1314	HOSM1-4
HOSM1-5	VAV-1315	N	30 A	1					6426	9972	1	50 A	N	VAV-1309	HOSM1-6
HOSM1-7	VAV-1313	N	30 A	1	6426	2659					1	15 A	N	VAV-1308	HOSM1-8
HOSM1-9	VAV-1310	N	15 A	1			2659	5318			1	20 A	N	VAV-1306	HOSM1-10
HOSM1-11	VAV-1304B	N	60 A	1					12853	12853	1	60 A	N	VAV-1304A	HOSM1-12
HOSM1-13	VAV-1303	N	60 A	1	12853	3546					1	20 A	N	VAV-1300	HOSM1-14
HOSM1-15	VAV-1302	N	25 A	1			5318	1690			3	15 A	N	EUH-1	HOSM1-16
HOSM1-17	ECUH-1	N	15 A	3					1667	1690	--	--		--	HOSM1-18
HOSM1-19	--		--	--	1667	1690					--	--		--	HOSM1-20
HOSM1-21	--		--	--			1667	1667			3	15 A	N	ECUH-1	HOSM1-22
HOSM1-23	VAV-1322	N	50 A	1					9972	1667	--	--		--	HOSM1-24
HOSM1-25	VAV-1328	N	50 A	1	9972	1667					--	--		--	HOSM1-26
HOSM1-27	VAV-1325	N	20 A	1			3501	2659			1	15 A	N	VAV-1201	HOSM1-28
HOSM1-29	VAV-1200	N	25 A	1					5318	6426	1	30 A	N	VAV-1041	HOSM1-30
HOSM1-31	VAV-1207	N	20 A	1	4377	6870					1	35 A	N	VAV-1001	HOSM1-32
HOSM1-33	VAV-1327	N	25 A	1			5318	1891			1	20 A	N	Lighting	HOSM1-34
HOSM1-35	LIGHTING	N	20 A	1					1816	1773	1	20 A	N	HOUSING AUTH. LTS	HOSM1-36
HOSM1-37	EBIKES/SERVICE/LOCK RM LTS	N	20 A	1	1205	1446					1	20 A	N	Lighting	HOSM1-38
HOSM1-39	EF-5	N	15 A	3			886	2161			3	15 A	N	ECUH-1	HOSM1-40
HOSM1-41	--		--	--					886	2161	--	--		--	HOSM1-42
HOSM1-43	--		--	--	886	2161					--	--		--	HOSM1-44
HOSM1-45	VAV-1204	N	30 A	1			6426	1667			3	15 A	N	ECUH-1	HOSM1-46
HOSM1-47	Lighting	N	20 A	1					204	1667	--	--		--	HOSM1-48
HOSM1-49	Lighting	N	20 A	1	204	1667					--	--		--	HOSM1-50
HOSM1-51	EXTERIOR LIGHTING	N	20 A	1			0	--			1	--		SPACE	HOSM1-52
HOSM1-53	SPARE	N	20 A	1					0	--	1	--		SPACE	HOSM1-54
HOSM1-55	SPARE	N	20 A	1	0	--					1	--		SPACE	HOSM1-56
HOSM1-57	SPARE	N	20 A	1			0	--			1	--		SPACE	HOSM1-58
HOSM1-59	SPD		--	1					--	--	1	--		SPD	HOSM1-60
HOSM1-61	SPD		--	1	--	--					1	--		SPD	HOSM1-62
HOSM1-63	SPD		--	1			--	--			1	--		SPD	HOSM1-64
HOSM1-65	SPD		--	1					--	--	1	--		SPD	HOSM1-66
HOSM1-67	SPD		--	1	--	--					1	--		SPD	HOSM1-68
HOSM1-69	SPD		--	1			--	--			1	--		SPD	HOSM1-70
HOSM1-71	SPD		--	1					--	--	1	--		SPD	HOSM1-72
				Total Load:	69931 VA		55460 VA		77351 VA						
				Total Amps:	261 A		200 A		287 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	5318 VA	100.00%	5318 VA		
Motor	2659 VA	125.00%	3324 VA	**Total Conn. Load:**	202.7 kVA
Heating	186225 VA	1.00%	1862 VA	**Total Est. Demand:**	21.2 kVA
Lighting - Exterior	0 VA	0.00%	0 VA	**Total Conn. Current:**	244 A
Lighting	8539 VA	125.00%	10674 VA	**Total Est. Demand Current:**	25 A

Notes:
MAX SUMMER ESTIMATED DEMAND CURRENT: 25A
MAX WINTER ESTIMATED DEMAND CURRENT: 247A

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.05

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Panel: LC-M1

Location: CORRIDOR 1306
Supply From: LDC-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current:

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 100A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LCM1-1	BRIEFING RM RECEPTS	N	20 A	1	720	1080					1	20 A	N	INTERVIEW 1311 RECEPTS	LCM1-2
LCM1-3	OWI PROCESS RECEPTS	N	20 A	1			540	720			1	20 A	N	BRIEFING RM RECEPTS	LCM1-4
LCM1-5	PATROL BAY RECEPTS	N	20 A	1					900	1080	1	20 A	N	PATROL BAY RECEPTS	LCM1-6
LCM1-7	PATROL BAY RECEPTS	N	20 A	1	1080	720					1	20 A	N	PATROL BAY RECEPTS	LCM1-8
LCM1-9	PATROL LT OFFICE RECEPTS	N	20 A	1			720	900			1	20 A	N	CORRIDOR 1306/VESTIBULE 1305 RECEPTS	LCM1-10
LCM1-11	BODY CAM	N	20 A	1					900	900	1	20 A	N	BODY CAM	LCM1-12
LCM1-13	BODY CAM	N	20 A	1	900	900					1	20 A	N	BODY CAM	LCM1-14
LCM1-15	BODY CAM	N	20 A	1			900	900			1	20 A	N	BRIEFING RM RECEPTS	LCM1-16
LCM1-17	PATROL BAY RECEPTS	N	20 A	1					900	900	1	20 A	N	PATROL BAY RECEPTS	LCM1-18
LCM1-19	FRIDGE	N	20 A	1	180	720					1	20 A	N	PATROL BAY RECEPTS	LCM1-20
LCM1-21	OWI PROCESS RECEPTS	N	20 A	1			540	--			1	--		SPACE	LCM1-22
LCM1-23	PATROL LT OFFICE RECEPTS	N	20 A	1					540	--	1	--		SPACE	LCM1-24
LCM1-25	SPARE	N	20 A	1	0	--					1	--		SPACE	LCM1-26
LCM1-27	SPARE	N	20 A	1			0	--			1	--		SPACE	LCM1-28
LCM1-29	SPARE	N	20 A	1					0	--	1	--		SPACE	LCM1-30
LCM1-31	SPD		--	1	--	--					1	--		SPD	LCM1-32
LCM1-33	SPD		--	1			--	--			1	--		SPD	LCM1-34
LCM1-35	SPD		--	1					--	--	1	--		SPD	LCM1-36
LCM1-37	SPD		--	1	--	--					1	--		SPD	LCM1-38
LCM1-39	SPD		--	1			--	--			1	--		SPD	LCM1-40
LCM1-41	SPD		--	1					--	--	1	--		SPD	LCM1-42
				Total Load:	6300 VA		5220 VA		6120 VA						
				Total Amps:	54 A		44 A		52 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Receptacles	17640 VA	78.34%	13820 VA		
				Total Conn. Load:	17.6 kVA
				Total Est. Demand:	13.8 kVA
				Total Conn. Current:	49 A
				Total Est. Demand Current:	38 A

Notes:

Panel: HOS-T1

Location:
Supply From: HDOS-M1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 13,583A

Volts: 480/277 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MLO
Mains Rating: 400A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
HOST1-1	VAV-3602B	N	40 A	1	7978	12853					1	60 A	N	VAV-3601A	HOST1-2
HOST1-3	VAV-3601B	N	60 A	1			12853	4432			1	25 A	N	VAV-3602A	HOST1-4
HOST1-5	VAV-3603	N	50 A	1					9972	6426	1	30 A	N	VAV-3000B	HOST1-6
HOST1-7	VAV-3002	N	25 A	1	5318	0					1	20 A		SPARE	HOST1-8
HOST1-9	VAV-3103	N	20 A	1			3501	3501			1	20 A	N	VAV-3104	HOST1-10
HOST1-11	VAV-3201	N	35 A	1					6870	2659	1	15 A	N	VAV-3106	HOST1-12
HOST1-13	VAV-3100	N	20 A	1	3501	2659					1	15 A	N	VAV-3109	HOST1-14
HOST1-15	VAV-3204	N	15 A	1			2659	2659			1	15 A	N	VAV-3205	HOST1-16
HOST1-17	VAV-3200A	N	25 A	1					5318	3501	1	20 A	N	VAV-3210	HOST1-18
HOST1-19	VAV-3200B	N	20 A	1	3989	6426					1	30 A	N	VAV-3207	HOST1-20
HOST1-21	VAV-3208	N	25 A	1			5318	5318			1	25 A	N	VAV-3309	HOST1-22
HOST1-23	VAV-3307	N	50 A	1					9972	10858	1	50 A	N	VAV-3301	HOST1-24
HOST1-25	VAV-3304	N	20 A	1	3501	5318					1	25 A	N	VAV-3606	HOST1-26
HOST1-27	VAV-3402	N	15 A	1			2659	10858			1	50 A	N	VAV-3403	HOST1-28
HOST1-29	VAV-3501	N	25 A	1					5318	5318	1	25 A	N	VAV-3504	HOST1-30
HOST1-31	VAV-3000A	N	30 A	1	6426	9972					1	50 A	N	VAV-3600	HOST1-32
HOST1-33	LIGHTING	N	20 A	1			1925	2418			1	20 A	N	LIGHTING	HOST1-34
HOST1-35	LIGHTING	N	20 A	1					2170	2005	1	20 A	N	LIGHTING	HOST1-36
HOST1-37	EF-1	N	15 A	3	310	720					3	15 A	N	EF-4	HOST1-38
HOST1-39	--		--	--			310	720			--	--		--	HOST1-40
HOST1-41	--		--	--					310	720	--	--		--	HOST1-42
HOST1-43	ACCU-1		15 A	3	2216	2216					3	15 A	N	ACCU-2	HOST1-44
HOST1-45	--		--	--			2216	2216			--	--		--	HOST1-46
HOST1-47	--		--	--					2216	2216	--	--		--	HOST1-48
HOST1-49	EX ATRIUM FAN	N	15 A	3	1330	1330					3	15 A	N	EX ATRIUM FAN	HOST1-50
HOST1-51	--		--	--			1330	1330			--	--		--	HOST1-52
HOST1-53	--		--	--					1330	1330	--	--		--	HOST1-54
HOST1-55	SPARE	N	20 A	1	0	--					1	--	N	SPACE	HOST1-56
HOST1-57	SPARE	N	20 A	1			0	--			1	--	N	SPACE	HOST1-58
HOST1-59	SPARE	N	20 A	1					0	--	1	--	N	SPACE	HOST1-60
HOST1-61	SPD		--	1	--	--					1	--		SPD	HOST1-62
HOST1-63	SPD		--	1			--	--			1	--		SPD	HOST1-64
HOST1-65	SPD		--	1					--	--	1	--		SPD	HOST1-66
HOST1-67	SPD		--	1	--	--					1	--		SPD	HOST1-68
HOST1-69	SPD		--	1			--	--			1	--		SPD	HOST1-70
HOST1-71	SPD		--	1					--	--	1	--		SPD	HOST1-72
				Total Load:	76064 VA		66225 VA		78511 VA						
				Total Amps:	280 A		239 A		289 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	7080 VA	100.00%	7080 VA		
Motor	3989 VA	125.00%	4986 VA	**Total Conn. Load:**	220.8 kVA
Heating	187917 VA	1.00%	1879 VA	**Total Est. Demand:**	37.9 kVA
Cooling	13296 VA	100.00%	13296 VA	**Total Conn. Current:**	266 A
Lighting	8519 VA	125.00%	10648 VA	**Total Est. Demand Current:**	46 A

Notes:
MAX SUMMER ESTIMATED DEMAND CURRENT: 46A
MAX WINTER ESTIMATED DEMAND CURRENT: 253A

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.06

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BRANCH HE-S1

Location: CIRCULATION 2002
Supply From: HDE-M1
Mounting: Recessed
Enclosure: Type 1
Available Isc:

Volts: 480/277 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 100A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
HES1-1	EMER LTS 1ST AND 2ND	N	20 A	1	2216	2216					1	20 A	N	EMER LTS 3RD	HES1-2
HES1-3	SPARE		20 A	1			0	--			1	--		SPACE	HES1-4
HES1-5	SPARE		20 A	1					0	--	1	--		SPACE	HES1-6
HES1-7	SPARE		20 A	1	0	--					1	--		SPACE	HES1-8
HES1-9	SPARE		20 A	1			0	--			1	--		SPACE	HES1-10
HES1-11	SPARE		20 A	1					0	--	1	--		SPACE	HES1-12
HES1-13	SPARE		20 A	1	0	--					1	--		SPACE	HES1-14
HES1-15	SPARE		20 A	1			0	--			1	--		SPACE	HES1-16
HES1-17	SPARE		20 A	1					0	--	1	--		SPACE	HES1-18
HES1-19	SPD		--	1	--	--					1	--		SPD	HES1-20
HES1-21	SPD		--	1			--	--			1	--		SPD	HES1-22
HES1-23	SPD		--	1					--	--	1	--		SPD	HES1-24
HES1-25	SPD		--	1	--	--					1	--		SPD	HES1-26
HES1-27	SPD		--	1			--	--			1	--		SPD	HES1-28
HES1-29	SPD		--	1					--	--	1	--		SPD	HES1-30
				Total Load:	4432 VA		0 VA		0 VA						
				Total Amps:	16 A		0 A		0 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	4432 VA	125.00%	5540 VA		
				Total Conn. Load:	4.4 kVA
				Total Est. Demand:	5.5 kVA
				Total Conn. Current:	5 A
				Total Est. Demand Current:	7 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.07

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Panel: LOS-M1

Location: EMERGENCY ELEC 1206
Supply From: LDOS-M1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 29,374A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 42,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOSM1-1	OFFICE 1204 RECEPTS	N	20 A	1	900	900					1	20 A	N	OFFICE 1203 RECEPTS	LOSM1-2
LOSM1-3	MAIL ROOM 1100/EXT. RECEPTS	N	20 A	1			900	720			1	20 A	N	LOBBY 1001 RECEPTS	LOSM1-4
LOSM1-5	OFFICE 1202 RECEPTS	N	20 A	1					900	900	1	20 A	N	OFFICE 1201 RECEPTS	LOSM1-6
LOSM1-7	OFFICE 1207 RECEPTS	N	20 A	1	1080	900					1	20 A	N	RECORDS STOR. RECEPTS	LOSM1-8
LOSM1-9	LOBBY 1001 RECEPTS	N	20 A	1			540	1260			1	20 A	N	RECORDS 1328 RECEPTS	LOSM1-10
LOSM1-11	RECORDS 1328 RECEPTS	N	20 A	1					540	900	1	20 A	N	OFFICE 1329 RECEPTS	LOSM1-12
LOSM1-13	OFFICE 1329 RECEPTS	N	20 A	1	720	1080					1	20 A	N	DETECTIVE LT OFFICE RECEPTS	LOSM1-14
LOSM1-15	WAITING 1327 RECEPTS	N	20 A	1			720	900			1	20 A	N	FILE/TLT 1209/JAN 1003/ PLAY 1041 RECEPTS	LOSM1-16
LOSM1-17	EXISTING SUMP PUMP	G	20 A	1					180	180	1	20 A	G	PIT RECEPT	LOSM1-18
LOSM1-19	CONV. RECEPTS	N	20 A	1	360	180					1	20 A	N	PLINTH RECEPT	LOSM1-20
LOSM1-21	OFFICE 1329 RECEPTS	N	20 A	1			360	1920			1	20 A	N	FURNITURE INFEED	LOSM1-22
LOSM1-23	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSM1-24
LOSM1-25	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOSM1-26
LOSM1-27	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOSM1-28
LOSM1-29	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSM1-30
LOSM1-31	OPEN OFFICE 1200 RECEPTS	N	20 A	1	360	1920					1	20 A	N	FURNITURE INFEED	LOSM1-32
LOSM1-33	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOSM1-34
LOSM1-35	ELEC. 1205/1206 RECEPTS	N	20 A	1					720	540	1	20 A	N	OPEN OFFICE 1200 RECEPTS	LOSM1-36
LOSM1-37	DOOR POWER	N	20 A	1	1080	--					1	--		SPACE	LOSM1-38
LOSM1-39	1209 TLT. SENSORS	N	20 A	1			40	--			1	--		SPACE	LOSM1-40
LOSM1-41	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSM1-42
LOSM1-43	SPD		--	1	--	--					1	--		SPD	LOSM1-44
LOSM1-45	SPD		--	1			--	--			1	--		SPD	LOSM1-46
LOSM1-47	SPD		--	1					--	--	1	--		SPD	LOSM1-48
LOSM1-49	SPD		--	1	--	--					1	--		SPD	LOSM1-50
LOSM1-51	SPD		--	1			--	--			1	--		SPD	LOSM1-52
LOSM1-53	SPD		--	1					--	--	1	--		SPD	LOSM1-54
					Total Load:	13320 VA		15040 VA		12540 VA					
					Total Amps:	112 A		126 A		105 A					

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	2560 VA	100.00%	2560 VA		
Receptacles	37800 VA	63.23%	23900 VA	**Total Conn. Load:**	40.9 kVA
Receptacle	540 VA	100.00%	540 VA	**Total Est. Demand:**	27.0 kVA
				Total Conn. Current:	114 A
				Total Est. Demand Current:	75 A

Notes:

Panel: LOS-M2

Location: CIRCULATION 1326
Supply From: LDOS-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current: 8,810A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOSM2-1	EX RECEPTS	N	20 A	1	360	900					1	20 A	N	DETECTIVES BAY RECEPTS	LOSM2-2
LOSM2-3	SRO OFFICE 1324 RECEPTS	N	20 A	1			1080	720			1	20 A	N	CIRC. 1326/DET. STOR. 1323 RECEPTS	LOSM2-4
LOSM2-5	DETECTIVES BAY RECEPTS	N	20 A	1					720	720	1	20 A	N	DETECTIVES BAY RECEPTS	LOSM2-6
LOSM2-7	INTERVIEW 1320 RECEPTS	N	20 A	1	900	900					1	20 A	N	INTERVIEW 1319 RECEPTS	LOSM2-8
LOSM2-9	INTERVIEW 1318 RECEPTS	N	20 A	1			900	900			1	20 A	N	INTERVIEW 1317 RECEPTS	LOSM2-10
LOSM2-11	VCAT RECEPTS	N	20 A	1					1080	900	1	20 A	N	DETECTIVES BAY RECEPTS	LOSM2-12
LOSM2-13	DETECTIVES BAY RECEPTS	N	20 A	1	720	540					1	20 A	N	VCAT AND CORR. RECEPTS	LOSM2-14
LOSM2-15	DETECTIVES BAY RECEPTS	N	20 A	1			540	1920			1	20 A	N	FURNITURE INFEED	LOSM2-16
LOSM2-17	FURNITURE INFEED	N	20 A	1					1920	1620	1	20 A	N	VCAT RECEPTS	LOSM2-18
LOSM2-19	PATROL SGT. ROOM RECEPTS	N	20 A	1	1080	720					1	20 A	N	VCAT RECEPTS	LOSM2-20
LOSM2-21	PATROL SGT. ROOM RECEPTS	N	20 A	1			1260	1260			1	20 A	N	PATROL SGT. ROOM RECEPTS	LOSM2-22
LOSM2-23	FURNITURE INFEED	N	20 A	1					1920	720	1	20 A	N	EX RECEPTS	LOSM2-24
LOSM2-25	CORRIDOR RECEPTS	N	20 A	1	540	720					1	20 A	N	VCAT RECEPTS	LOSM2-26
LOSM2-27	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSM2-28
LOSM2-29	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSM2-30
LOSM2-31	SPARE	N	20 A	1	0	--					1	--		SPACE	LOSM2-32
LOSM2-33	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSM2-34
LOSM2-35	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSM2-36
LOSM2-37	SPARE	N	20 A	1	0	--					1	--		SPACE	LOSM2-38
LOSM2-39	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSM2-40
LOSM2-41	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSM2-42
LOSM2-43	SPD		--	1	--	--					1	--		SPD	LOSM2-44
LOSM2-45	SPD		--	1			--	--			1	--		SPD	LOSM2-46
LOSM2-47	SPD		--	1					--	--	1	--		SPD	LOSM2-48
LOSM2-49	SPD		--	1	--	--					1	--		SPD	LOSM2-50
LOSM2-51	SPD		--	1			--	--			1	--		SPD	LOSM2-52
LOSM2-53	SPD		--	1					--	--	1	--		SPD	LOSM2-54
					Total Load:	8820 VA		8580 VA		9600 VA					
					Total Amps:	74 A		72 A		80 A					

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	1620 VA	100.00%	1620 VA		
Receptacles	25380 VA	69.70%	17690 VA	**Total Conn. Load:**	27.0 kVA
				Total Est. Demand:	19.3 kVA
				Total Conn. Current:	75 A
				Total Est. Demand Current:	54 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CONSULTANT:
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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.08

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Panel: LOS-M4

Location: MECH 1333
Supply From:
Mounting: Surface
Enclosure: Type 1
Available Fault Current:

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 100A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOSM4-1	STORM SHELTER 1330 RECEPTS	N	20 A	1	720	1500					1	20 A	G	EWH-2	LOSM4-2
LOSM4-3	STORM SHELTER 1330 RECEPTS	G	20 A	1			720	180			1	20 A	G	RR 1331 RECEPT	LOSM4-4
LOSM4-5	RR 1332 RECEPT	N	20 A	1					180	216	1	15 A	N	CP-2	LOSM4-6
LOSM4-7	STORM SHELTER 1330 LIGHTING	N	20 A	1	546	5429					2	20 A	N	VAV-1330	LOSM4-8
LOSM4-9	SPARE	N	20 A	1			0	5429			--	--		--	LOSM4-10
LOSM4-11	SPACE		--	1					--	0	1	20 A	N	SPARE	LOSM4-12
LOSM4-13	SPACE		--	1	--	--					1	--		SPACE	LOSM4-14
LOSM4-15	SPACE		--	1			--	--			1	--		SPACE	LOSM4-16
LOSM4-17	SPACE		--	1					--	--	1	--		SPACE	LOSM4-18
LOSM4-19	SPACE		--	1	--	--					1	--		SPACE	LOSM4-20
LOSM4-21	SPACE		--	1			--	--			1	--		SPACE	LOSM4-22
LOSM4-23	SPACE		--	1					--	--	1	--		SPACE	LOSM4-24
LOSM4-25	SPACE		--	1	--	--					1	--		SPACE	LOSM4-26
LOSM4-27	SPACE		--	1			--	--			1	--		SPACE	LOSM4-28
LOSM4-29	SPACE		--	1					--	--	1	--		SPACE	LOSM4-30
LOSM4-31	SPD		--	1	--	--					1	--		SPD	LOSM4-32
LOSM4-33	SPD		--	1			--	--			1	--		SPD	LOSM4-34
LOSM4-35	SPD		--	1					--	--	1	--		SPD	LOSM4-36
LOSM4-37	SPD		--	1	--	--					1	--		SPD	LOSM4-38
LOSM4-39	SPD		--	1			--	--			1	--		SPD	LOSM4-40
LOSM4-41	SPD		--	1					--	--	1	--		SPD	LOSM4-42
				Total Load:	8195 VA		6329 VA		396 VA						
				Total Amps:	76 A		60 A		3 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	11074 VA	100.00%	11074 VA		
Power	360 VA	100.00%	360 VA	**Total Conn. Load:**	14.9 kVA
Receptacles	1080 VA	100.00%	1080 VA	**Total Est. Demand:**	15.4 kVA
Water Heater	1500 VA	125.00%	1875 VA	**Total Conn. Current:**	41 A
Lighting	546 VA	125.00%	683 VA	**Total Est. Demand Current:**	43 A
Receptacle	360 VA	100.00%	360 VA		

Notes:

Panel: LOS-M3

Location: SERVICE 1006
Supply From: LDOS-M1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 12,744A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOSM3-1	LOCKER RECEPTS	N	20 A	1	1440	1440					1	20 A	N	LOCKER RECEPTS	LOSM3-2
LOSM3-3	LOCKER RECEPTS	N	20 A	1			1440	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-4
LOSM3-5	LOCKER RECEPTS	N	20 A	1					1440	1080	1	20 A	N	LOCKER RECEPTS	LOSM3-6
LOSM3-7	LOCKER RECEPTS	N	20 A	1	1440	1080					1	20 A	N	LOCKER RECEPTS	LOSM3-8
LOSM3-9	LOCKER RECEPTS	N	20 A	1			1080	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-10
LOSM3-11	LOCKER RECEPTS	N	20 A	1					1440	1440	1	20 A	N	LOCKER RECEPTS	LOSM3-12
LOSM3-13	EWC	N	20 A	1	360	900					1	20 A	N	LOCKER RECEPTS	LOSM3-14
LOSM3-15	WS-1	N	20 A	1			360	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-16
LOSM3-17	LOCKER RECEPTS	N	20 A	1					1080	1440	1	20 A	N	LOCKER RECEPTS	LOSM3-18
LOSM3-19	LOCKER RECEPTS	N	20 A	1	1080	1620					1	20 A	N	LOCKER RECEPTS	LOSM3-20
LOSM3-21	LOCKER RECEPTS	N	20 A	1			720	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-22
LOSM3-23	LOCKER RECEPTS	N	20 A	1					1080	1080	1	20 A	N	LOCKER RECEPTS	LOSM3-24
LOSM3-25	RECEPTS	N	20 A	1	1440	1080					1	20 A	N	LOCKER RECEPTS	LOSM3-26
LOSM3-27	LOCKER RECEPTS	N	20 A	1			1440	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-28
LOSM3-29	RR/CORR. RECEPTS	N	20 A	1					1080	720	1	20 A	N	LOCKER RECEPTS	LOSM3-30
LOSM3-31	LOCKER RECEPTS	N	20 A	1	1080	720					1	20 A	N	LOCKER RECEPTS	LOSM3-32
LOSM3-33	LOCKER RECEPTS	N	20 A	1			1080	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-34
LOSM3-35	LOCKER RECEPTS	N	20 A	1					1080	1440	1	20 A	N	LOCKER RECEPTS	LOSM3-36
LOSM3-37	CP-1	N	15 A	1	216	1440					1	20 A	N	LOCKER RECEPTS	LOSM3-38
LOSM3-39	LOCKER RECEPTS	N	20 A	1			720	1080			1	20 A	N	LOCKER RECEPTS	LOSM3-40
LOSM3-41	LOCKER RECEPTS	N	20 A	1					720	1080	1	20 A	N	LOCKER RECEPTS	LOSM3-42
LOSM3-43	LOCKER RECEPTS	N	20 A	1	900	1080					1	20 A	N	LOCKER RECEPTS	LOSM3-44
LOSM3-45	LOCKER RECEPTS	N	20 A	1			1440	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-46
LOSM3-47	RECEPTS	N	20 A	1					360	720	1	20 A	N	LOCKER RECEPTS	LOSM3-48
LOSM3-49	SERVICE 1004 RECEPTS	N	20 A	1	360	720					1	20 A	N	LOCKER RECEPTS	LOSM3-50
LOSM3-51	SERVICE 1004 RECEPTS	N	20 A	1			360	1440			1	20 A	N	LOCKER RECEPTS	LOSM3-52
LOSM3-53	SPARE	N	20 A	1					0	720	1	20 A	N	LOCKER RECEPTS	LOSM3-54
LOSM3-55	SPARE	N	20 A	1	0	1440					1	20 A	N	LOCKER RECEPTS	LOSM3-56
LOSM3-57	SPARE	N	20 A	1			0	180			1	20 A	N	MOTORIZED DOOR	LOSM3-58
LOSM3-59	SPARE	N	20 A	1					0	180	1	20 A	G	GWH-1	LOSM3-60
LOSM3-61	SPARE	N	20 A	1	0	360					1	20 A	N	SERVICE 1004 RECEPTS	LOSM3-62
LOSM3-63	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSM3-64
LOSM3-65	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSM3-66
LOSM3-67	SPARE	N	20 A	1	0	--					1	--		SPACE	LOSM3-68
LOSM3-69	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSM3-70
LOSM3-71	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSM3-72
LOSM3-73	SPD		--	1	--	--					1	--		SPD	LOSM3-74
LOSM3-75	SPD		--	1			--	--			1	--		SPD	LOSM3-76
LOSM3-77	SPD		--	1					--	--	1	--		SPD	LOSM3-78
LOSM3-79	SPD		--	1	--	--					1	--		SPD	LOSM3-80
LOSM3-81	SPD		--	1			--	--			1	--		SPD	LOSM3-82
LOSM3-83	SPD		--	1					--	--	1	--		SPD	LOSM3-84
				Total Load:	20196 VA		21420 VA		18180 VA						
				Total Amps:	171 A		181 A		152 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	216 VA	100.00%	216 VA		
Power	1260 VA	100.00%	1260 VA	**Total Conn. Load:**	59.8 kVA
Receptacles	57240 VA	58.74%	33620 VA	**Total Est. Demand:**	36.0 kVA
Water Heater	180 VA	125.00%	225 VA	**Total Conn. Current:**	166 A
Equipment	360 VA	50.00%	180 VA	**Total Est. Demand Current:**	100 A
Receptacle	540 VA	100.00%	540 VA		

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.09

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Panel: LOS-S1

Location: CIRCULATION 2002
Supply From: LDOS-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current: 9,826A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOSS1-1	REFRIG.	G	20 A	1	500	900					1	20 A	N	POLICE BREAK 2101 RECEPTS	LOSS1-2
LOSS1-3	POLICE BREAK 2101 RECEPTS	N	20 A	1			1080	360			1	20 A	G	EWC	LOSS1-4
LOSS1-5	RRS RECEPTS AND OTHERS	N	20 A	1					1080	1080	1	20 A	N	TRAINING OFFR RECEPTS	LOSS1-6
LOSS1-7	POLICE STOR. RECEPTS	N	20 A	1	720	1080					1	20 A	N	TRAINING 2102 RECEPTS	LOSS1-8
LOSS1-9	TRAINING 2102 RECEPTS	N	20 A	1			540	1260			1	20 A	N	PATROL CAPT. RECEPTS	LOSS1-10
LOSS1-11	DET. CAPT. RECEPTS	N	20 A	1					1260	1080	1	20 A	N	ADMIN CAPT. RECEPTS	LOSS1-12
LOSS1-13	CHIEF OFFICE RECEPTS	N	20 A	1	1260	1080					1	20 A	N	IA RECEPTS	LOSS1-14
LOSS1-15	POLICE CONF. RECEPTS	N	20 A	1			1080	360			1	20 A	N	PD RR RECEPTS	LOSS1-16
LOSS1-17	TRAINING LT RECEPTS	N	20 A	1					1080	720	1	20 A	N	CHIEF SEC. RECEPTS	LOSS1-18
LOSS1-19	SEC. PRINT	N	20 A	1	180	900					1	20 A	N	FINANCE CLERK RECEPTS	LOSS1-20
LOSS1-21	CORR. WORKSTATION RECEPTS	N	20 A	1			360	1260			1	20 A	N	OFFICE 2202 RECEPTS	LOSS1-22
LOSS1-23	OFFICE 2201 RECEPTS	N	20 A	1					1080	180	1	20 A	N	OFFICE 2202 FB	LOSS1-24
LOSS1-25	CONV. RECEPTS	N	20 A	1	720	900					1	20 A	N	OFFICE 2204 RECEPTS	LOSS1-26
LOSS1-27	OFFICE 2206 RECEPTS	N	20 A	1			900	900			1	20 A	N	OFFICE 2207 RECEPTS	LOSS1-28
LOSS1-29	POLICE CONF. FBES	N	20 A	1					360	1000	1	20 A	G	MICRO.	LOSS1-30
LOSS1-31	FURNITURE INFEED	N	20 A	1	0	0					1	20 A	N	FURNITURE INFEED	LOSS1-32
LOSS1-33	FURNITURE INFEED	N	20 A	1			0	1920			1	20 A	N	FURNITURE INFEED	LOSS1-34
LOSS1-35	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSS1-36
LOSS1-37	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOSS1-38
LOSS1-39	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOSS1-40
LOSS1-41	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSS1-42
LOSS1-43	CONV. RECEPTS	N	20 A	1	540	900					1	20 A	N	PRINT ROOM RECEPTS	LOSS1-44
LOSS1-45	PRINT ROOM RECEPTS	N	20 A	1			360	360			1	20 A	N	PLOTTER	LOSS1-46
LOSS1-47	PRINT	N	20 A	1					360	--	1	--		SPACE	LOSS1-48
LOSS1-49	PD RR 2111/2112 SENSORS	N	20 A	1	80	--					1	--		SPACE	LOSS1-50
LOSS1-51	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSS1-52
LOSS1-53	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSS1-54
LOSS1-55	SPARE	N	20 A	1	0	--					1	--		SPACE	LOSS1-56
LOSS1-57	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSS1-58
LOSS1-59	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSS1-60
LOSS1-61	SPD		--	1	--	--					1	--		SPD	LOSS1-62
LOSS1-63	SPD		--	1			--	--			1	--		SPD	LOSS1-64
LOSS1-65	SPD		--	1					--	--	1	--		SPD	LOSS1-66
LOSS1-67	SPD		--	1	--	--					1	--		SPD	LOSS1-68
LOSS1-69	SPD		--	1			--	--			1	--		SPD	LOSS1-70
LOSS1-71	SPD		--	1					--	--	1	--		SPD	LOSS1-72
			Total Load:		13600 VA		14580 VA		16960 VA						
			Total Amps:		113 A		123 A		143 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	6080 VA	100.00%	6080 VA		
Receptacles	36720 VA	63.62%	23360 VA	**Total Conn. Load:**	45.1 kVA
Receptacle	2340 VA	100.00%	2340 VA	**Total Est. Demand:**	31.8 kVA
				Total Conn. Current:	125 A
				Total Est. Demand Current:	88 A

Notes:

Panel: LBOS-S2

Location:
Supply From: LDOS-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current: 14,936A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOSS2-1	CAB LTS	N	20 A	1	0	1000					1	20 A	N	STAFF BREAK 2217 RECEPT	LOSS2-2
LOSS2-3	STAFF BREAK 2217 RECEPT	N	20 A	1			1000	1000			1	20 A	N	STAFF BREAK 2217 RECEPT	LOSS2-4
LOSS2-5	STAFF BREAK 2217 RECEPT	N	20 A	1					1000	1000	1	20 A	N	STAFF BREAK 2217 RECEPT	LOSS2-6
LOSS2-7	REFRIG.	G	20 A	1	180	360					1	20 A	N	STAFF BREAK 2217 RECEPTS	LOSS2-8
LOSS2-9	FILE VAULT RECEPTS	N	20 A	1			720	180			1	20 A	N	ELEV. MR RECEPT	LOSS2-10
LOSS2-11	ENGR. VAULT RECEPTS	N	20 A	1					720	360	1	20 A	N	CONF. 2216 FBS	LOSS2-12
LOSS2-13	CONF. 2216 RECEPTS	N	20 A	1	1260	900					1	20 A	N	OFFICE 2215 RECEPTS	LOSS2-14
LOSS2-15	OFFICE 2214 RECEPTS	N	20 A	1			1080	0			1	20 A	N	FIRE SHUTTER	LOSS2-16
LOSS2-17	BUILDING DEPARTMENT...	N	20 A	1					1080	540	1	20 A	N	BUILDING DEPARTMENT...	LOSS2-18
LOSS2-19	BUILDING DEPARTMENT...	N	20 A	1	1080	720					1	20 A	N	ENGR VAULT 2200 RECEPTS	LOSS2-20
LOSS2-21	BUILDING INSPECTIONS 2222 RECEPTS	N	20 A	1			900	1920			1	20 A	N	FURNITURE INFEED	LOSS2-22
LOSS2-23	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSS2-24
LOSS2-25	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOSS2-26
LOSS2-27	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOSS2-28
LOSS2-29	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSS2-30
LOSS2-31	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOSS2-32
LOSS2-33	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOSS2-34
LOSS2-35	FILE VAULT RECEPTS	N	20 A	1					540	1080	1	20 A	N	OFFICE 2212 RECEPTS	LOSS2-36
LOSS2-37	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOSS2-38
LOSS2-39	FURNITURE INFEED	N	20 A	1			1920	900			1	20 A	N	OFFICE 2211 RECEPTS	LOSS2-40
LOSS2-41	OFFICE 2210 RECEPTS	N	20 A	1					1080	900	1	20 A	N	PED RECEPTS	LOSS2-42
LOSS2-43	PED RECEPTS	N	20 A	1	540	1920					1	20 A	N	FURNITURE INFEED	LOSS2-44
LOSS2-45	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOSS2-46
LOSS2-47	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOSS2-48
LOSS2-49	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOSS2-50
LOSS2-51	FURNITURE INFEED	N	20 A	1			1920	182			1	15 A	N	EF-3	LOSS2-52
LOSS2-53	STAFF BREAK 2217 RECEPTS	N	20 A	1					900	--	1	--		SPACE	LOSS2-54
LOSS2-55	SPARE	N	20 A	1	0	--					1	--		SPACE	LOSS2-56
LOSS2-57	SPARE	N	20 A	1			0	--			1	--		SPACE	LOSS2-58
LOSS2-59	SPARE	N	20 A	1					0	--	1	--		SPACE	LOSS2-60
LOSS2-61	SPD		--	1	--	--					1	--		SPD	LOSS2-62
LOSS2-63	SPD		--	1			--	--			1	--		SPD	LOSS2-64
LOSS2-65	SPD		--	1					--	--	1	--		SPD	LOSS2-66
LOSS2-67	SPD		--	1	--	--					1	--		SPD	LOSS2-68
LOSS2-69	SPD		--	1			--	--			1	--		SPD	LOSS2-70
LOSS2-71	SPD		--	1					--	--	1	--		SPD	LOSS2-72
			Total Load:		23320 VA		23242 VA		20720 VA						
			Total Amps:		198 A		197 A		173 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Motor	182 VA	125.00%	228 VA		
Power	2160 VA	100.00%	2160 VA	**Total Conn. Load:**	67.3 kVA
Receptacles	59040 VA	58.47%	34520 VA	**Total Est. Demand:**	42.8 kVA
Elevator	0 VA	0.00%	0 VA	**Total Conn. Current:**	187 A
Receptacle	5900 VA	100.00%	5900 VA	**Total Est. Demand Current:**	119 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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CONSULTANT:
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MODUS ENGINEERING

STRUCTURAL
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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: ELECTRICAL SCHEDULES

SHEET: E6.10

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Panel: LOS-T2

Location:
Supply From: LDOS-M1
Mounting: Surface
Enclosure: Type 1
Available Fault Current: 13,756A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 22,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOST2-1	BREAK RM. 3603/STOR. 3604 RECEPTS	N	20 A	1	720	180					1	20 A	N	ICE MAKER	LOST2-2
LOST2-3	REFRIG.	G	20 A	1			500	540			1	20 A	N	STAIR/JAN/LOCKED STOR. RECEPTS	LOST2-4
LOST2-5	VEND	G	20 A	1					180	1080	1	20 A	N	BREAK ROOM 3603/CORR. RECEPTS	LOST2-6
LOST2-7	MOLLENHOFF CONF. RECEPTS	N	20 A	1	540	180					1	20 A	N	MOLLENHOFF CONF. 3602 FB	LOST2-8
LOST2-9	MOLLENHOFF CONF. 3602 FB	N	20 A	1			180	360			1	20 A	N	CHAMBERS FBS	LOST2-10
LOST2-11	COUNCIL CHAMBERS RECEPTS	N	20 A	1					1080	1080	1	20 A	N	COUNCIL CHAMBER/GEN...	LOST2-12
LOST2-13	COUNCIL CHAMBERS RECEPTS	N	20 A	1	540	360					1	20 A	N	LARGE CONF. RM FBS	LOST2-14
LOST2-15	LARGE CONF. RM RECEPTS	N	20 A	1			540	1080			1	20 A	N	OFFICE 3404 RECEPTS	LOST2-16
LOST2-17	PRINT	N	20 A	1					360	720	1	20 A	N	OPEN OFFICE 3400 RECEPTS	LOST2-18
LOST2-19	OFFICE 3404 RECEPTS	N	20 A	1	1080	1080					1	20 A	N	OFFIE 3402 RECEPTS	LOST2-20
LOST2-21	OFFICE 3401 RECEPTS	N	20 A	1			1440	1080			1	20 A	N	OPEN OFFICE 3400 RECEPTS	LOST2-22
LOST2-23	CU-2	N	25 A	2					1914	1914	2	25 A	N	CU-1	LOST2-24
LOST2-25	--		--	--	1914	1914					--	--		--	LOST2-26
LOST2-27	OPEN OFFICE 3400 RECEPTS	N	20 A	1			360	1920			1	20 A	N	FURNITURE INFEED	LOST2-28
LOST2-29	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOST2-30
LOST2-31	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOST2-32
LOST2-33	FURNITURE INFEED	N	20 A	1			1920	1920			1	20 A	N	FURNITURE INFEED	LOST2-34
LOST2-35	FURNITURE INFEED	N	20 A	1					1920	1920	1	20 A	N	FURNITURE INFEED	LOST2-36
LOST2-37	ROOF RECEPT	N	20 A	1	180	180					1	20 A	G	VEND	LOST2-38
LOST2-39	VEND.	G	20 A	1			180	500			1	20 A	G	REFRIG.	LOST2-40
LOST2-41	MOLLENHOFF CONF. RECEPTS	N	20 A	1					720	0	1	20 A	N	EX FIRE SHUTTER OPERATOR	LOST2-42
LOST2-43	DOOR POWER	N	20 A	1	360	--					1	--		SPACE	LOST2-44
LOST2-45	DOOR POWER		20 A	1			720	--			1	--		SPACE	LOST2-46
LOST2-47	SPARE		20 A	1					0	--	1	--		SPACE	LOST2-48
LOST2-49	SPARE		20 A	1	0	--					1	--		SPACE	LOST2-50
LOST2-51	SPARE		20 A	1			0	--			1	--		SPACE	LOST2-52
LOST2-53	SPARE		20 A	1					0	--	1	--		SPACE	LOST2-54
LOST2-55	SPARE		20 A	1	0	--					1	--		SPACE	LOST2-56
LOST2-57	SPARE		20 A	1			0	--			1	--		SPACE	LOST2-58
LOST2-59	SPARE		20 A	1					0	--	1	--		SPACE	LOST2-60
LOST2-61	SPD		--	1	--	--					1	--		SPD	LOST2-62
LOST2-63	SPD		--	1			--	--			1	--		SPD	LOST2-64
LOST2-65	SPD		--	1					--	--	1	--		SPD	LOST2-66
LOST2-67	SPD		--	1	--	--					1	--		SPD	LOST2-68
LOST2-69	SPD		--	1			--	--			1	--		SPD	LOST2-70
LOST2-71	SPD		--	1					--	--	1	--		SPD	LOST2-72
				Total Load:	13067 VA		13240 VA		16727 VA						
				Total Amps:	109 A		111 A		140 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	1620 VA	100.00%	1620 VA		
Cooling	7654 VA	100.00%	7654 VA	**Total Conn. Load:**	43.0 kVA
Receptacles	32680 VA	65.30%	21340 VA	**Total Est. Demand:**	31.7 kVA
Receptacle	1080 VA	100.00%	1080 VA	**Total Conn. Current:**	119 A
				Total Est. Demand Current:	88 A

Notes:

Panel: LOS-T1

Location:
Supply From: LDOS-M1
Mounting: Recessed
Enclosure: Type 1
Available Fault Current: 6,224A

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 225A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LOST1-1	CU-3	N	25 A	2	1914	1914					2	25 A		CU-4	LOST1-2
LOST1-3	--		--	--			1914	1914			--	--		--	LOST1-4
LOST1-5	MAYORS OFFICE 3301 RECEPTS	N	20 A	1					720	1920	1	20 A	N	FURNITURE INFEED	LOST1-6
LOST1-7	FURNITURE INFEED	N	20 A	1	1920	1920					1	20 A	N	FURNITURE INFEED	LOST1-8
LOST1-9	ROOF RECEPT	N	20 A	1			180	1080			1	20 A	N	WAITING 3300 RECEPTS	LOST1-10
LOST1-11	ROOF RECEPT	N	20 A	1					180	720	1	20 A	N	MAYORS OFFICE 3301	LOST1-12
LOST1-13	MAYORS OFFICE 3301 FB	N	20 A	1	180	900					1	20 A	N	MEETING ROOM 3307 RECEPTS	LOST1-14
LOST1-15	MEETING ROOM 3307 RECEPTS	N	20 A	1			540	1000			1	20 A	G	MICRO.	LOST1-16
LOST1-17	MEETING RM 3307 FB	N	20 A	1					180	720	1	20 A	N	RR/WELLNESS RECEPTS	LOST1-18
LOST1-19	OFFICE 3505 RECEPTS	N	20 A	1	900	900					1	20 A	N	CITY MAN.CONF. RECEPTS	LOST1-20
LOST1-21	CITY MAN.CONF. RECEPTS	N	20 A	1			720	900			1	20 A	N	WORKSPACE 3303 RECEPTS	LOST1-22
LOST1-23	WORKSPACE 3303 PRINT	N	20 A	1					360	900	1	20 A	N	WORKSPACE 3303 RECEPTS	LOST1-24
LOST1-25	CONF. 3208 RECEPTS	N	20 A	1	720	360					1	20 A	N	CONF. 3208 RECEPTS	LOST1-26
LOST1-27	CONF. 3208 RECEPTS	N	20 A	1			540	1260			1	20 A	N	H.R OFFICE 3207 RECEPTS	LOST1-28
LOST1-29	OFFICE 3212 RECEPTS	N	20 A	1					1440	180	1	20 A	N	OFFICE 3212 PRINT	LOST1-30
LOST1-31	OFFICE 3211 RECEPTS	N	20 A	1	1080	1260					1	20 A	N	OFFICE 3210 RECEPTS	LOST1-32
LOST1-33	STOR. 3209 RECEPTS	N	20 A	1			360	900			1	20 A	N	RECEPTS	LOST1-34
LOST1-35	CLERK/FINANCE PRINT	N	20 A	1					360	900	1	20 A	N	OFFICE 3206 RECEPTS	LOST1-36
LOST1-37	OFFICE 3205 RECEPTS	N	20 A	1	1080	900					1	20 A	N	OFFICE 3204 RECEPTS	LOST1-38
LOST1-39	OFFICE 3203 RECEPTS	N	20 A	1			1080	1080			1	20 A	N	OFFICE 3202 RECEPTS	LOST1-40
LOST1-41	OFFICE 3201 RECEPTS	N	20 A	1					900	1080	1	20 A	N	OFFICE 3104 RECEPTS	LOST1-42
LOST1-43	CABLE STUD./WORK RECEPTS	N	20 A	1	1080	540					1	20 A	N	CABLE STUDIO RECEPTS	LOST1-44
LOST1-45	IT. CORRIDOR RECEPTS	N	20 A	1			900	720			1	20 A	N	CONTROL RM RECEPTS	LOST1-46
LOST1-47	CONTROL RM RECEPTS	N	20 A	1					1260	540	1	20 A	N	RR/CONV. RECEPTS	LOST1-48
LOST1-49	EWC	G	20 A	1	360	540					1	20 A	N	IT. CORRIDOR RECEPTS	LOST1-50
LOST1-51	CABLE ACCESS OFFICE 3109...	N	20 A	1			900	900			1	20 A	N	CABLE ACCESS OFFICE 3108...	LOST1-52
LOST1-53	IT OFFICE 3107 RECEPTS	N	20 A	1					900	900	1	20 A	N	IT OFFICE 3106 RECEPTS	LOST1-54
LOST1-55	STOR. 3105 RECEPTS	N	20 A	1	720	180					1	20 A	N	ROOF RECEPT	LOST1-56
LOST1-57	ROOF RECEPT	N	20 A	1			180	80			1	20 A	N	RR 3309/3310 SENSORS	LOST1-58
LOST1-59	SPARE	N	20 A	1					0	--	1	--		SPACE	LOST1-60
LOST1-61	SPARE	N	20 A	1	0	--					1	--		SPACE	LOST1-62
LOST1-63	SPARE	N	20 A	1			0	--			1	--		SPACE	LOST1-64
LOST1-65	SPARE	N	20 A	1					0	--	1	--		SPACE	LOST1-66
LOST1-67	SPARE	N	20 A	1	0	--					1	--		SPACE	LOST1-68
LOST1-69	SPARE	N	20 A	1			0	--			1	--		SPACE	LOST1-70
LOST1-71	SPARE	N	20 A	1					0	--	1	--		SPACE	LOST1-72
LOST1-73	SPD		--	1	--	--					1	--		SPD	LOST1-74
LOST1-75	SPD		--	1			--	--			1	--		SPD	LOST1-76
LOST1-77	SPD		--	1					--	--	1	--		SPD	LOST1-78
LOST1-79	SPD		--	1	--	--					1	--		SPD	LOST1-80
LOST1-81	SPD		--	1			--	--			1	--		SPD	LOST1-82
LOST1-83	SPD		--	1					--	--	1	--		SPD	LOST1-84
				Total Load:	19367 VA		17147 VA		14160 VA						
				Total Amps:	165 A		147 A		118 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	620 VA	100.00%	620 VA		
Cooling	7654 VA	100.00%	7654 VA	**Total Conn. Load:**	50.7 kVA
Receptacles	41680 VA	62.00%	25840 VA	**Total Est. Demand:**	34.8 kVA
Receptacle	720 VA	100.00%	720 VA	**Total Conn. Current:**	141 A
				Total Est. Demand Current:	97 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.11

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BRANCH LU-M1

Location: POLICE DEPT. IT 1312
Supply From: LU-S1
Mounting: Surface
Enclosure: Type 1
Available Isc:

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 100A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LUM1-1	RECEPT	N	20 A	1	360	360					1	20 A	N	RECEPT	LUM1-2
LUM1-3	RECEPT	N	20 A	1			360	360			1	20 A	N	RECEPT	LUM1-4
LUM1-5	RECEPT	N	20 A	1					360	360	1	20 A	N	IT RACK	LUM1-6
LUM1-7	IT RACK	N	20 A	1	360	180					1	30 A	N	IT RACK	LUM1-8
LUM1-9	IT RACK	N	30 A	1			180	0			1	15 A	N	CLEAN AGENT	LUM1-10
LUM1-11	SPARE	N	20 A	1					0	--	1	--		SPACE	LUM1-12
LUM1-13	SPARE	N	20 A	1	0	--					1	--		SPACE	LUM1-14
LUM1-15	SPARE	N	20 A	1			0	--			1	--		SPACE	LUM1-16
LUM1-17	SPARE	N	20 A	1					0	--	1	--		SPACE	LUM1-18
LUM1-19	SPD		--	1	--	--					1	--		SPD	LUM1-20
LUM1-21	SPD		--	1			--	--			1	--		SPD	LUM1-22
LUM1-23	SPD		--	1					--	--	1	--		SPD	LUM1-24
LUM1-25	SPD		--	1	--	--					1	--		SPD	LUM1-26
LUM1-27	SPD		--	1			--	--			1	--		SPD	LUM1-28
LUM1-29	SPD		--	1					--	--	1	--		SPD	LUM1-30
				Total Load:	1260 VA		900 VA		720 VA						
				Total Amps:	11 A		8 A		6 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	2880 VA	100.00%	2880 VA		
				Total Conn. Load:	2.9 kVA
				Total Est. Demand:	2.9 kVA
				Total Conn. Current:	8 A
				Total Est. Demand Current:	8 A

Notes:

BRANCH LU-T1

Location:
Supply From: LU-S1
Mounting: Surface
Enclosure: Type 1
Available Isc:

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 100A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LUT1-1	CLEAN AGENT	N	15 A	1	0	360					1	20 A	N	ELECTRICAL/IT 3101 RECEPT	LUT1-2
LUT1-3	IT RACK	N	20 A	1			360	360			1	20 A	N	IT RACK	LUT1-4
LUT1-5	IT RACK	N	30 A	1					180	180	1	30 A	N	IT RACK	LUT1-6
LUT1-7	ELECTRICAL/IT 3101 RECEPT	N	20 A	1	360	360					1	20 A	N	ELECTRICAL/IT 3101 RECEPT	LUT1-8
LUT1-9	ELECTRICAL/IT 3101 RECEPT	N	20 A	1			360	--			1	--		SPACE	LUT1-10
LUT1-11	SPARE	N	20 A	1					0	--	1	--		SPACE	LUT1-12
LUT1-13	SPARE	N	20 A	1	0	--					1	--		SPACE	LUT1-14
LUT1-15	SPARE	N	20 A	1			0	--			1	--		SPACE	LUT1-16
LUT1-17	SPARE	N	20 A	1					0	--	1	--		SPACE	LUT1-18
LUT1-19	SPD		--	1	--	--					1	--		SPD	LUT1-20
LUT1-21	SPD		--	1			--	--			1	--		SPD	LUT1-22
LUT1-23	SPD		--	1					--	--	1	--		SPD	LUT1-24
LUT1-25	SPD		--	1	--	--					1	--		SPD	LUT1-26
LUT1-27	SPD		--	1			--	--			1	--		SPD	LUT1-28
LUT1-29	SPD		--	1					--	--	1	--		SPD	LUT1-30
				Total Load:	1080 VA		1080 VA		360 VA						
				Total Amps:	10 A		10 A		3 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	1080 VA	100.00%	1080 VA		
Receptacles	1440 VA	100.00%	1440 VA	**Total Conn. Load:**	2.5 kVA
				Total Est. Demand:	2.5 kVA
				Total Conn. Current:	7 A
				Total Est. Demand Current:	7 A

Notes:

Panel: LU-S1

Location: ELECTRICAL/IT STORAGE 2008
Supply From: 20 KVA UPS
Mounting: Surface
Enclosure: Type 1
Available Fault Current:

Volts: 120/208 Wye
Phases: 3
Wires: 4

S.C.C.R. Rating: 10,000A
Mains Type: MLO
Mains Rating: 100A
MCB Rating: -
SPD: INTERNAL

Notes:

CKT	Circuit Description	Type	Trip	Poles	A		B		C		Poles	Trip	Type	Circuit Description	CKT
LUS1-1	CLEAN AGENT	N	15 A	1	0	360					1	20 A	N	IT RACK	LUS1-2
LUS1-3	IT RACK	N	30 A	1			180	360			1	20 A	N	IT RACK	LUS1-4
LUS1-5	IT RACK	N	30 A	1					180	360	1	20 A	N	IT RACK	LUS1-6
LUS1-7	ELEC/IT. STOR 2008 RECEPTS	N	20 A	1	360	360					1	20 A	N	ELEC/IT. STOR 2008 RECEPTS	LUS1-8
LUS1-9	ELEC/IT. STOR 2008 RECEPTS	N	20 A	1			360	360			1	20 A	N	IT RACK	LUS1-10
LUS1-11	IT RACK	N	30 A	1					180	360	1	20 A	N	IT RACK	LUS1-12
LUS1-13	IT RACK	N	20 A	1	360	180					1	30 A	N	IT RACK	LUS1-14
LUS1-15	IT RACK	N	30 A	1			180	400			1	20 A	N	DOOR ACCESS	LUS1-16
LUS1-17	ELEC/IT. STOR 2008 RECEPTS	N	20 A	1					360	360	1	20 A	N	ELEC/IT. STOR 2008 RECEPTS	LUS1-18
LUS1-19	ELEC/IT. STOR 2008 RECEPTS	N	20 A	1	360	360					1	20 A	N	ELEC/IT. STOR 2008 RECEPTS	LUS1-20
LUS1-21	ELEC/IT. STOR 2008 RECEPTS	N	20 A	1			360	1260			3	60 A	N	LU-M1	LUS1-22
LUS1-23	COUNCIL CHAMBERS RECEPTS	N	20 A	1					720	900	--	--		--	LUS1-24
LUS1-25	LU-T1	N	60 A	3	1080	720					--	--		--	LUS1-26
LUS1-27	--		--	--			1080	--			1	--		SPACE	LUS1-28
LUS1-29	--		--	--					360	--	1	--		SPACE	LUS1-30
LUS1-31	SPD		--	1	--	--					1	--		SPD	LUS1-32
LUS1-33	SPD		--	1			--	--			1	--		SPD	LUS1-34
LUS1-35	SPD		--	1					--	--	1	--		SPD	LUS1-36
LUS1-37	SPD		--	1	--	--					1	--		SPD	LUS1-38
LUS1-39	SPD		--	1			--	--			1	--		SPD	LUS1-40
LUS1-41	SPD		--	1					--	--	1	--		SPD	LUS1-42
				Total Load:	4140 VA		4540 VA		3780 VA						
				Total Amps:	35 A		38 A		32 A						

Type Legend:
N=NORMAL G=GFI M=MOTORIZED E=EXISTING ST=SHUNT TRIP A=ARC FAULT H=HANDLE LOCK

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	11020 VA	100.00%	11020 VA		
Receptacles	1440 VA	100.00%	1440 VA	**Total Conn. Load:**	12.5 kVA
				Total Est. Demand:	12.5 kVA
				Total Conn. Current:	35 A
				Total Est. Demand Current:	35 A

Notes:

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

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DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ELECTRICAL SCHEDULES

SHEET:
E6.12

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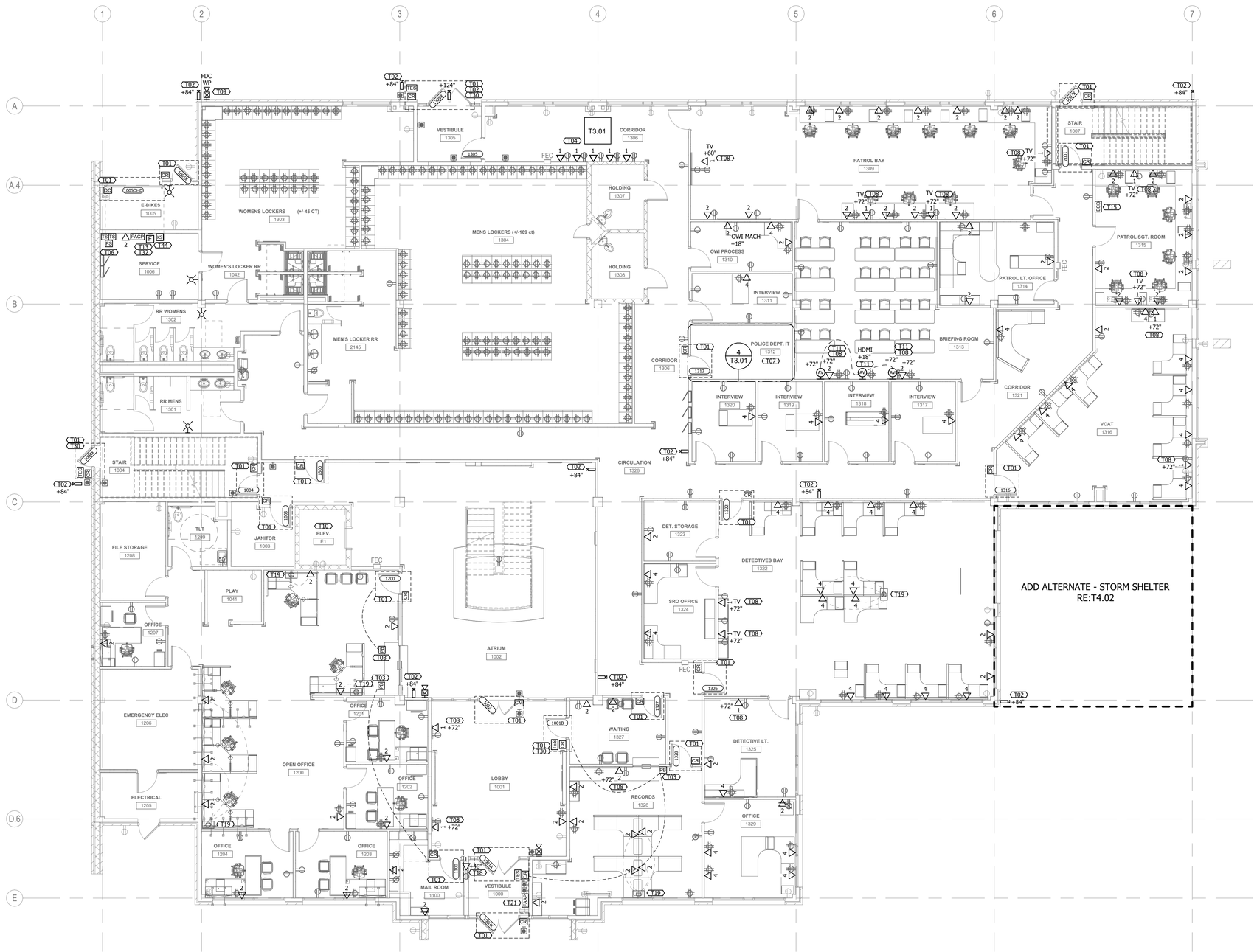

1 LOW VOLTAGE FIRST FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. **REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.**

B. SURFACE RACEWAY IS NOT TO BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT.

C. WHERE HORIZONTAL LOW VOLTAGE CABLING NEEDS TO PENETRATE A WALL, CONTRACTOR SHALL INSTALL A MINIMUM OF (2) 2" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. (1) CONDUIT SHALL SERVE CATEGORY CABLING. DO NOT EXCEED 40% PIPE FILL.

D. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

E. COORDINATE ELECTRICAL REQUIREMENTS WITH DOOR CONTRACTOR PRIOR TO INSTALLATION.

F. COORDINATE ALL DEVICES WITH ARCHITECTURAL PLANS, CASEWORK SUBMITTALS, & OWNER PROVIDED EQUIPMENT.

G. ALL DEVICES CALLED OUT TO BE INSTALLED AT NON-STANDARD HEIGHTS SHALL BE VERIFIED WITH DESIGN TEAM PRIOR TO ROUGH-IN.

H. ALL NEW WORK INDICATED IN EXISTING WALLS SHALL BE INSTALLED WITH CONCEALED WIRING AND FLUSH-MOUNTED DEVICES. CUTTING AND PATCHING SHALL BE BY GENERAL CONTRACTOR.

I. FIRE ALARM INITIATING DEVICES SHALL NOT BE INSTALLED WITHIN 36 INCHES HORIZONTALLY FROM FORCED AIR HVAC DIFFUSERS OR THE END OF CEILING FAN BLADES.

REFERENCED NOTES

T01 ACCESS CONTROLLED DOOR. REFER TO LOW VOLTAGE DETAILS AND ARCHITECTURAL SPECIFICATION SECTION 08-7100 FOR OPERATION AND FURTHER ROUGH-IN/BIDDING INFORMATION. COORDINATE ALL DOORHOLDS, CARD READERS, ADA PUSHBUTTONS, AND OTHER ACCESSORIES WITH DESIGN TEAM PRIOR TO ROUGH-IN.

T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T03 PROVIDE MOMENTARY PUSH BUTTON AT DEDICATED ACCESS-CONTROLLED DOOR. ACTIVATION SHALL RELEASE DOOR VIA ACCESS CONTROL SYSTEM. PUSH BUTTON SHALL BE HARD-WIRED TO ACCESS CONTROL PANEL. ALL WIRING, PROGRAMMING, INTEGRATION, AND TESTING BY ACCESS CONTROL CONTRACTOR. COORDINATE LOCATION AND OPERATION WITH OWNER.

T04 BODY CAMERA CHARGING STATION. PROVIDE DATA AND ELECTRICAL CONNECTIONS AS REQUIRED. ELECTRICAL CONTRACTOR SHALL COORDINATE POWER AND DATA REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN. CABLED TO BODY CAM HEAD END LOCATED IN POLICE DEPT. IT 1312.

T06 FLOW AND TAMPER SWITCHES SHALL BE PROVIDED BY FIRE ALARM CONTRACTOR. PROVIDE SUPERVISING CONNECTIONS TO FIRE SPRINKLER FOR THE SPRINKLER SYSTEM. COORDINATE FINAL DEVICE LOCATIONS AND QUANTITY WITH THE SPRINKLER CONTRACTOR.

T07 TELECOM ROOM. REFER TO ENLARGED PLANS FOR LAYOUT OF NETWORK EQUIPMENT, SECURITY EQUIPMENT, FIRE ALARM, AND ADDITIONAL LOW VOLTAGE SYSTEMS.

T08 DISPLAYS AND MOUNTS SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN ONLY. LOCATION SHALL BE COORDINATED WITH OWNER PRIOR TO ROUGH-IN.

T09 WEATHERPROOF HORN-STROBE. COORDINATE LOCATION WITH AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLATION. COORDINATE INSTALLATION WITH SPRINKLER CONTRACTOR AND FIRE DEPARTMENT CONNECTION. ALARM ON WATER FLOW.

T10 FIRE ALARM CONTRACTOR SHALL PROVIDE CODE-COMPLIANT DETECTION, MONITORING, AND CONTROL FOR EXISTING ELEVATOR HOISTWAY AND EQUIPMENT. REUSE EXISTING ELEVATOR CAB CALL STATION AND ASSOCIATED CABLING; ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SYSTEM IS FUNCTIONAL AND PROVIDE MODIFICATIONS AS REQUIRED. COORDINATE REQUIRED TELEPHONE/NETWORK CONNECTIONS, PATHWAYS, AND INTERFACES WITH FIRE ALARM AND STRUCTURED CABLING CONTRACTOR.

T11 ONE (1) 1.5" PATHWAY SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR TO EACH DISPLAY LOCATION. PATHWAYS FROM EACH DISPLAY SHALL BE RUN TO A DUAL HDMI WALL PORT. AV CONTRACTOR SHALL PROVIDE ALL HDMI CONNECTIONS AND JUNCTION BOXES WITH HDMI FACEPLATE TERMINATIONS.

T13 ELECTRICAL CONTRACTOR SHALL COORDINATE ALL POWER AND DATA REQUIREMENTS WITH THE FIRE ALARM CONTRACTOR.

T15 FIRE ALARM CONTRACTOR SHALL PROVIDE EMERGENCY CALL BOX COMMAND PANEL. COMMUNICATOR/COMMAND PANEL BASE STATION SHALL BE LOCATED IN PATROL SGT. ROOM.

T18 PROTECTED PUBLIC INFORMATION DISPLAY SHALL BE OWNER FURNISHED AND CONTRACTOR INSTALLED. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH IN AND STRUCTURED CABLING CONTRACTOR SHALL FURNISH AND INSTALL ONE (1) CAT 6 NETWORK DROP FOR DISPLAY. NETWORK DROP SHALL RUN TO THE ELECTRICAL/IT STORAGE 2008. COORDINATE WITH ARCHITECTURAL SPECIFIC DETAIL FOR ROUGH IN AND FURTHER DETAILS. COORDINATE WITH OWNER AND DESIGN TEAM PRIOR TO ROUGH IN.

T19 FURNITURE FEED LOCATION SHOWN FOR REFERENCE ONLY. PROVIDE FACEPLATE WITH TERMINATIONS AT EACH WORKSTATION. ELECTRICAL CONTRACTOR AND STRUCTURED CABLING CONTRACTOR SHALL COORDINATE FINAL LOCATIONS, POWER AND DATA REQUIREMENTS, AND CONNECTION TYPES WITH THE CITY'S FURNITURE VENDOR DURING CONSTRUCTION AND PRIOR TO ROUGH-IN.

T21 FIRE ALARM ANNUNCIATOR PANEL. CABINET SHALL BE RECESSED INTO WALL. COORDINATE ROUGH IN REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

T30 TELEPHONE ENTRY SYSTEM (TES) SHALL BE OWNER FURNISHED, OWNER INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6 CABLE. TES SHALL BE INTEGRATED WITH THE VIDEO SURVEILLANCE AND ACCESS CONTROL SYSTEMS. COORDINATE DOOR RELEASE INTERFACE AND OPERATION WITH THE ACCESS CONTROL CONTRACTOR AND OWNER'S CAMERA CONTRACTOR.

T32 FIRE ALARM CONTROL PANEL. COORDINATE ROUGH IN REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

T44 KEYED SMOKE CONTROLLED SWITCH. ELECTRICAL CONTRACTOR SHALL PROVIDE KEYED SWITCH FOR SMOKE CONTROL SYSTEM. COORDINATE FINAL SEQUENCE OF OPERATIONS WITH THE MECHANICAL AND ELECTRICAL CONTRACTORS. SWITCH SHALL NOT BE TIED TO THE FIRE ALARM CONTROL PANEL.

NOTE:
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WATERLOO, IA

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24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR LOW VOLTAGE FLOOR PLAN

SHEET:
T1.01

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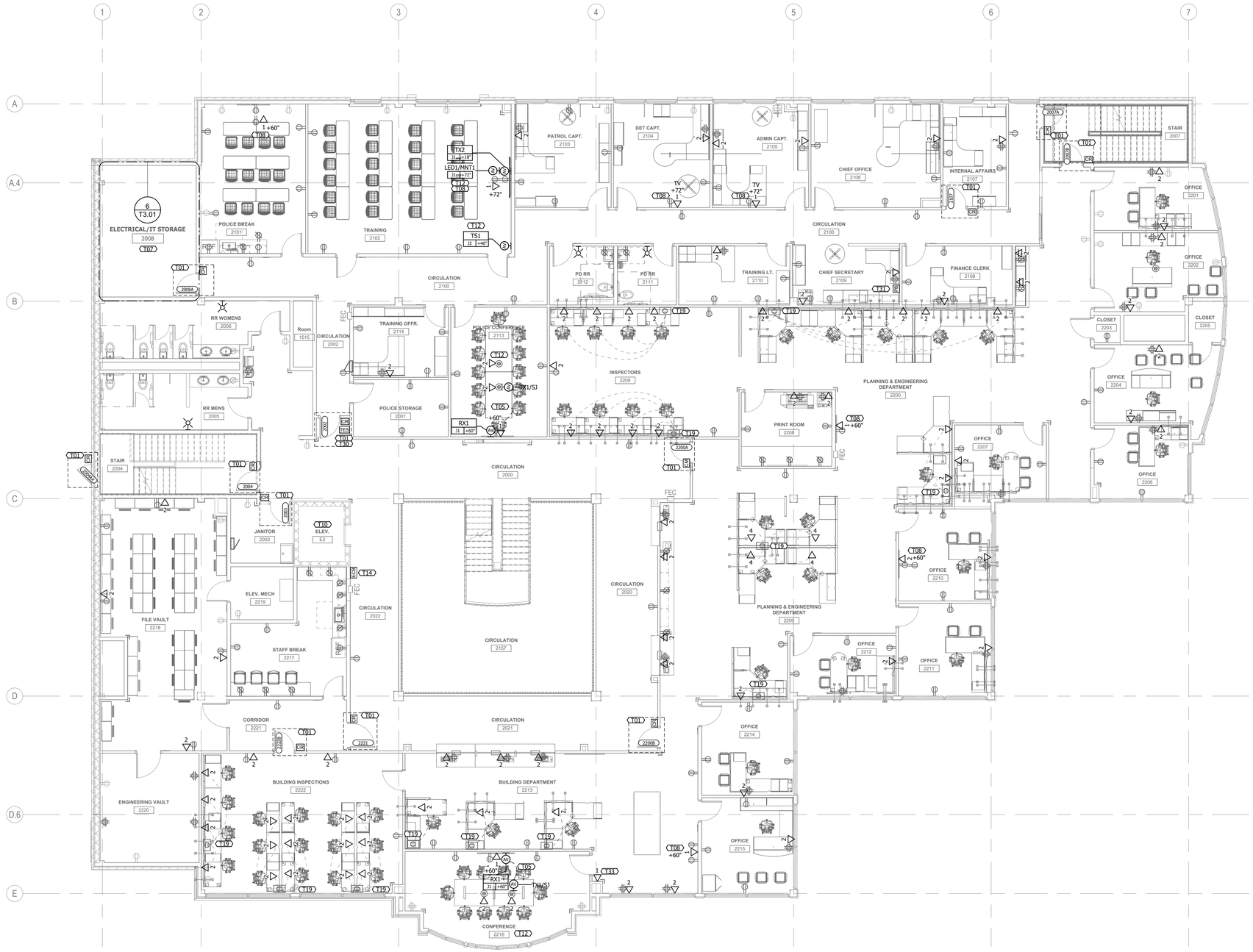

1 LOW VOLTAGE SECOND FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. **REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.**

B. SURFACE RACEWAY IS NOT TO BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT.

C. WHERE HORIZONTAL LOW VOLTAGE CABLING NEEDS TO PENETRATE A WALL, CONTRACTOR SHALL INSTALL A MINIMUM OF (2) 2" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. (1) CONDUIT SHALL SERVE CATEGORY CABLING. DO NOT EXCEED 40% PIPE FILL.

D. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

E. COORDINATE ELECTRICAL REQUIREMENTS WITH DOOR CONTRACTOR PRIOR TO INSTALLATION.

F. COORDINATE ALL DEVICES WITH ARCHITECTURAL PLANS, CASEWORK SUBMITTALS, & OWNER PROVIDED EQUIPMENT.

G. ALL DEVICES CALLED OUT TO BE INSTALLED AT NON-STANDARD HEIGHTS SHALL BE VERIFIED WITH DESIGN TEAM PRIOR TO ROUGH-IN.

H. ALL NEW WORK INDICATED IN EXISTING WALLS SHALL BE INSTALLED WITH CONCEALED WIRING AND FLUSH-MOUNTED DEVICES. CUTTING AND PATCHING SHALL BE BY GENERAL CONTRACTOR.

I. FIRE ALARM INITIATING DEVICES SHALL NOT BE INSTALLED WITHIN 36 INCHES HORIZONTALLY FROM FORCED AIR HVAC DIFFUSERS OR THE END OF CEILING FAN BLADES.

REFERENCED NOTES

T01 ACCESS CONTROLLED DOOR. REFER TO LOW VOLTAGE DETAILS AND ARCHITECTURAL SPECIFICATION SECTION 08-7100 FOR OPERATION AND FURTHER ROUGH-IN/BIDDING INFORMATION. COORDINATE ALL DOORHOLDS, CARD READERS, ADA PUSHBUTTONS, AND OTHER ACCESSORIES WITH DESIGN TEAM PRIOR TO ROUGH-IN.

T05 ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 1-1/2" CONDUIT PATHWAY BETWEEN THE FLOOR JUNCTION BOX AND WALL-MOUNTED JUNCTION BOX. AV CONTRACTOR SHALL PROVIDE ONE COMPLETE HDMI CONNECTION, INCLUDING CABLING, FURNITURE ROUTING, CONNECTORS, TERMINATIONS, AND ALL ACCESSORIES REQUIRED FOR A COMPLETE AND OPERATIONAL INSTALLATION.

T07 TELECOM ROOM. REFER TO ENLARGED PLANS FOR LAYOUT OF NETWORK EQUIPMENT, SECURITY EQUIPMENT, FIRE ALARM, AND ADDITIONAL LOW VOLTAGE SYSTEMS.

T08 DISPLAYS AND MOUNTS SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN ONLY. LOCATION SHALL BE COORDINATED WITH OWNER PRIOR TO ROUGH-IN.

T10 FIRE ALARM CONTRACTOR SHALL PROVIDE CODE-COMPLIANT DETECTION, MONITORING, AND CONTROL FOR EXISTING ELEVATOR HOISTWAY AND EQUIPMENT. REUSE EXISTING ELEVATOR CAB CALL STATION AND ASSOCIATED CABLING; ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SYSTEM IS FUNCTIONAL AND PROVIDE MODIFICATIONS AS REQUIRED. COORDINATE REQUIRED TELEPHONE/NETWORK CONNECTIONS, PATHWAYS, AND INTERFACES WITH FIRE ALARM AND STRUCTURED CABLING CONTRACTOR.

T12 A/V CONTRACTOR SHALL FURNISH AND INSTALL A/V SYSTEM. REFER TO BILL OF MATERIALS, LINE DRAWINGS, MOUNTING ELEVATIONS, AND RACK DIAGRAMS FOR FURTHER INFORMATION.

T14 FIRE ALARM CONTRACTOR SHALL PROVIDE EMERGENCY CALL BOX (ECB). MOUNT AT 46" AFF ADJACENT TO ELEVATOR DOOR/CONTROLLER. STRUCTURED CABLE CONTRACTOR SHALL PROVIDE (1) NETWORK CONNECTION FOR PHONE PROGRAMMING. SYSTEM SHALL AUTOMATICALLY DIAL AN ONSITE CENTRAL STATION OR CONNECT TO 911 EMERGENCY SERVICE.

T19 FURNITURE FEED LOCATION SHOWN FOR REFERENCE ONLY. PROVIDE FACEPLATE WITH TERMINATIONS AT EACH WORKSTATION. ELECTRICAL CONTRACTOR AND STRUCTURED CABLING CONTRACTOR SHALL COORDINATE FINAL LOCATIONS, POWER AND DATA REQUIREMENTS, AND CONNECTION TYPES WITH THE CITY'S FURNITURE VENDOR DURING CONSTRUCTION AND PRIOR TO ROUGH-IN.

T30 TELEPHONE ENTRY SYSTEM (TES) SHALL BE OWNER FURNISHED, OWNER INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6 CABLE. TES SHALL BE INTEGRATED WITH THE VIDEO SURVEILLANCE AND ACCESS CONTROL SYSTEMS. COORDINATE DOOR RELEASE INTERFACE AND OPERATION WITH THE ACCESS CONTROL CONTRACTOR AND OWNER'S CAMERA CONTRACTOR.

T31 PROVIDE PUSHBUTTON AND ASSOCIATED CABLING TO THE TES FOR CONNECTION TO THE ACCESS CONTROL SYSTEM SERVING DOOR 2002. COORDINATE REQUIRED INTERFACE, PROGRAMMING, AND FINAL OPERATION WITH THE ACCESS CONTROL AND DOOR HARDWARE SYSTEMS.

T33 ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG BACK BOX WITH LOW-VOLTAGE MUD RING AND 3/4" PATHWAY WITH PULL STRING TO ACCESSIBLE CEILING. STRUCTURED CABLING CONTRACTOR TO PROVIDE (1) TERMINATED CAT 6 DROP TO NEAREST NETWORK CLOSET AND A BLANK WALL PLATE. REFER TO T4.01 NETWORK MAPPING. MOUNT BOX WITH TOP OF DEVICE AT 48" ABOVE FINISHED FLOOR. DEVICE PROVIDED BY AV CONTRACTOR. COORDINATE FINAL LOCATION WITH AV CONTRACTOR AND ARCHITECT.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR LOW VOLTAGE FLOOR PLAN

SHEET:
T1.02

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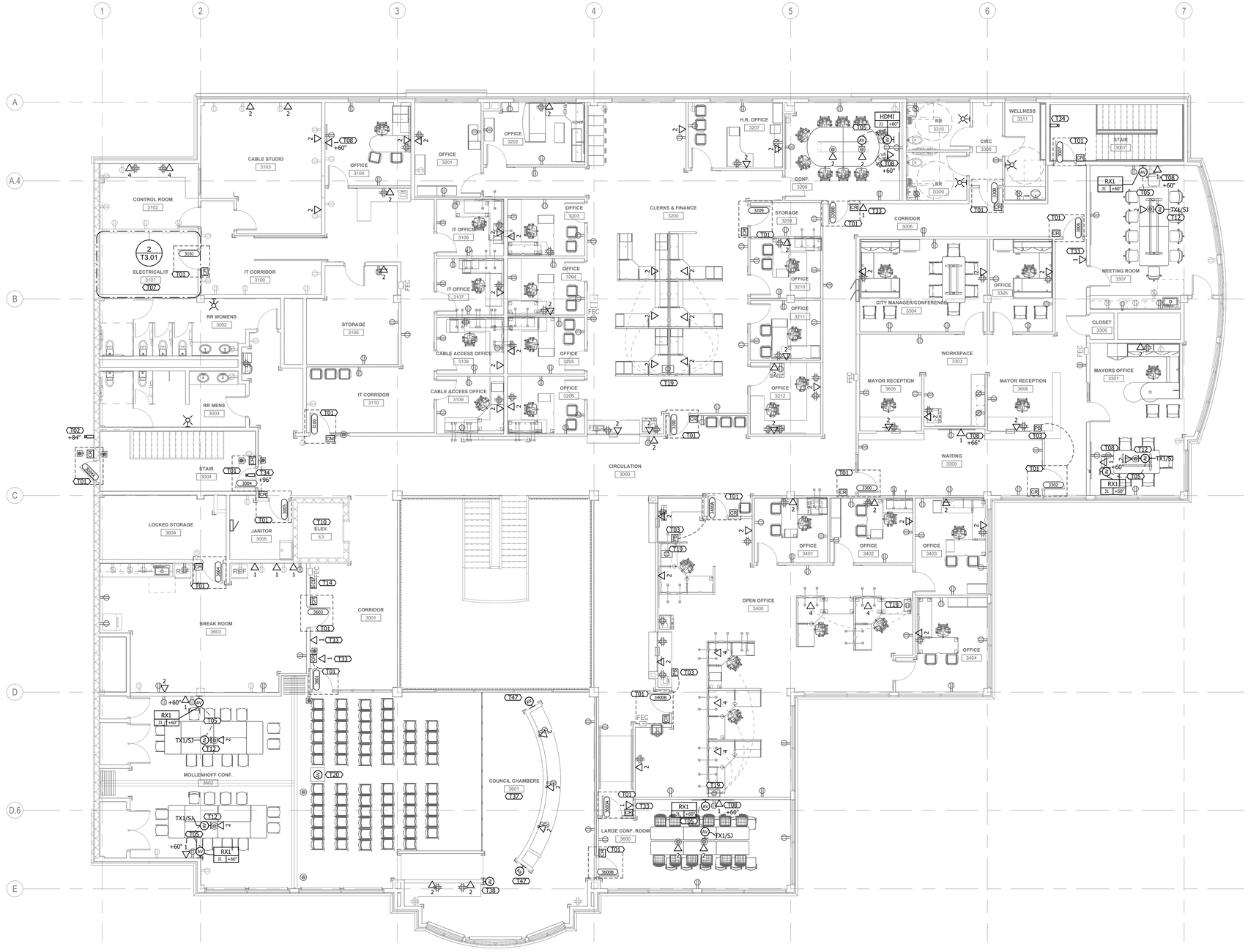

1 LOW VOLTAGE THIRD FLOOR
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. **REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.**

B. SURFACE RACEWAY IS NOT TO BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT.

C. WHERE HORIZONTAL LOW VOLTAGE CABLING NEEDS TO PENETRATE A WALL, CONTRACTOR SHALL INSTALL A MINIMUM OF (2) 2" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. (1) CONDUIT SHALL SERVE CATEGORY CABLING. DO NOT EXCEED 40% PIPE FILL.

D. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

E. COORDINATE ELECTRICAL REQUIREMENTS WITH DOOR CONTRACTOR PRIOR TO INSTALLATION.

F. COORDINATE ALL DEVICES WITH ARCHITECTURAL PLANS, CASEWORK SUBMITTALS, & OWNER PROVIDED EQUIPMENT.

G. ALL DEVICES CALLED OUT TO BE INSTALLED AT NON-STANDARD HEIGHTS SHALL BE VERIFIED WITH DESIGN TEAM PRIOR TO ROUGH-IN.

H. ALL NEW WORK INDICATED IN EXISTING WALLS SHALL BE INSTALLED WITH CONCEALED WIRING AND FLUSH-MOUNTED DEVICES. CUTTING AND PATCHING SHALL BE BY GENERAL CONTRACTOR.

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T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T03 PROVIDE MOMENTARY PUSH BUTTON AT DEDICATED ACCESS-CONTROLLED DOOR. ACTIVATION SHALL RELEASE DOOR VIA ACCESS CONTROL SYSTEM. PUSH BUTTON SHALL BE HARD-WIRED TO ACCESS CONTROL PANEL. ALL WIRING, PROGRAMMING, INTEGRATION, AND TESTING BY ACCESS CONTROL CONTRACTOR. COORDINATE LOCATION AND OPERATION WITH OWNER.

T05 ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 1-1/2" CONDUIT PATHWAY BETWEEN THE FLOOR JUNCTION BOX AND WALL-MOUNTED JUNCTION BOX. AV CONTRACTOR SHALL PROVIDE ONE COMPLETE HDMI CONNECTION, INCLUDING CABLING, FURNITURE ROUTING, CONNECTORS, TERMINATIONS, AND ALL ACCESSORIES REQUIRED FOR A COMPLETE AND OPERATIONAL INSTALLATION.

T07 TELECOM ROOM. REFER TO ENLARGED PLANS FOR LAYOUT OF NETWORK EQUIPMENT, SECURITY EQUIPMENT, FIRE ALARM, AND ADDITIONAL LOW VOLTAGE SYSTEMS.

T08 DISPLAYS AND MOUNTS SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN ONLY. LOCATION SHALL BE COORDINATED WITH OWNER PRIOR TO ROUGH-IN.

T10 FIRE ALARM CONTRACTOR SHALL PROVIDE CODE-COMPLIANT DETECTION, MONITORING, AND CONTROL FOR EXISTING ELEVATOR HOISTWAY AND EQUIPMENT. REUSE EXISTING ELEVATOR CAB CALL STATION AND ASSOCIATED CABLING; ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SYSTEM IS FUNCTIONAL AND PROVIDE MODIFICATIONS AS REQUIRED. COORDINATE REQUIRED TELEPHONE/NETWORK CONNECTIONS, PATHWAYS, AND INTERFACES WITH FIRE ALARM AND STRUCTURED CABLING CONTRACTOR.

T12 A/V CONTRACTOR SHALL FURNISH AND INSTALL A/V SYSTEM. REFER TO BILL OF MATERIALS, LINE DRAWINGS, MOUNTING ELEVATIONS, AND RACK DIAGRAMS FOR FURTHER INFORMATION.

T14 FIRE ALARM CONTRACTOR SHALL PROVIDE EMERGENCY CALL BOX (ECB). MOUNT AT 46" AFF ADJACENT TO ELEVATOR DOOR/CONTROLLER. STRUCTURED CABLE CONTRACTOR SHALL PROVIDE (1) NETWORK CONNECTION FOR PHONE PROGRAMMING. SYSTEM SHALL AUTOMATICALLY DIAL AN ONSITE CENTRAL STATION OR CONNECT TO 911 EMERGENCY SERVICE.

T19 FURNITURE FEED LOCATION SHOWN FOR REFERENCE ONLY. PROVIDE FACEPLATE WITH TERMINATIONS AT EACH WORKSTATION. ELECTRICAL CONTRACTOR AND STRUCTURED CABLING CONTRACTOR SHALL COORDINATE FINAL LOCATIONS, POWER AND DATA REQUIREMENTS, AND CONNECTION TYPES WITH THE CITY'S FURNITURE VENDOR DURING CONSTRUCTION AND PRIOR TO ROUGH-IN.

T20 PODIUM ROUGH-IN. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 3/4" CONDUIT PATHWAY FROM PODIUM TO ABOVE CEILING LOCATION NOTED ON T2.03. AV CONTRACTOR SHALL PROVIDE ALL PARTS AND PIECES FOR A COMPLETE AND WORKING SYSTEM. COORDINATE FINAL LOCATION AND MOUNTING HEIGHT PRIOR TO ROUGH-IN.

T33 ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG BACK BOX WITH LOW-VOLTAGE MUD RING AND 3/4" PATHWAY WITH PULL STRING TO ACCESSIBLE CEILING. STRUCTURED CABLING CONTRACTOR TO PROVIDE (1) TERMINATED CAT 6 DROP TO NEAREST NETWORK CLOSET AND A BLANK WALL PLATE. REFER TO T4.01 NETWORK MAPPING. MOUNT BOX WITH TOP OF DEVICE AT 48" ABOVE FINISHED FLOOR. DEVICE PROVIDED BY AV CONTRACTOR. COORDINATE FINAL LOCATION WITH AV CONTRACTOR AND ARCHITECT.

T34 FUTURE VIDEO SURVEILLANCE CAMERA LOCATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6 CABLE TERMINATED ON A BISCUIT JACK ABOVE CEILING TO A POE NETWORK SWITCH IN SECOND FLOOR MDF. ALLOW FOR A 20FT SERVICE LOOP AT ACCESSIBLE CEILINGS. EXPOSED LOCATIONS SHALL BE CONCEALED AND SERVICE LOOP SHALL BE AT THE CLOSET LOCATIONS.

T37 AUDIO VIDEO EQUIPMENT SERVING COUNCIL CHAMBERS SHALL BE RELOCATED AND INSTALLED BY OWNER'S AV INSTALLER. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL PATHWAYS WITH OWNER'S AV INSTALLER PRIOR TO INSTALLATION.

T38 STAFF MONITOR ROUGH-IN. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 1" CONDUIT PATHWAY FROM STAFF MONITOR LOCATION CASEWORK TO ABOVE CEILING LOCATION NOTED ON T2.03. AV CONTRACTOR SHALL PROVIDE ALL PARTS AND PIECES FOR A COMPLETE AND WORKING SYSTEM. COORDINATE FINAL LOCATION AND MOUNTING HEIGHT PRIOR TO ROUGH-IN.

T47 COUNCIL TABLE ROUGH-IN. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 1-1/4" CONDUIT PATHWAY FROM COUNCIL TABLE TO ABOVE CEILING LOCATION NOTED ON T2.03. AV CONTRACTOR SHALL PROVIDE ALL PARTS AND PIECES FOR A COMPLETE AND WORKING SYSTEM. COORDINATE FINAL LOCATION AND MOUNTING HEIGHT PRIOR TO ROUGH-IN.

NOTE:
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SHEET NAME:
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SHEET:
T1.03

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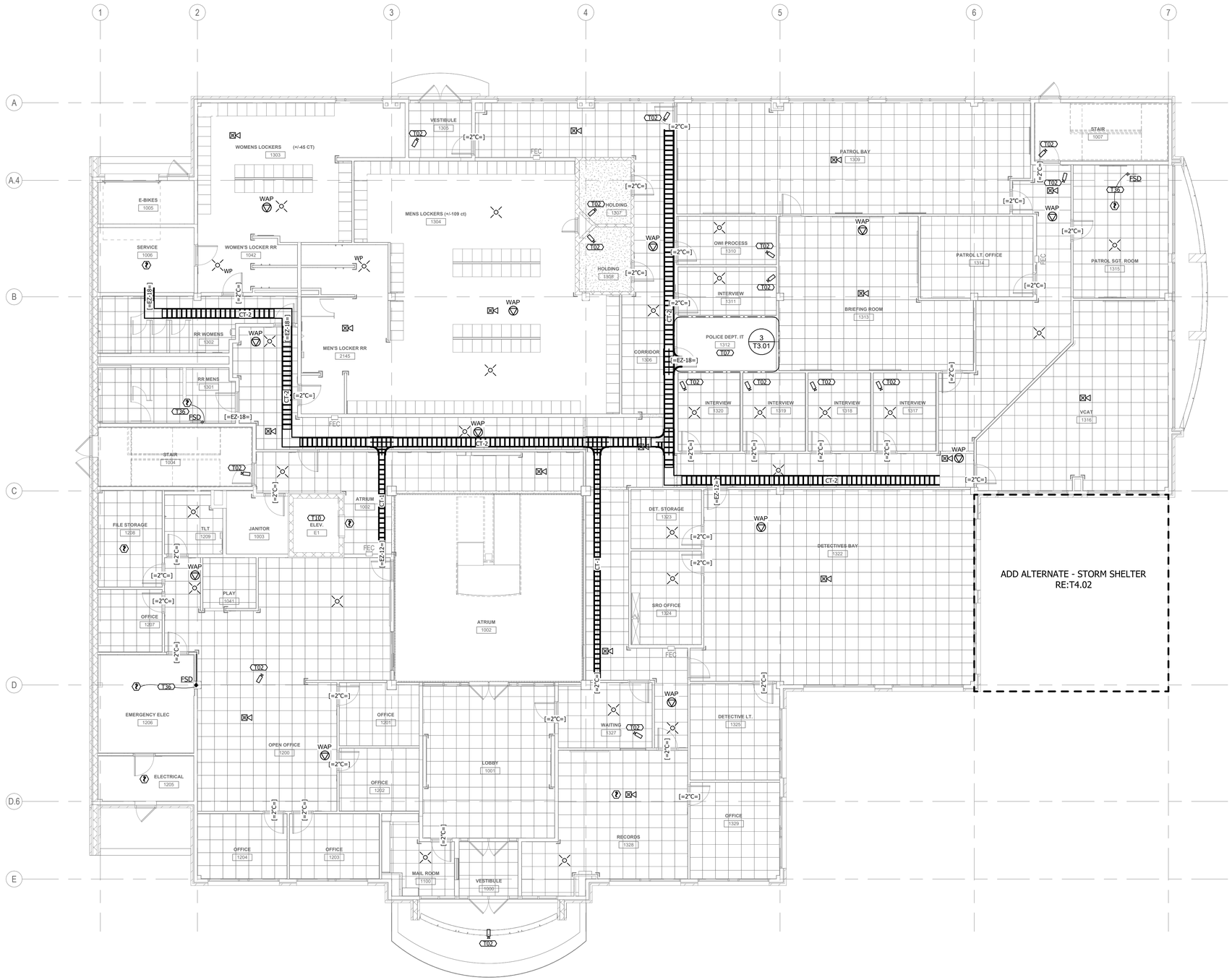

1 FIRST FLOOR LOW VOLTAGE CEILING PLAN
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.

B. ALL CABLE TRAY ROUTING IS FOR SCHEMATIC PURPOSES ONLY. ELECTRICAL CONTRACTOR SHALL COORDINATE ROUTING OF CABLE TRAY WITH OTHER TRADES, AND WHEN NECESSARY, TRANSITION TO AVOID OBSTRUCTIONS.

C. WHERE HORIZONTAL STRUCTURED CABLING NEEDS TO PENETRATE A WALL, CONTRACTOR SHALL INSTALL A MINIMUM OF (2) 2" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. (1) CONDUIT SHALL SERVE CATEGORY CABLING. WHERE FIRE ALARM WIRING NEEDS TO PENETRATE A WALL CONTRACTOR SHALL INSTALL A MINIMUM OF (1) 3/4" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. DO NOT EXCEED 40% PIPE FILL.

D. FIRE ALARM INITIATING DEVICES SHALL NOT BE INSTALLED WITHIN 36 INCHES HORIZONTALLY FROM FORCED AIR HVAC DIFFUSERS OR THE END OF CEILING FAN BLADES.

E. VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED, OWNER INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CATEGORY 6 CABLE TERMINATED ON A BISCUIT JACK ABOVE CEILING AND ROUTED PER T4.01 TO ELECTRICAL/IT STORAGE 2008.

F. ALL WIRELESS ACCESS POINTS SHALL BE SERVED WITH TWO (2) CATEGORY 6 CABLES. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL WAP CABLING AND PATHWAYS.

REFERENCED NOTES

T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T07 TELECOM ROOM. REFER TO ENLARGED PLANS FOR LAYOUT OF NETWORK EQUIPMENT, SECURITY EQUIPMENT, FIRE ALARM, AND ADDITIONAL LOW VOLTAGE SYSTEMS.

T10 FIRE ALARM CONTRACTOR SHALL PROVIDE CODE-COMPLIANT DETECTION, MONITORING, AND CONTROL FOR EXISTING ELEVATOR HOISTWAY AND EQUIPMENT. REUSE EXISTING ELEVATOR CAB CALL STATION AND ASSOCIATED CABLING; ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SYSTEM IS FUNCTIONAL AND PROVIDE MODIFICATIONS AS REQUIRED. COORDINATE REQUIRED TELEPHONE/NETWORK CONNECTIONS, PATHWAYS, AND INTERFACES WITH FIRE ALARM AND STRUCTURED CABLING CONTRACTOR.

T36 MECHANICAL CONTRACTOR FIRE/SMOKE DAMPER. FIRE ALARM CONTRACTOR SHALL PROVIDE CODE COMPLIANT DETECTION. COORDINATE LOCATIONS AND REQUIREMENTS FOR SMOKE AND FIRE/SMOKE DAMPERS WITH THE MECHANICAL CONTRACTOR. REFER TO MECHANICAL PLANS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. COORDINATE REMOTE TEST SWITCH LOCATION WITH DESIGN TEAM.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
FIRST FLOOR LOW VOLTAGE CEILING PLAN

SHEET:
T2.01

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1 SECOND FLOOR LOW VOLTAGE CEILING PLAN
1/8" = 1'-0"

24-187 - CITY HALL RELOCATION

GENERAL NOTES:

A. REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.

B. ALL CABLE TRAY ROUTING IS FOR SCHEMATIC PURPOSES ONLY. ELECTRICAL CONTRACTOR SHALL COORDINATE ROUTING OF CABLE TRAY WITH OTHER TRADES, AND WHEN NECESSARY, TRANSITION TO AVOID OBSTRUCTIONS.

C. WHERE HORIZONTAL STRUCTURED CABLING NEEDS TO PENETRATE A WALL, CONTRACTOR SHALL INSTALL A MINIMUM OF (2) 2" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. (1) CONDUIT SHALL SERVE CATEGORY CABLING. WHERE FIRE ALARM WIRING NEEDS TO PENETRATE A WALL CONTRACTOR SHALL INSTALL A MINIMUM OF (1) 3/4" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. DO NOT EXCEED 40% PIPE FILL.

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E. VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED, OWNER INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CATEGORY 6 CABLE TERMINATED ON A BISCUIT JACK ABOVE CEILING AND ROUTED PER T4.01 TO ELECTRICAL/IT STORAGE 2008.

F. ALL WIRELESS ACCESS POINTS SHALL BE SERVED WITH TWO (2) CATEGORY 6 CABLES. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL WAP CABLING AND PATHWAYS.

REFERENCED NOTES

T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' OF SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T07 TELECOM ROOM. REFER TO ENLARGED PLANS FOR LAYOUT OF NETWORK EQUIPMENT, SECURITY EQUIPMENT, FIRE ALARM, AND ADDITIONAL LOW VOLTAGE SYSTEMS.

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T12 A/V CONTRACTOR SHALL FURNISH AND INSTALL A/V SYSTEM. REFER TO BILL OF MATERIALS, LINE DRAWINGS, MOUNTING ELEVATIONS, AND RACK DIAGRAMS FOR FURTHER INFORMATION.

T36 MECHANICAL CONTRACTOR FIRE/SMOKE DAMPER. FIRE ALARM CONTRACTOR SHALL PROVIDE CODE COMPLIANT DETECTION. COORDINATE LOCATIONS AND REQUIREMENTS FOR SMOKE AND FIRE/SMOKE DAMPERS WITH THE MECHANICAL CONTRACTOR. REFER TO MECHANICAL PLANS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. COORDINATE REMOTE TEST SWITCH LOCATION WITH DESIGN TEAM.

T49 FIRE ALARM CONTRACTOR SHALL PROVIDE REQUIRED RELAY, CONTROL WIRING, PROGRAMMING, AND CONNECTIONS TO INTERFACE EXISTING FIRE SHUTTER OPERATOR WITH FIRE ALARM SYSTEM. COORDINATE FINAL CONNECTIONS AND SEQUENCE OF OPERATION WITH ELECTRICAL CONTRACTOR AND EXISTING FIRE SHUTTER CONTROLS.

NOTE:
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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
SECOND FLOOR LOW VOLTAGE CEILING PLAN

SHEET:
T2.02

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1 THIRD FLOOR LOW VOLTAGE CEILING PLAN
1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.

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T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T07 TELECOM ROOM. REFER TO ENLARGED PLANS FOR LAYOUT OF NETWORK EQUIPMENT, SECURITY EQUIPMENT, FIRE ALARM, AND ADDITIONAL LOW VOLTAGE SYSTEMS.

T10 FIRE ALARM CONTRACTOR SHALL PROVIDE CODE-COMPLIANT DETECTION, MONITORING, AND CONTROL FOR EXISTING ELEVATOR HOISTWAY AND EQUIPMENT. REUSE EXISTING ELEVATOR CAB CALL STATION AND ASSOCIATED CABLING; ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING SYSTEM IS FUNCTIONAL AND PROVIDE MODIFICATIONS AS REQUIRED. COORDINATE REQUIRED TELEPHONE/NETWORK CONNECTIONS, PATHWAYS, AND INTERFACES WITH FIRE ALARM AND STRUCTURED CABLING CONTRACTOR.

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T37 AUDIO VIDEO EQUIPMENT SERVING COUNCIL CHAMBERS SHALL BE RELOCATED AND INSTALLED BY OWNER'S AV INSTALLER. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL PATHWAYS WITH OWNER'S AV INSTALLER PRIOR TO INSTALLATION.

T48 CONDUIT PATHWAYS CALLED OUT FOR AV SYSTEMS SHALL RUN UP WALL AND TERMINATE ABOVE CEILING. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH AV CONTRACTOR FOR ALL CONDUIT PLACEMENT AND TERMINATION IN THE COUNCIL CHAMBERS.

T49 FIRE ALARM CONTRACTOR SHALL PROVIDE REQUIRED RELAY, CONTROL WIRING, PROGRAMMING, AND CONNECTIONS TO INTERFACE EXISTING FIRE SHUTTER OPERATOR WITH FIRE ALARM SYSTEM. COORDINATE FINAL CONNECTIONS AND SEQUENCE OF OPERATION WITH ELECTRICAL CONTRACTOR AND EXISTING FIRE SHUTTER CONTROLS.

NOTE:
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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: THIRD FLOOR LOW VOLTAGE CEILING PLAN

SHEET: T2.03

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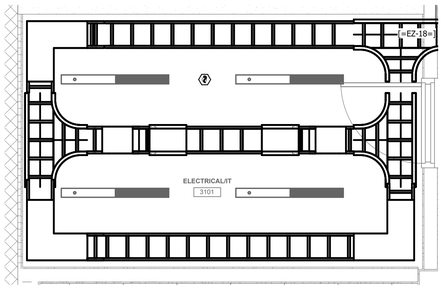
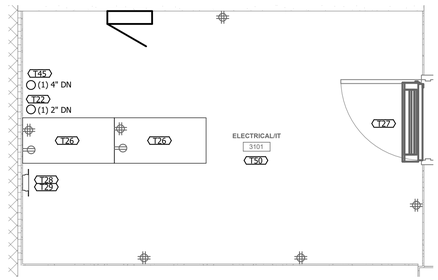
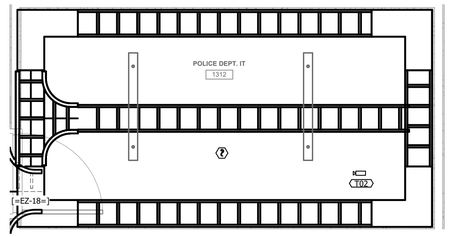


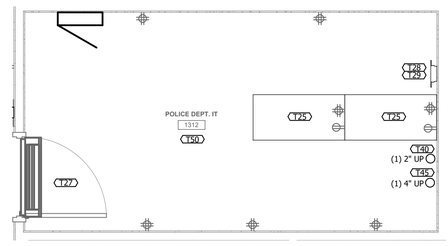
1 THIRD FLOOR LOW VOLTAGE IDF CEILING PLAN
3/8" = 1'-0"



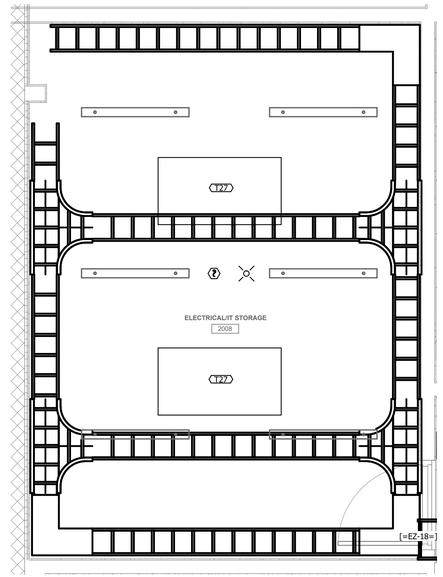
2 THIRD FLOOR LOW VOLTAGE IDF FLOOR PLAN
3/8" = 1'-0"



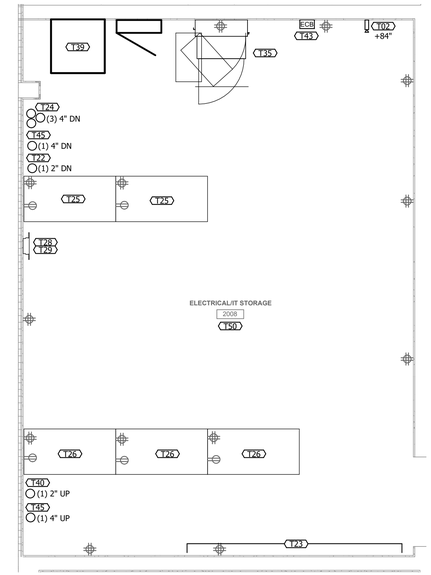
3 FIRST FLOOR LOW VOLTAGE IDF CEILING PLAN
3/8" = 1'-0"



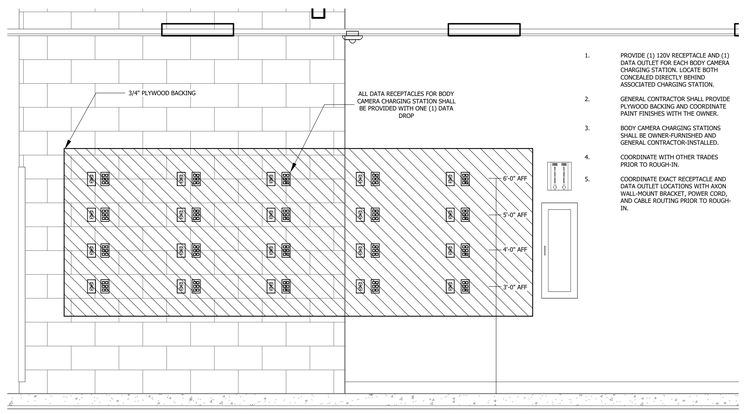
4 FIRST FLOOR LOW VOLTAGE IDF FLOOR PLAN
3/8" = 1'-0"



5 SECOND FLOOR LOW VOLTAGE MDF CEILING PLAN
3/8" = 1'-0"



6 SECOND FLOOR LOW VOLTAGE MDF FLOOR PLAN
3/8" = 1'-0"



7 FIRST FLOOR BODY CAMERA CHARGING STATION ELEVATION
No Scale

GENERAL NOTES:

1. ALL TRADES INVOLVED IN THE BUILD-OUT OF THE TELECOMMUNICATIONS ROOM SHALL PARTICIPATE IN A COORDINATION MEETING PRIOR TO THE START OF WORK. ALL TELECOMMUNICATIONS AND SPECIAL SYSTEMS SUBMITTALS SHALL BE HELD UNTIL THE MEETING IS COMPLETE. COORDINATE THROUGH THE GENERAL CONTRACTOR.
2. ALL WALLS WITHIN TELECOMMUNICATIONS ROOMS SHALL BE LINED WITH 4' X 8' SHEETS OF 3/4" AC GRADE FIRE RETARDANT PLYWOOD, MOUNTED 10" AFF, PAINTED WHITE WITH FIRE RETARDANT PAINT. LEAVE FIRE RATED WOOD STAMP VISIBLE FOR INSPECTION. PLYWOOD SHALL BE CONTINUOUS INTO ALL CORNERS.
3. PROVIDE DEDICATED PERIMETER BASKET STYLE CABLE TRAY FOR ALL RACK AND EQUIPMENT INTERCONNECTIVITY.
4. ALL CABLING SHALL BE NEATLY BUNDLED AND MANAGED USING VELCRO STRAPS. PROVIDE REQUIRED SUPPORTS, ACCESSORIES, AND TRANSITIONS TO MAINTAIN MANUFACTURER RECOMMENDED BEND RADII.
5. ALL WALL MOUNTED POWER WITHIN TELECOMMUNICATIONS ROOMS SHALL BE SURFACE MOUNTED IN CONDUIT. LOCATIONS SHALL BE COORDINATED WITH ALL AFFECTED TRADES.

REFERENCED NOTES

T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T22 ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 2" CONDUIT PATHWAY FROM THE MDF/IDF, THROUGH THE FLOOR ASSEMBLY, TO THIS FLOOR'S IDF. PROVIDE EZ-PATH FIRE-RATED PATHWAY DEVICES AT ALL APPLICABLE RATED PENETRATIONS. STRUCTURED CABLING CONTRACTOR SHALL UTILIZE THE PATHWAY AND PROVIDE ONE (1) 12-COUNT, SINGLE-MODE, PLENUM-RATED FIBER-OPTIC CABLE. PROVIDE AND TERMINATE FIBER IN RACK-MOUNTED PATCH PANELS AT BOTH ENDS.

T23 DEDICATED WALL SPACE TO HOST DOOR ACCESS HEAD END COMPONENTS.

T24 TELECOM SERVICE ENTRANCE. ELECTRICAL CONTRACTOR SHALL PROVIDE THREE (3) 4" CONDUIT PATHWAYS WITH PULL STRINGS FROM THE EXISTING TELECOM HANDHOLE TO THE MDF IN ELECTRICAL/IT STORAGE 2008. STRUCTURED CABLING CONTRACTOR SHALL COORDINATE EXISTING FIBER SERVICE AND FINAL PATHWAY UTILIZATION WITH THE OWNER'S TELECOM UTILITY/ISP. REFER TO SITE PLAN AND TECHNOLOGY RISER FOR ADDITIONAL COORDINATION.

T25 POLICE DEPARTMENT UTILIZED TELECOM RACK SHALL BE PROVIDED BY THE STRUCTURED CABLING CONTRACTOR. REFER TO ENLARGED PLANS FOR ADDITIONAL INFORMATION.

T26 CITY UTILIZED TELECOM RACK SHALL BE PROVIDED BY THE STRUCTURED CABLING CONTRACTOR. REFER TO ENLARGED PLANS FOR ADDITIONAL INFORMATION.

T27 LOCATION OF HVAC UNIT. COORDINATE CONTROL LOCATION WITH OWNER PRIOR TO ROUGH-IN.

T28 ALL NEW FIBER OPTIC CABLING SHALL HAVE A 20' SERVICE LOOP PLACED AND NEATLY MANAGED IN A COIL ABOVE OR BELOW THE TRAY.

T29 GROUNDING BUSBAR SHALL BE LOW VOLTAGE CONTRACTOR PROVIDED AND INSTALLED.

T35 AV RACK, SEE TECHNOLOGY DETAIL SHEETS FOR MORE INFORMATION. AV CONTRACTOR SHALL PROVIDE ALL PARTS AND PIECES FOR A WORKING AV SYSTEM.

T39 UPS. OWNER SHALL PROVIDE THE UPS. OWNER'S CONTRACTOR SHALL INSTALL, CONNECT, AND COMMISSION THE UPS, INCLUDING FINAL CONNECTIONS TO THE DESIGNATED EQUIPMENT. COORDINATE POWER REQUIREMENTS AND FINAL CONNECTIONS WITH THE ELECTRICAL CONTRACTOR.

T40 FLOOR PENETRATION FROM FLOOR ABOVE. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 2" CONDUIT PATHWAY FROM THE MDF/IDF ON THE FLOOR ABOVE, THROUGH THE FLOOR ASSEMBLY, TO THE IDF ON THIS FLOOR. PROVIDE EZ-PATH FIRE-RATED PATHWAY DEVICES AT ALL APPLICABLE RATED PENETRATIONS. STRUCTURED CABLING CONTRACTOR SHALL UTILIZE THE PATHWAY AND PROVIDE ONE (1) 12-COUNT, SINGLE-MODE, PLENUM-RATED FIBER-OPTIC CABLE. PROVIDE AND TERMINATE FIBER IN RACK-MOUNTED PATCH PANELS AT BOTH ENDS.

T43 FIRE ALARM CONTRACTOR SHALL PROVIDE POWER SUPPLY TO SERVE THE ELEVATOR TWO-WAY COMMUNICATION SYSTEM. PROVIDE BATTERIES, MODULES, CONNECTIONS, AND ACCESSORIES REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. COORDINATE 120V POWER AND FINAL CONNECTIONS WITH THE ELECTRICAL CONTRACTOR.

T45 ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 4" CONDUIT SLEEVE BETWEEN FLOORS. ELECTRICAL CONTRACTOR SHALL PROVIDE VERTICAL BASKET-STYLE CABLE TRAY FROM THE FLOOR PENETRATION TO THE HORIZONTAL CABLE TRAY ON EACH FLOOR, INCLUDING ALL SUPPORTS, FITTINGS, TRANSITIONS, AND ACCESSORIES. PROVIDE FIRE-RATED PATHWAY DEVICES AT RATED ASSEMBLIES AND COORDINATE EXACT LOCATION WITH STRUCTURE AND OTHER TRADES PRIOR TO ROUGH-IN.

T50 CLEAN AGENT FIRE SUPPRESSION SYSTEM. FIRE ALARM CONTRACTOR SHALL PROVIDE REQUIRED MONITORING, INTERFACE MODULES, CABLING, PROGRAMMING, AND CONNECTION TO THE BUILDING FIRE ALARM CONTROL PANEL. COORDINATE SYSTEM ALARM, TROUBLE, SUPERVISORY, AND RELEASE STATUS INTERFACES WITH CLEAN AGENT SYSTEM CONTRACTOR. CLEAN AGENT DETECTION, RELEASING CONTROLS, AND ASSOCIATED EQUIPMENT SHALL BE PROVIDED AS PART OF THE CLEAN AGENT SYSTEM.

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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Description	Date	No.

OWNER SIGN-OFF:

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ENLARGED PLANS LOW VOLTAGE

SHEET:
T3.01

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TELECOM RACK LAYOUT

	POLICE DEPT #1	POLICE DEPT #2	CITY HALL #1	CITY HALL #2	CITY HALL #3	POLICE DEPT #3	POLICE DEPT #4	CITY HALL #4	CITY HALL #5
MANUFACTURER	CHATSWORTH	CHATSWORTH	CHATSWORTH	CHATSWORTH	CHATSWORTH	CHATSWORTH	CHATSWORTH	CHATSWORTH	CHATSWORTH
MODEL	15213-703	15213-703	ZB11-A1000-71	ZB11-A1000-71	ZB11-A1000-71	ZB11-A1000-71	ZB11-A1000-71	ZB11-A1000-71	ZB11-A1000-71
HEIGHT (RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)	84" (45 RU)
WIDTH	19"	19"	19"	19"	19"	19"	19"	19"	19"
DEPTH	22"	22"	22"	22"	22"	22"	22"	22"	22"
TYPE	4 POST	4 POST	4 POST	4 POST	4 POST	4 POST	4 POST	4 POST	4 POST
MOUNTING	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR	FLOOR
DOOR STYLE	-	-	-	-	-	-	-	-	-
CABLE MANAGEMENT	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL	HORIZONTAL AND VERTICAL
POWER DISTRIBUTION	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL	VERTICAL
VENTILATION	-	-	-	-	-	-	-	-	-
POWER CIRCUITS	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP	ONE (1) 20 AMP
LOCATION	POLICE DEPT. IT 1312	POLICE DEPT. IT 1312	ELECTRICAL/IT STORAGE 2008	ELECTRICAL/IT STORAGE 2008	ELECTRICAL/IT STORAGE 2008	ELECTRICAL/IT STORAGE 2008	ELECTRICAL/IT STORAGE 2008	ELECTRICAL 3101	ELECTRICAL 3101

	POLICE DEPT #1	POLICE DEPT #2	CITY HALL #1	CITY HALL #2	CITY HALL #3	POLICE DEPT #3	POLICE DEPT #4	CITY HALL #4	CITY HALL #5
1	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
2	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS	FUTURE FIBER CONNECTIONS
3									
4									
5									
6	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
7	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE
8	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE	FUTURE
9	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH
10	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL
11									
12	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT
13									
14	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
15	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	48 PORT SWITCH	RESERVED FOR OFOI NVR	BLANK	48 PORT SWITCH	48 PORT SWITCH
16	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL	PATCH PANEL		BLANK	PATCH PANEL	PATCH PANEL
17						BLANK	BLANK		
18	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT	BLANK	BLANK	HORIZONTAL MANAGEMENT	HORIZONTAL MANAGEMENT
19	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
20	48 PORT SWITCH	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	48 PORT SWITCH	BLANK
21	PATCH PANEL	48 PORT SWITCH	BLANK	BLANK	BLANK	BLANK	BLANK	PATCH PANEL	BLANK
22		PATCH PANEL	BLANK	BLANK	BLANK	BLANK	BLANK		BLANK
23	HORIZONTAL MANAGEMENT		BLANK	BLANK	BLANK	BLANK	BLANK	HORIZONTAL MANAGEMENT	BLANK
24		HORIZONTAL MANAGEMENT	BLANK	BLANK	BLANK	BLANK	BLANK		BLANK
25	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
26	48 PORT SWITCH	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
27	PATCH PANEL	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
28		BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
29	HORIZONTAL MANAGEMENT	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
30		BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
31	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
32	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
33	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
34	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
35	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
36	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
37	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
38	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
39	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
40	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
41	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
42	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
43	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
44									
45	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS	RESERVED FOR OFOI UPS

6" DOUBLE SIDED VERTICAL WIRE MANAGER | 12" DOUBLE SIDED VERTICAL WIRE MANAGER | 6" DOUBLE SIDED VERTICAL WIRE MANAGER

RACK LAYOUT IS PRELIMINARY FOR BID PURPOSES ONLY. FINAL RACK LAYOUT SHALL BE COORDINATED WITH OWNER DURING CONSTRUCTION

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

24-187 - CITY HALL RELOCATION

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IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
ENLARGED PLANS LOW VOLTAGE

SHEET:
T3.02

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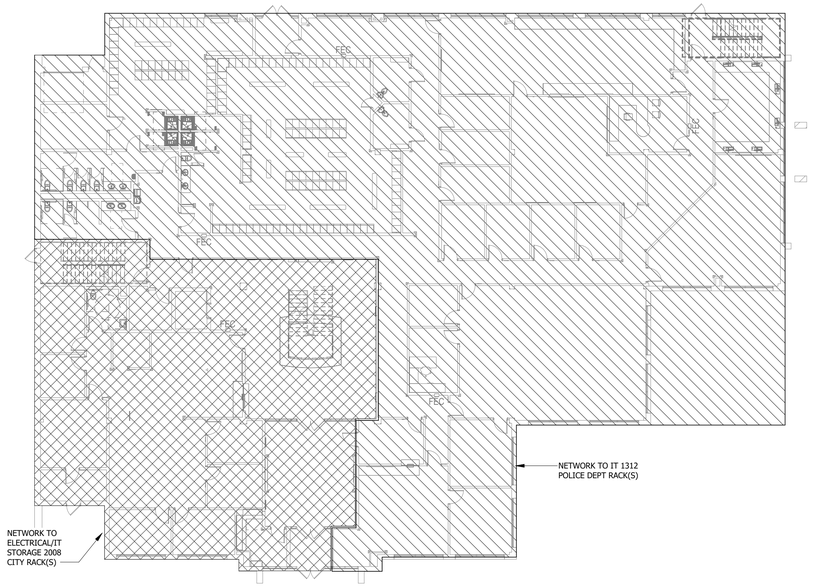
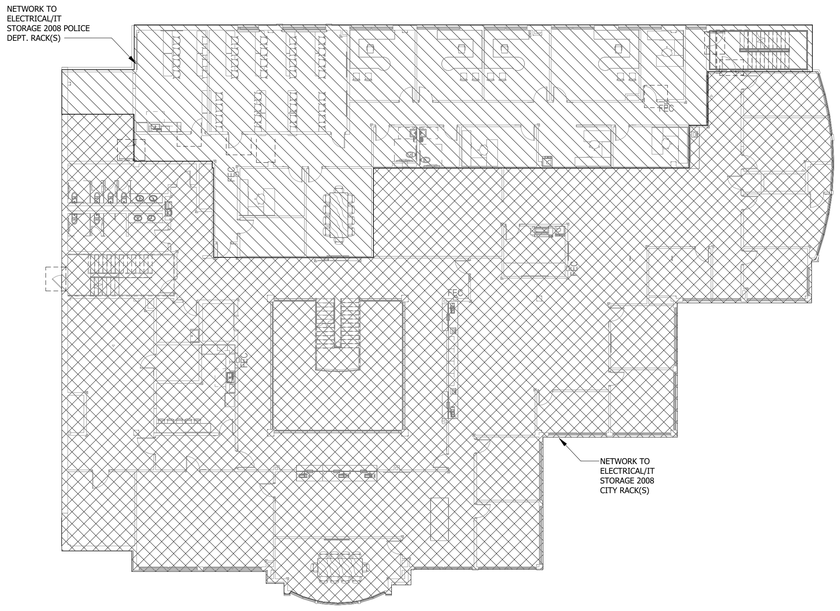
GENERAL NOTES:

1. ALL TRADES INVOLVED IN THE BUILD-OUT OF THE TELECOMMUNICATIONS ROOM SHALL PARTICIPATE IN A COORDINATION MEETING PRIOR TO THE START OF WORK. ALL TELECOMMUNICATIONS AND SPECIAL SYSTEMS SUBMITTALS SHALL BE HELD UNTIL THE MEETING IS COMPLETE. COORDINATE THROUGH THE GENERAL CONTRACTOR.
2. ALL WALLS WITHIN TELECOMMUNICATIONS ROOMS SHALL BE LINED WITH 4' X 8' SHEETS OF 3/4" AC GRADE FIRE RETARDANT PLYWOOD, MOUNTED 10" AFF, PAINTED WHITE WITH FIRE RETARDANT PAINT. LEAVE FIRE RATED WOOD STAMP VISIBLE FOR INSPECTION. PLYWOOD SHALL BE CONTINUOUS INTO ALL CORNERS.
3. PROVIDE DEDICATED PERIMETER BASKET STYLE CABLE TRAY FOR ALL RACK AND EQUIPMENT INTERCONNECTIVITY.
4. ALL CABLING SHALL BE NEATLY BUNDLED AND MANAGED USING VELCRO STRAPS. PROVIDE REQUIRED SUPPORTS, ACCESSORIES, AND TRANSITIONS TO MAINTAIN MANUFACTURER RECOMMENDED BEND RADII.
5. ALL WALL MOUNTED POWER WITHIN TELECOMMUNICATIONS ROOMS SHALL BE SURFACE MOUNTED IN CONDUIT. LOCATIONS SHALL BE COORDINATED WITH ALL AFFECTED TRADES.
6. **ALL SECURITY CAMERA CABLING SHALL BE TERMINATED IN ELECTRICAL/IT STORAGE 2008. COORDINATE WITH OWNER FOR SPECIFIC RACK TERMINATION.**



N

1 LOW VOLTAGE FIRST FLOOR MAPPING
1/16" = 1'-0"



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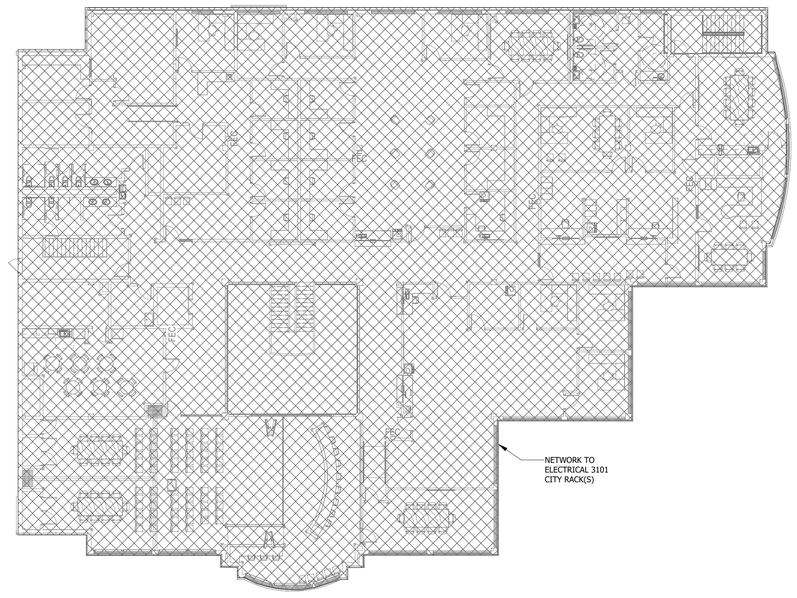
3 LOW VOLTAGE SECOND FLOOR MAPPING
1/16" = 1'-0"



N

2 LOW VOLTAGE THIRD FLOOR MAPPING
1/16" = 1'-0"

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
IT CLOSET MAPPING

SHEET:
T4.01

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GENERAL NOTES:

A. **REFER TO ME AND E DEMO SHEETS FOR ADDITIONAL WORK ON SITE, ELEVATOR, AND ROOF LOCATIONS.**

B. SURFACE RACEWAY IS NOT TO BE USED IN ANY FINISHED AREAS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT.

C. WHERE HORIZONTAL LOW VOLTAGE CABLING NEEDS TO PENETRATE A WALL, CONTRACTOR SHALL INSTALL A MINIMUM OF (2) 2" CONDUIT SLEEVES WITH INSULATED BUSHINGS UNLESS INDICATED OTHERWISE. (1) CONDUIT SHALL SERVE CATEGORY CABLING. DO NOT EXCEED 40% PIPE FILL.

D. INSTALL DEVICES SUCH THAT NO TWO DEVICES ON OPPOSITE SIDES OF SAME WALL ARE WITHIN 6" OF EACH OTHER.

E. COORDINATE ELECTRICAL REQUIREMENTS WITH DOOR CONTRACTOR PRIOR TO INSTALLATION.

F. COORDINATE ALL DEVICES WITH ARCHITECTURAL PLANS, CASEWORK SUBMITTALS, & OWNER PROVIDED EQUIPMENT.

G. ALL DEVICES CALLED OUT TO BE INSTALLED AT NON-STANDARD HEIGHTS SHALL BE VERIFIED WITH DESIGN TEAM PRIOR TO ROUGH-IN.

H. ALL NEW WORK INDICATED IN EXISTING WALLS SHALL BE INSTALLED WITH CONCEALED WIRING AND FLUSH-MOUNTED DEVICES. CUTTING AND PATCHING SHALL BE BY GENERAL CONTRACTOR.

I. FIRE ALARM INITIATING DEVICES SHALL NOT BE INSTALLED WITHIN 36 INCHES HORIZONTALLY FROM FORCED AIR HVAC DIFFUSERS OR THE END OF CEILING FAN BLADES.

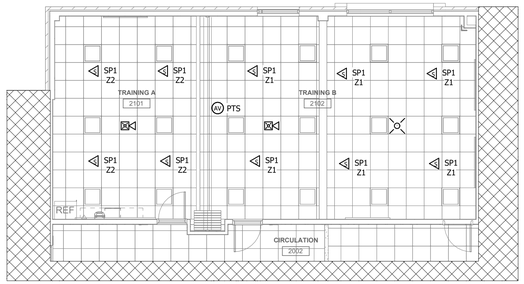
REFERENCED NOTES

T01 ACCESS CONTROLLED DOOR. REFER TO LOW VOLTAGE DETAILS AND ARCHITECTURAL SPECIFICATION SECTION 08-7100 FOR OPERATION AND FURTHER ROUGH-IN/BIDDING INFORMATION. COORDINATE ALL DOORHOLDS, CARD READERS, ADA PUSHBUTTONS, AND OTHER ACCESSORIES WITH DESIGN TEAM PRIOR TO ROUGH-IN.

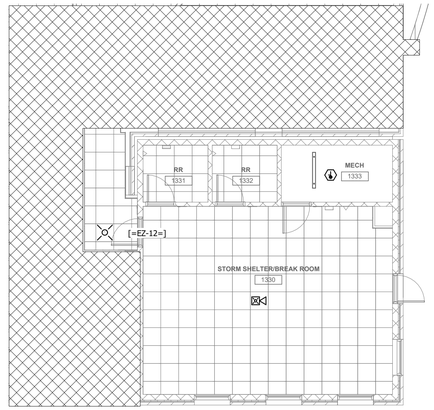
T02 VIDEO SURVEILLANCE CAMERAS SHALL BE OWNER FURNISHED AND INSTALLED. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ONE (1) CAT 6 CABLE TO BISCUIT JACK ABOVE CEILING, ROUTED PER IT CLOSET MAPPING DETAIL. PROVIDE 20' SERVICE LOOP AT ACCESSIBLE CEILINGS; AT EXPOSED LOCATIONS, CONCEAL CABLING AND LOCATE SERVICE LOOP AT CLOSET.

T08 DISPLAYS AND MOUNTS SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN ONLY. LOCATION SHALL BE COORDINATED WITH OWNER PRIOR TO ROUGH-IN.

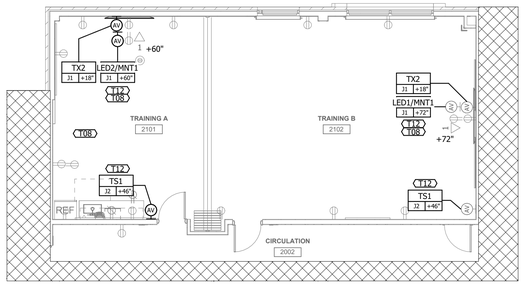
T12 A/V CONTRACTOR SHALL FURNISH AND INSTALL A/V SYSTEM. REFER TO BILL OF MATERIALS, LINE DRAWINGS, MOUNTING ELEVATIONS, AND RACK DIAGRAMS FOR FURTHER INFORMATION.



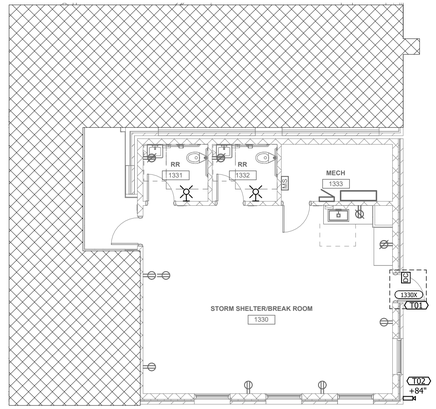
3 SECOND FLOOR LOW VOLTAGE CEILING PLAN - ADD ALTERNATE
1/8" = 1'-0"



4 FIRST FLOOR LOW VOLTAGE CEILING PLAN - ADD ALTERNATE
1/8" = 1'-0"



2 SECOND FLOOR LOW VOLTAGE FLOOR PLAN- ADD ALTERNATE
1/8" = 1'-0"



1 FIRST FLOOR LOW VOLTAGE FLOOR PLAN - ADD ALTERNATE
1/8" = 1'-0"

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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SHEET SET:
BID DOCUMENTS

SHEET NAME:
LOW VOLTAGE ADD ALTERNATE PLAN VIEWS

SHEET:
T4.02

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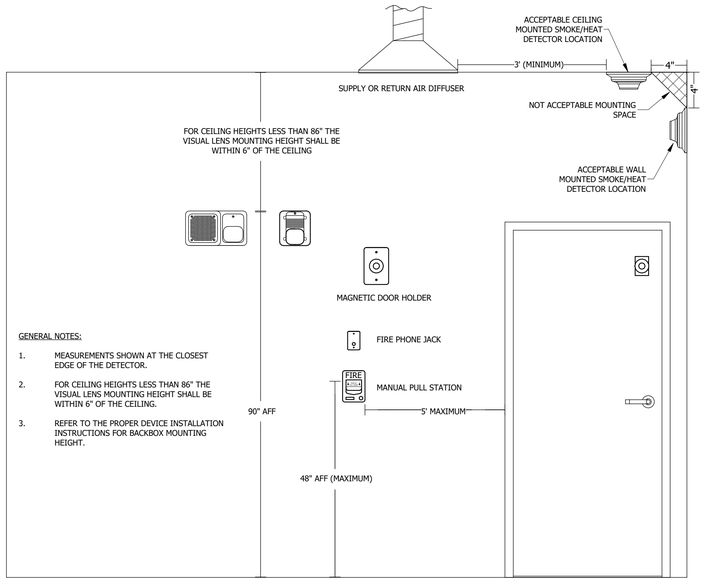
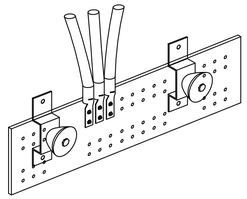


GENERAL NOTES:

1. MEASUREMENTS SHOWN AT THE CLOSEST EDGE OF THE DETECTOR.
2. FOR CEILING HEIGHTS LESS THAN 86" THE VISUAL LENS MOUNTING HEIGHT SHALL BE WITHIN 6" OF THE CEILING.
3. REFER TO THE PROPER DEVICE INSTALLATION INSTRUCTIONS FOR BACKBOX MOUNTING HEIGHT.

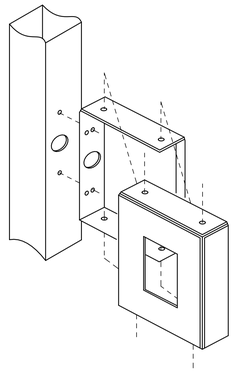
1 FIRE ALARM MOUNTING DETAILS
No Scale



GROUND BAR NOTES:

1. INSTALL A 1/4" X 4" X 24" SOLID COPPER GROUND BAR WITH INSULATORS AND BRACKETS EQUAL TO ERITECH "EGBA" SERIES GROUND BAR WHERE INDICATED ON THE DRAWINGS.
2. GROUND BAR SHALL HAVE A MINIMUM AMPACITY EQUIVALENT TO THE MINIMUM SIZE OF THE GROUNDING ELECTRODE CONDUCTOR ALLOWED BY NEC TABLE 250.66
3. GROUND BAR SHALL HAVE 50% OF ITS OPENINGS UNUSED.

2 LOW VOLTAGE GROUND BAR DETAIL
No Scale



FOR "GLASS MOUNTED" FIRE ALARM PULL STATION, AND SIMILAR DEVICES:

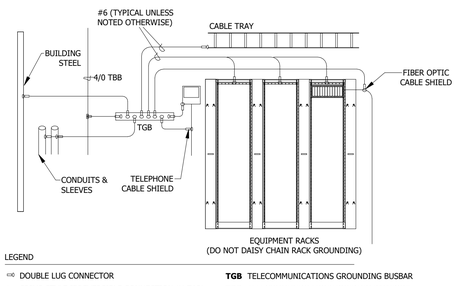
A. PROVIDE A 2 PIECE ASSEMBLY THAT ALLOWS FOR THE PROPER INSTALLATION TO THE SIDE OF A STEEL OR ALUMINUM CHANNEL FRAMED GLASS WALL FOR DEVICES THAT MAINTAIN A "SINGLE GANG" MOUNTING FOOTPRINT.
(SPACE AGE ELECTRONICS SSU03171, PSB PULL STATION BACK BOX OR APPROVED EQUIVALENT)

B. ATTACH UNIT TO FRAME BY HOLDING AGAINST THE GLASS AND CHOOSING THE CORRECT SET OF DOUBLE MOUNTING HOLES TO SECURE THE UNIT TO THE FRAME.

C. PULL WIRE THROUGH OVERSIZED WIRE ENTRY HOLE.

D. MOUNT MANUAL STATION TO THE FRONT OF THE COVER UNIT.

3 GLASS FRAME MOUNTED JUNCTION BOX
1/8" = 1'-0"



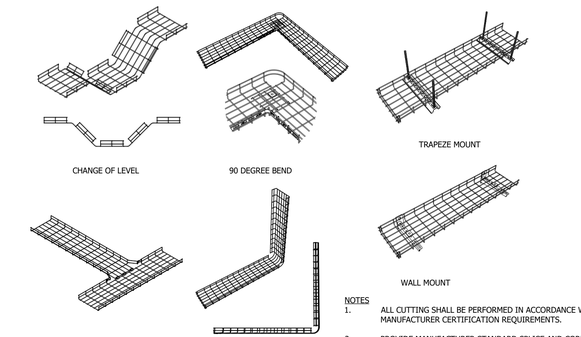
LEGEND

DOUBLE LUG CONNECTOR	**TGB** TELECOMMUNICATIONS GROUNDING BUSBAR
CRIMP STYLE IRREVERSIBLE CONNECTION (H-TAP)	**TBB** TELECOMMUNICATIONS BONDING BACKBONE

NOTES:

1. PROVIDE GROUND CONDUCTOR TO MAIN TELECOM GROUND BUS BAR OR MAIN ELECTRICAL SERVICE PANEL.

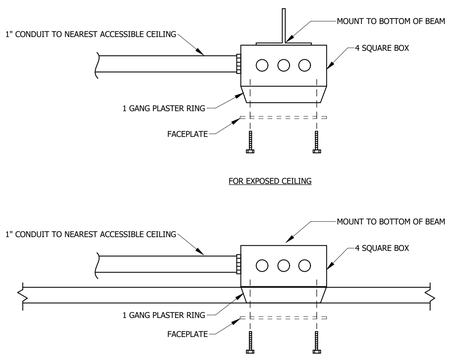
4 LOW VOLTAGE GROUNDING DIAGRAM
No Scale



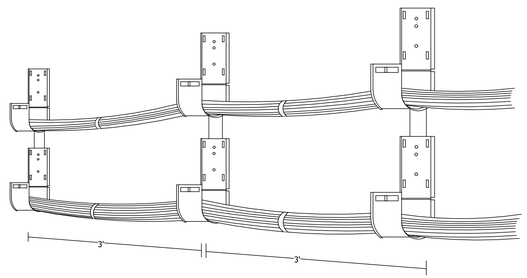
NOTES

1. ALL CUTTING SHALL BE PERFORMED IN ACCORDANCE WITH MANUFACTURER CERTIFICATION REQUIREMENTS.
2. PROVIDE MANUFACTURER STANDARD SPLICE AND CORNER TRANSITION HARDWARE.
3. ALL SINGLE 90 CORNERS AND VERTICAL TRANSITIONS SHALL BE SWEEP RADIUS BENDS.

5 CABLE TRAY DETAILS
No Scale



6 LOW VOLTAGE CEILING ROUGH-IN DETAIL
No Scale



J-HOOK PATHWAY GENERAL NOTES:

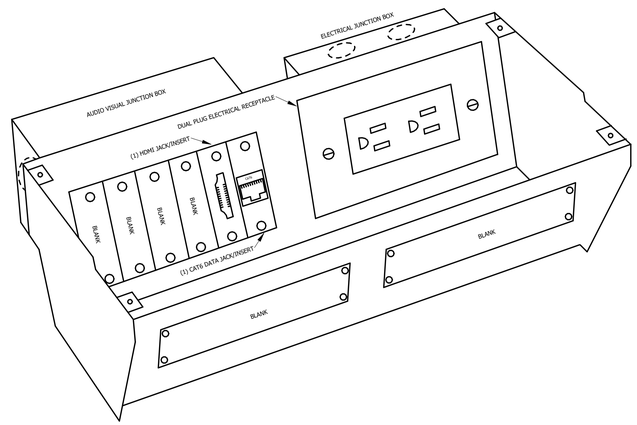
A. **THIS DETAIL ILLUSTRATES ACCEPTABLE INSTALLATION PRACTICES IN ACCESSIBLE CEILING AREAS. IN EXPOSED CEILING LOCATIONS, CABLING SHALL BE CONCEALED IN CONDUIT.**

B. J-HOOKS SHALL BE SPACED 3 FEET APART ON CENTER AND AT A MAXIMUM OF NO MORE THAN 5 FEET APART IN SPACES WHERE 3 FEET IS NOT AN OPTION. LOOSELY BUNDLE CABLE AND MANAGE UTILIZING VELCRO STRIPS.

C. KEEP ALL DATA CABLING ISOLATED FROM OTHER SYSTEMS. J-HOOK SYSTEM SHALL ALLOW OTHER HOOKS TO ATTACH IN A STACKING METHOD. KEEP FIRE ALARM CABLING IN ITS OWN HOOK PATHWAY.

D. WHEN CABLING IS ROUTED TO A CEILING DEVICE, CABLING SHALL BE SUPPORTED AND CABLING KEPT OFF OF ALL CEILING TILES AND ABOVE CEILING EQUIPMENT.

7 J-HOOK PATHWAY DETAIL
No Scale



8 FSR DETAIL
No Scale

NOTE:
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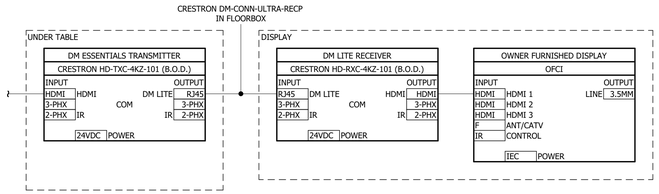


1 AV RISER - WATERLOO CITY HALL TYPICAL CONFERENCE
No Scale

AV EQUIPMENT SCHEDULE

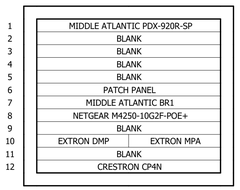
DEVICE	MANUFACTURER	SYMBOL	MODEL	DESCRIPTION	EQUALS
CONFERENCE ROOMS					
VIDEO COMPONENTS					
TRANSMITTER	CRESTRON	TX1	HD-TXC-4KZ-101	DM ESSENTIALS TRANSMITTER FOR HDMI	EXTRON
RECIEVER	CRESTRON	RX1	HD-RXC-4KZ-101	DM ESSENTIALS RECEIVER FOR HDMI	EXTRON
SYSTEM CABLING					
DIGITALMEDIA CABLE	CRESTRON		DM-CBL-ULTRA-P	DIGITALMEDIA ULTRA CABLE (S/FTP)	EXTRON
DIGITALMEDIA CONNECTOR	CRESTRON		DM-CONN-ULTRA-RECP	DIGITALMEDIA ULTRA KEYSTONE JACK	EXTRON
DIGITALMEDIA PATCH CABLE	CRESTRON		DM-CBL-ULTRA-PC SERIES	DITIALMEDIA ULTRA PATCH CABLE (LENGTHS AS REQUIRED)	EXTRON
HDMI CABLE	CRESTRON		CBL-8K-HD SERIES	HDMI PATCH CABLE (LENGTHS AS REQUIRED)	EXTRON

CABLE TRAY SCHEDULE

LABEL	TYPE	PART #	DIMENSIONS	HOSTED CABLING	PATHWAY EQUIVALENT	MAX CATEGORY CABLING
CT-1	WIRE BASKET	CABLOFIL CF	12" x 4"	NETWORK, SECURITY, AND AV	(6) SERIES 44 EZPATH	301
CT-2	WIRE BASKET	CABLOFIL CF	18" x 4"	NETWORK, SECURITY, AND AV	(6) SERIES 44 EZPATH	450
EZ-12	EZ-PATH CABLE TRAY RETROFIT	EZCTR612	12" x 6"	NETWORK, SECURITY, AND AV	ENGINEER APPROVED EQUAL	SAME AS ASSOCIATED TRAY
EZ-18	EZ-PATH CABLE TRAY RETROFIT	EZCTR618	18" x 6"	NETWORK, SECURITY, AND AV	ENGINEER APPROVED EQUAL	SAME AS ASSOCIATED TRAY

NOTES:

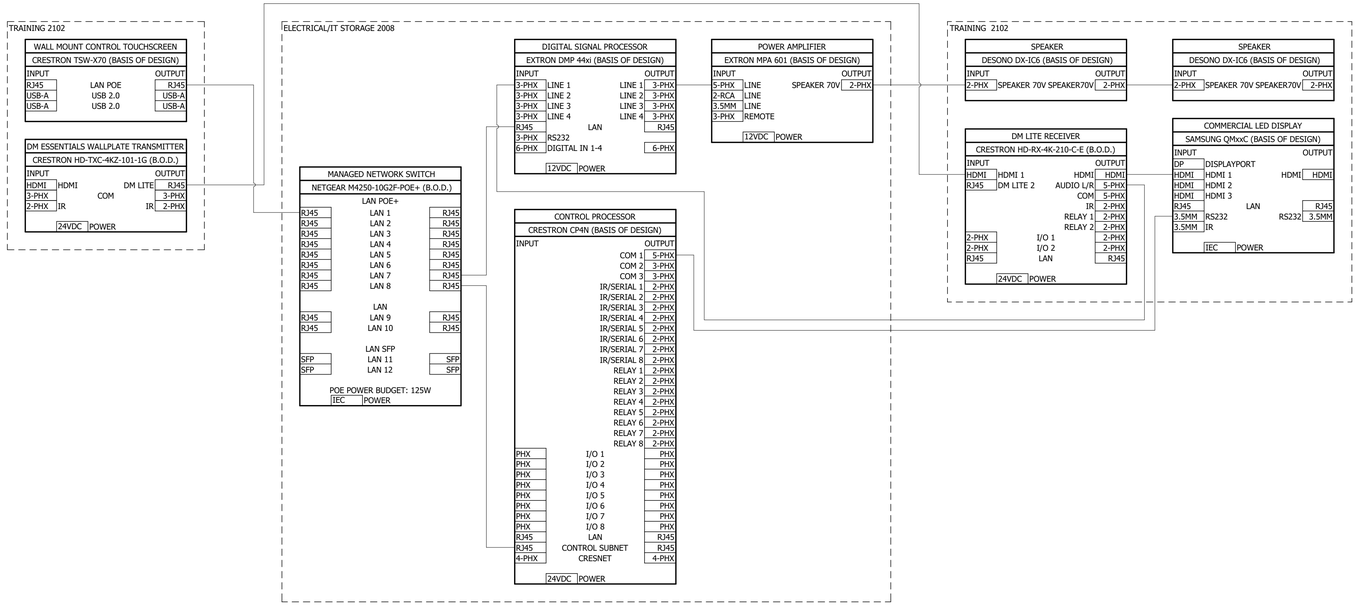
1. BASKET TRAY SHALL NOT BE ROUTED THROUGH RATED WALLS UNLESS CABLE TRAY RETROFIT KIT IS INSTALLED. UTILIZE EZ-PATH FIRE-RATED SLEEVES TO TRANSITION THROUGH ALL RATED WALLS.
2. EZ-PATH CAPACITY THROUGH RATED WALLS SHALL MATCH THE INSTALLED CABLE TRAY CAPACITY.
3. PROVIDE DROP OUT KIT FOR ALL TRANSITIONS INTO RACKS AND TO VERTICAL TRAY RUNS.
4. ALL CABLE TRAY SHALL BE TRAPEZE HUNG WITH UNISTRUT AND ALL THREAD. COORDINATE INSTALLATION WITH ALL TRADES.
5. CABLE TRAY ROUTED IN EXPOSED AREAS (INCLUDING WOOD SLATS, CLOUDS, BAFFLES, AND LARGE GAPS) SHALL BE PAINTED TO MATCH CEILING AND HAVE 3-SIDED PLASTIC TRAY INSERT.



MANUFACTURER	MIDDLE ATLANTIC
MODEL	DWR-12-22
HEIGHT (RU)	28.06" (12 RU)
WIDTH	23.4"
DEPTH	22"
TYPE	CABINET
MOUNTING	WALL
DOOR STYLE	VENTED
CABLE MANAGEMENT	HORIZONTAL AND VERTICAL
POWER DISTRIBUTION	HORIZONTAL
VENTILATION	-
POWER CIRCUITS	ONE (1) 20 AMP
LOCATION	ELECTRICAL/IT STORAGE 2008

AV EQUIPMENT SCHEDULE

DEVICE	MANUFACTURER	SYMBOL	MODEL	DESCRIPTION	EQUALS
BASE BID - TRAINING 2102					
DISPLAYS AND MOUNTS					
85" DISPLAY	SAMSUNG	LED1	QM85C	85" COMMERCIAL GRADE 4K DISPLAY	LG, PANASONIC, SHARP/NEC
WALL MOUNT	CHIEF	MNT1	LTM1U	LARGE UNIVERSAL TILT WALL MOUNT	PEERLESS
AUDIO DSP, AMPLIFIERS, AND SPEAKERS					
AUDIO DSP	EXTRON		DMP 44XI	4X4 FIXED I/O DSP	BOSE, BIAMP, QSC
AMPLIFIER	EXTRON		MPA 601	60W@70V POWER AMPLIFIER	BOSE, JBL, QSC
CEILING SPEAKERS	BIAMP	SP1	DESONO DX-IC6	6.5" CEILING LOUDSPEAKER	BOSE, JBL, QSC
SUMMING TRANSFORMER	RDL		TX-32	UNBALANCED STEREO TO BALANCED MONO TRANSFORMER	EXTRON
VIDEO COMPONENTS					
WALLPLATE TRANSMITTER	CRESTRON	TX2	HD-TXC-4KZ-101-1G	DM ESSENTIALS WALLPLATE TRANSMITTER FOR HDMI	EXTRON
RECEIVER	CRESTRON		HD-RX-4K-210-C-E	DM ESSENTIALS RECEIVER FOR HDMI	EXTRON
CONTROL COMPONENTS					
7" TOUCHSCREEN	CRESTRON	TS1	TSW-770	7" WALL MOUNTED CONTROL TOUCHSCREEN	EXTRON
CONTROL PROCESSOR	CRESTRON		CP4N	4-SERIES CONTROL PROCESSOR W/AV SUBNET	EXTRON
NETWORKING COMPONENTS					
SWITCH	NETGEAR		M4250-10G2F-POE+	10-PORT GIGABIT MANAGED NETWORK SWITCH W/POE+	LUXUL
PATCH PANEL	TRIPP-LITE		N062-012-KJ	12-PORT MODULAR PATCH PANEL	271005
RACKS AND ACCESSORIES					
AV RACK	MIDDLE ATLANTIC	AVR1	DWR-12-22	12RU 22" DEEP WALL MOUNTED RACK	LOWELL
DOOR	MIDDLE ATLANTIC		LVFD-12	12RU VENTED FRONT DOOR	LOWELL
RACK POWER	MIDDLE ATLANTIC		PDX-920R-SP	RACKMOUNT POWER STRIP W/SERIES SURGE PROTECTION	SURGEX
LACING BARS	MIDDLE ATLANTIC		LBP SERIES	HORIZONTAL LACING BAR - OFFSETS AS REQUIRED	LOWELL
LACE STRIPS	MIDDLE ATLANTIC		LACE-OWP SERIES	VERTICAL LACING STRIP - LENGTH AS REQUIRED	LOWELL
RACK BLANKS	MIDDLE ATLANTIC		BL1	ANODIZED PANEL FOR ALL UNUSED OPENINGS	LOWELL
SHELVING	MIDDLE ATLANTIC		UMS1-11.5	UNIVERSAL MOUNTING SHELF	LOWELL
BRUSH PANEL	MIDDLE ATLANTIC		BR1	1RU BRUSH GROMMET PANEL	LOWELL
SYSTEM CABLING					
AUDIO/CONTROL CABLE	BELDEN		9451P	22AWG 2-CONDUCTOR SHIELDED	LIBERTY, WEST PENN, WINDY CITY
SPEAKER CABLE	BELDEN		6200UE	16AWG 2-CONDUCTOR	LIBERTY, WEST PENN, WINDY CITY
CAT6	BELDEN		2413	23AWG 4-PAIR CATEGORY 6 U/UTP	LIBERTY, WEST PENN, WINDY CITY
DIGITALMEDIA CABLE	CRESTRON		DM-CBL-ULTRA-P	DIGITALMEDIA ULTRA CABLE (S/FTP)	EXTRON
HDMI CABLE	CRESTRON		CBL-HD-8K SERIES	HDMI PATCH CABLE (LENGTHS AS REQUIRED)	EXTRON



2 AV RISER - WATERLOO CITY HALL TRAINING - BASE BID
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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Waterloo, IA 50701
319.233.8419
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CONSULTANT:
MEPT
MODUS ENGINEERING

STRUCTURAL
IMEG ENGINEERS

REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
LOW VOLTAGE DETAILS

SHEET:
T5.02

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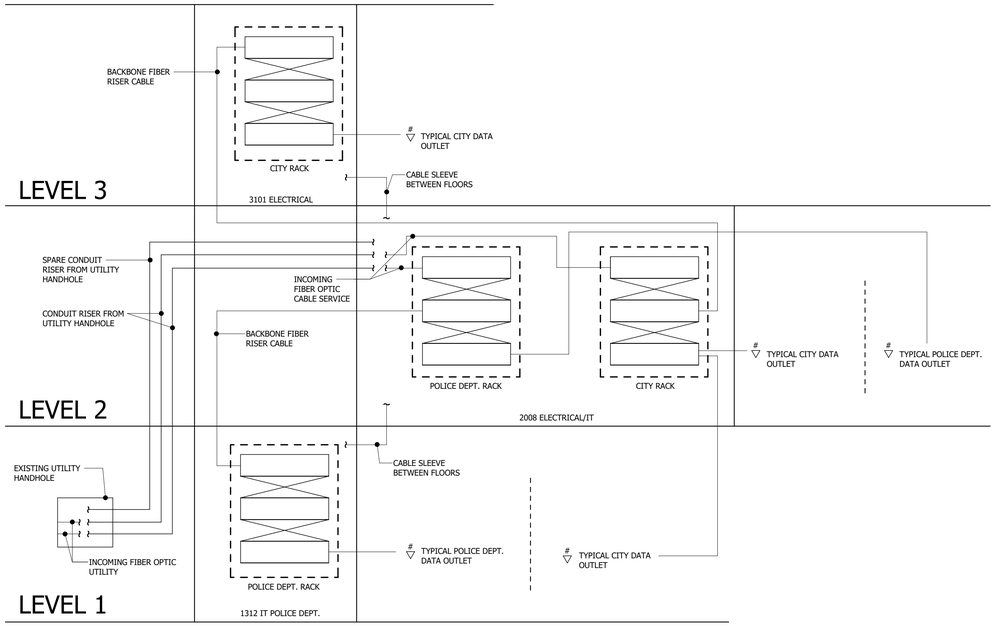
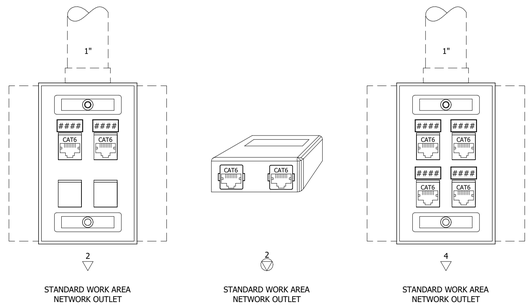


NOTES:

1. THIS RISER IS FOR DIAGRAMMATIC PURPOSES ONLY. ACTUAL ROUTING AND QUANTITIES ARE NOT SHOWN. REFER TO FLOOR PLANS FOR ADDITIONAL ROUTING INFORMATION.
2. REFER TO FLOOR PLANS FOR LOCATION AND QUANTITY OF CABLES AND JACKS.
3. REFER TO T4.01 IT CLOSET MAPPING FOR DATA CABLE ROUTING.

1 TECHNOLOGY RISER DIAGRAM
No Scale



NOTES:

A. MINIMUM CONDUIT SIZE FOR LOW VOLTAGE WIRING SHALL BE 1". REFER TO SPECIFICATIONS FOR DETAILS.

B. ALL STANDARD WORK AREA OUTLETS SHALL BE PROVIDED WITH TWO (2) CATEGORY 6 CABLES.

C. DETAILS ARE DRAWN BASED ON STUD TYPE CONSTRUCTION. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE (1) 4-11/16" BACKBOX FOR ALL LOW VOLTAGE OUTLETS WITH A SINGLE GANG OPENING. IF OUTLET IS LOCATED INSIDE A CONCRETE WALL, ELECTRICAL CONTRACTOR SHALL UTILIZE A SINGLE GANG DEEP MASONRY BOX FOR ROUGH-IN PURPOSES.

D. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE 4-PORT FACEPLATE AS SHOWN. PROVIDE BLANKS FOR ANY UNUSED OPENINGS. REFER TO SPECIFICATION 27 1005 FOR FURTHER DETAIL.

E. LOCATIONS SHOWING A QUANTITY OF "0" NETWORK DROPS SHALL BE ROUGH-IN FOR FUTURE USE. ELECTRICAL CONTRACTOR SHALL PROVIDE BLANK PLATE.

2 TELECOM DEVICE DETAIL CAT6
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

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CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST, WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: LOW VOLTAGE DETAILS

SHEET: T5.03

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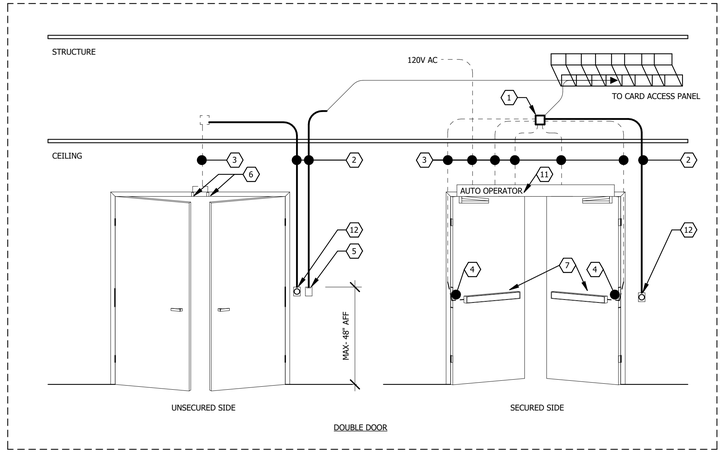
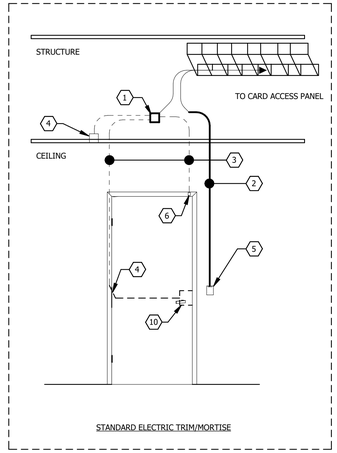
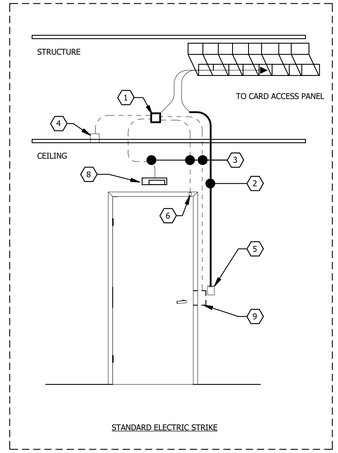


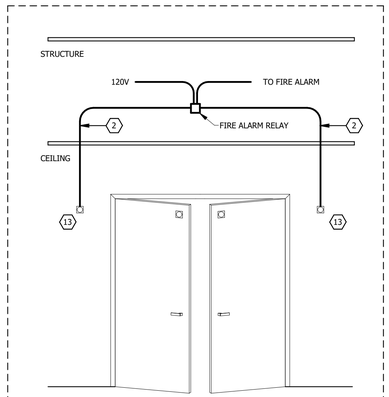
DOUBLE DOOR



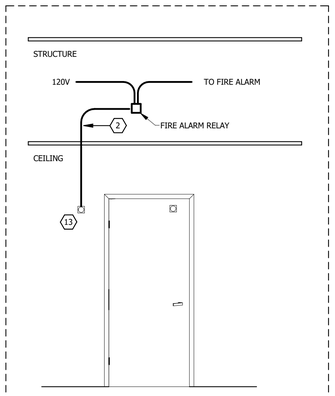
STANDARD ELECTRIC TRIM/MORTISE



STANDARD ELECTRIC STRIKE



STANDARD DOUBLE WITH HOLD OPENS



STANDARD SINGLE DOOR WITH HOLD OPENS

ACCESS CONTROL GENERAL NOTES:

A. DETAIL DRAWINGS ARE INTENDED TO REFLECT ACCEPTABLE INSTALLATION PRACTICES. INDIVIDUAL DOOR OPENINGS ARE NOT SHOWN AND WILL NEED TO BE COORDINATED WITH DIV 08 7100 SPECIFICATION. FINAL ROUGH IN DRAWINGS FOR INDIVIDUAL DOORS SHALL BE PROVIDED BY SECURITY CONTRACTOR.

B. COORDINATE FIRE ALARM DOOR RELEASE CONNECTIONS WITH FIRE ALARM CONTRACTOR.

C. COORDINATE EXACT LOCATIONS OF PUSH BUTTONS, CARD READERS, AND DURESS BUTTONS WITH OWNER.

ACCESS CONTROL REFERENCED NOTES:

1. 4 SQ JUNCTION BOX - PROVIDED BY ELECTRICAL CONTRACTOR IN ACCESSIBLE CEILING SPACE ON SECURE SIDE OF DOOR.
2. 3/4" CONDUIT RACEWAY WITH STRING - PROVIDED BY ELECTRICAL CONTRACTOR
3. 1/2" FLEX RACEWAY WITH STRING - PROVIDED BY ELECTRICAL CONTRACTOR
4. POWER TRANSFER HINGE - PROVIDED BY DOOR HARDWARE CONTRACTOR COORDINATE WITH DIVISION 08 CONTRACTOR ON FINAL LOCK CONNECTIONS WITH SYSTEMS BEING PROVIDED.
5. CARD READER - PROVIDED BY SECURITY CONTRACTOR
6. DOOR POSITION SWITCH - COORDINATE LOCATION WITH DOOR HARDWARE CONTRACTOR
7. ELECTRIFIED EXIT LOCK HARDWARE - PROVIDED BY DOOR HARDWARE CONTRACTOR
8. MOTION REQUEST TO EXIT - PROVIDED BY SECURITY CONTRACTOR
9. ELECTRIFIED STRIKE - PROVIDED BY DOOR HARDWARE CONTRACTOR
10. MORTISE LOCK - PROVIDED BY DOOR HARDWARE CONTRACTOR
11. DOOR AUTO OPERATOR - PROVIDED BY DOOR HARDWARE CONTRACTOR
12. ADA ACTUATOR - PROVIDED BY DOOR HARDWARE CONTRACTOR
13. FIRE ALARM ELECTRIFIED MAGNETIC DOOR HOLD - PROVIDED BY DOOR HARDWARE CONTRACTOR

1 ACCESS CONTROL DETAIL
No Scale

MATRIX OF RESPONSIBILITIES FOR DOOR HARDWARE

ELECTRICAL CONTRACTOR (SPECIFICATION SECTION 26)

ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL OF THE FOLLOWING ITEMS AS IT RELATES TO THE ACCESS CONTROL SYSTEM AND DOOR HARDWARE COMPONENTS:

- CONDUIT PATHWAYS, SLEEVES AND PENETRATIONS FROM ACCESS CONTROL HEAD END LOCATION TO EACH DOOR'S RESPECTIVE JUNCTION BOX. TREAT EACH THROUGH PENETRATION AS A ONE HOUR RATED WALL AND PROVIDE APPROPRIATE FIRE STOPPING REQUIRED.
- ALL CONDUIT PATHWAYS FROM EACH RESPECTIVE DOOR'S JUNCTION BOX OR ACCESS CONTROL ENCLOSURE TO THE FRAME OF THE DOOR FOR EACH REQUIRED DEVICE.
- ALL CONDUIT PATHWAYS AS IT IS REQUIRED FOR THE AUTOMATIC DOOR OPERATORS AND ACTUATORS.
- ALL REQUIRED ROUGH-IN AND JUNCTION BOXES FOR ACCESS CONTROL SYSTEM'S PROXIMITY CARD READERS, AUTOMATIC DOOR OPENER ACTUATORS, AUXILIARY ALARM DEVICES AND J-BOX WIRING POINTS AS SHOWN IN THE DETAILS.
- ALL 110VAC CIRCUITS FOR ACCESS CONTROL POWER SUPPLIES, AUTOMATIC DOOR OPERATORS AND ANY CENTRALIZED POWER SUPPLIES AT THE ACCESS CONTROL HEAD END. COORDINATE WITH INSTALLING CONTRACTORS FOR THE ACCESS CONTROL SYSTEM, AUTOMATIC DOOR OPERATORS AND DOOR HARDWARE PROVIDERS ON SPECIFIC NEEDS. REFER TO POWER PLANS FOR CIRCUITING INFORMATION.
- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PULLING THE HARDWARE CABLING THROUGH THE FRAME AND SHALL EITHER COORDINATE WITH THE HARDWARE INSTALLER OR THEIR ACCESS CONTROL SUB TO ENSURE THAT THIS GETS DONE APPROPRIATELY DURING ROUGH-IN AND FRAME INSTALLATION AND/OR RETROFITTING OF EXISTING DOORS.

DOOR HARDWARE CONTRACTOR (SPECIFICATION SECTION 08 7100)

DOOR HARDWARE CONTRACTOR SHALL PROVIDE AND INSTALL ALL OF THE FOLLOWING ITEMS AS IT RELATES TO THE ACCESS CONTROL SYSTEM AND DOOR HARDWARE COMPONENTS:

- ALL ELECTRIFIED LOCKSETS, STRIKES, PANIC BARS AND INTEGRATED PROXIMITY READER/MAGSTRIPE LOCKSETS SHALL BE PROVIDED AND INSTALLED BY DOOR HARDWARE CONTRACTOR.
- ADA OPERATORS SHALL BE PROVIDED BY DOOR HARDWARE CONTRACTOR AND INSTALLED ONLY BY A CERTIFIED AUTO OPERATOR INSTALLER. FINAL POWER CONNECTION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
- COORDINATE ALL POWER REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.
- ALL OTHER MECHANICAL AND NON-ELECTRIFIED DOOR HARDWARE COMPONENTS INCLUDING BUT NOT LIMITED TO, LOCKSETS, CYLINDERS, HINGES, KICKPLATES, SEALS, WALL STOPS, GASKETS, CLOSERS AND PUSHPLATES SHALL ALL BE PROVIDED AND INSTALLED BY THE DOOR HARDWARE CONTRACTOR.
- DOOR HARDWARE SUPPLIER SHALL SUPPLY ALL APPROPRIATE POWER SUPPLIES NEEDED TO CONTROL AND HANDLE THE APPROPRIATE POWER REQUIREMENTS OF THE ELECTRIFIED HARDWARE THEY ARE PROVIDING.
- COORDINATE ALL INTEGRAL ACCESS CONTROL DEVICES SUCH AS INTEGRAL CARD READERS WITH THE ACCESS CONTROL CONTRACTORS FOR SEAMLESS INTEGRATION.

ACCESS CONTROL CONTRACTOR

ACCESS CONTROL CONTRACTOR SHALL PROVIDE AND INSTALL ALL OF THE FOLLOWING ITEMS AS IT RELATES TO THE ACCESS CONTROL SYSTEM AND DOOR HARDWARE COMPONENTS:

- **THIS CONTRACTOR SHALL AT BID TIME, COORDINATE ALL COMPONENTS/DEVICES AS SPECIFIED IN 08 7100. LOOK FOR DOOR POSITION SWITCHES, INTEGRAL AND SPECIAL CARD READERS, AND POWER SUPPLY DISCREPANCIES THAT MAY EFFECT COUNTS OR BID. ALL CONCERNS SHALL BE BROUGHT TO ENGINEER FOR CLARIFICATION DURING ADDENDA PHASE.**
- COORDINATE FRAME PREP REQUIREMENTS WITH DOOR FRAME CONTRACTOR. ACCESS CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PULLING AND TERMINATION OF ALL LOW VOLTAGE CONNECTIONS TO THE CARD ACCESS SYSTEM FOR OPERATION.
- MOTION DETECTORS SHALL BE INSTALLED WHERE NOTED TO SHUNT ALARMS ON THE ACCESS SYSTEM WHILE ALLOWING EGRESS.
- STANDALONE PROXIMITY READERS SHALL BE INSTALLED AT LOCATIONS IDENTIFIED ON THE FLOOR PLANS.
- ALL HEAD END SERVERS, ENCLOSURES, CONTROLLERS, READERS, INPUT/OUTPUT BOARDS AND LOCAL POWER SUPPLIES REQUIRED TO CREATE A FULLY FUNCTIONAL ACCESS CONTROL SYSTEM.
- ACCESS CONTROL CABLING AND TERMINATIONS FOR ALL ACCESS CONTROL RELATED DOOR HARDWARE COMPONENTS AT BOTH THE HEAD END LOCATION AND AT EACH DOOR LOCATION. DATA CABLE AND POWER OVER ETHERNET SWITCH SHALL BE OWNER PROVIDED.
- SOFTWARE PROGRAMMING FOR EACH INDIVIDUAL OPENING. COORDINATE ALL LOCK/UNLOCK DOOR SCHEDULES AND DOOR LABELING SCHEME WITH OWNER PRIOR TO PROGRAMMING.
- ACCESS CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE ELECTRICAL CONTRACTOR AND AUTOMATIC OPERATOR CONTRACTOR WITH LOCATIONS HAVING BOTH AUTOMATIC DOOR OPERATORS AND ACCESS CONTROL.
- ACCESS CONTROL CONTRACTOR SHALL PROVIDE FREE EGRESS FUNCTIONALITY. UPON PRESSING THE INTERIOR ACTUATOR, THE DOOR SHALL BOTH SIMULTANEOUSLY UNLOCK AND OPEN. PROVIDE ALL WIRING AND RELAY INTERFACES WITH THE DOOR OPERATOR TO CREATE THIS FUNCTIONALITY.
- ACCESS CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATING EACH OPENING'S NEED FOR FUNCTIONALITY DURING THE EVENT OF A FIRE. COORDINATE SPECIFIC CABLE DROP AND/OR FIRE ALARM RELAY NEEDS WITH FIRE ALARM CONTRACTOR.
- FINAL PERFORMANCE TESTING OF EACH LOCATION SHALL BE PROVIDED BY THE ACCESS CONTROL CONTRACTOR.
- INTEGRATE WITH ALL AUXILIARY INPUTS AND OUTSIDE SYSTEM INFLUENCES SUCH AS, BUT NOT LIMITED TO, VIDEO SURVEILLANCE, AUXILIARY LOCK DOWN OR DOOR RELEASE BUTTONS, FIRE ALARM, BURGLAR SYSTEMS, ETC.

ADDITIONAL SPECIFICATION SECTION 27 ITEMS

SECTION 27 CONTRACTOR SHALL PROVIDE AND INSTALL ALL OF THE FOLLOWING ITEMS AS IT RELATES TO THE ACCESS CONTROL SYSTEM AND DOOR HARDWARE COMPONENTS:

- ALL CATEGORY 6 CABLING TO A WORK AREA OUTLET FOR EACH COORDINATED ACCESS CONTROL PANEL LOCATION.
- FINAL PATCH CORD TO EQUIPMENT.

ADDITIONAL OWNER ITEMS

OWNER SHALL PROVIDE AND INSTALL ALL OF THE FOLLOWING ITEMS AS IT RELATES TO THE ACCESS CONTROL SYSTEM AND DOOR HARDWARE COMPONENTS:

- POWER OVER ETHERNET SWITCHES FOR THE ACCESS CONTROL PANELS AND ELECTRIC STRIKES.
- IP ADDRESS SCHEME FOR ALL IP DEVICES. ACCESS CONTROL CONTRACTOR SHALL COORDINATE CLOSELY WITH THE OWNER FOR THIS INFORMATION.

2 MATRIX OF RESPONSIBILITY FOR ACCESS CONTROL
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:

DATE	NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST,
WATERLOO, IA

PROJECT NO: 24102

DATE: 8/26/2026

SHEET SET: BID DOCUMENTS

SHEET NAME: LOW VOLTAGE DETAILS

SHEET: T5.04

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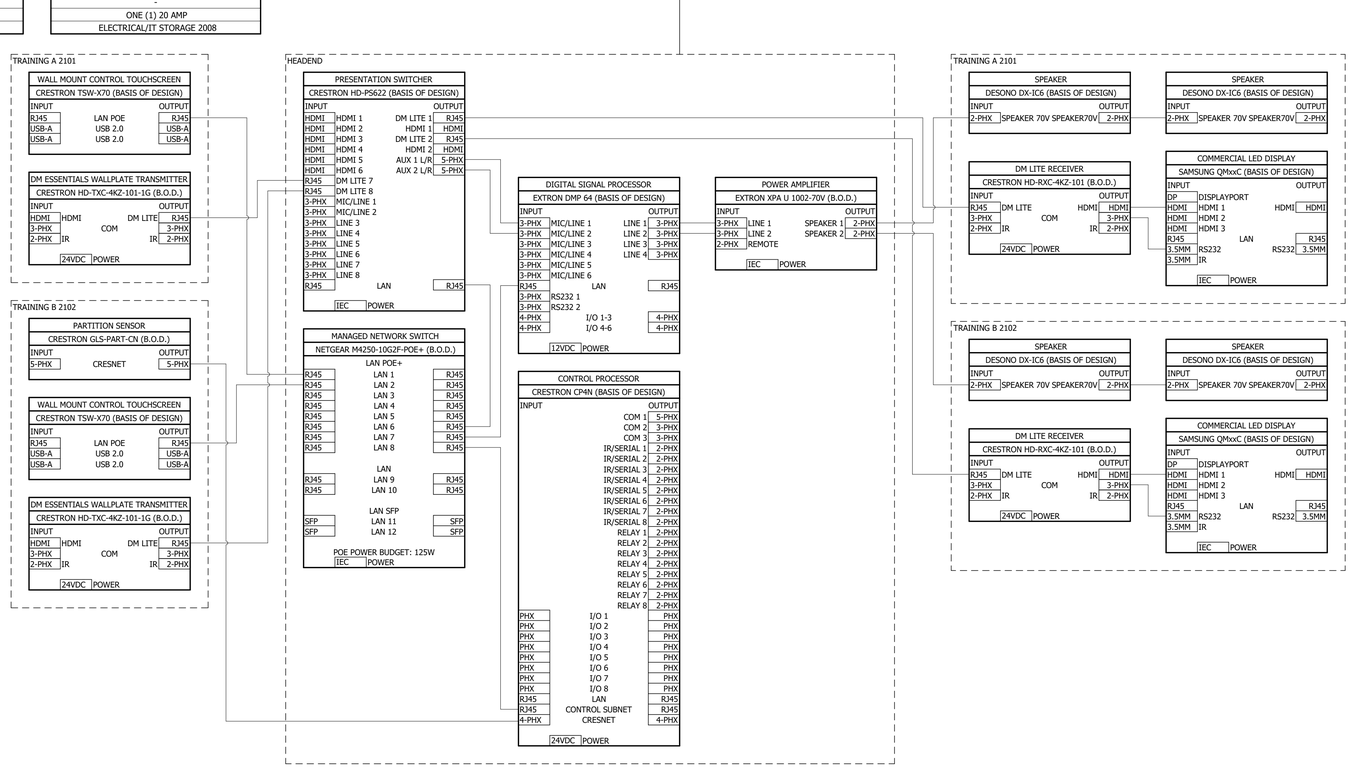
AV EQUIPMENT SCHEDULE

DEVICE	MANUFACTURER	SYMBOL	MODEL	DESCRIPTION	EQUALS
ADD ALTERNATE - TRAINING A 2101 / TRAINING B 2102					
DISPLAYS AND MOUNTS					
85" DISPLAY	SAMSUNG	LED1	QM85C	85" COMMERCIAL GRADE 4K DISPLAY	LG, PANASONIC, SHARP/NEC
75" DISPLAY	SAMSUNG	LED2	QM75C	75" COMMERCIAL GRADE 4K DISPLAY	LG, PANASONIC, SHARP/NEC
WALL MOUNT	CHIEF	MNT1	LTM1U	LARGE UNIVERSAL TILT WALL MOUNT	PEERLESS
AUDIO DSP, AMPLIFIERS, AND SPEAKERS					
AUDIO DSP	EXTRON		DMP 64	6X4 FIXED I/O DSP	BOSE, BIAMP, QSC
AMPLIFIER	EXTRON		XPA U 1002-70V	2X100W@70V POWER AMPLIFIER	BOSE, JBL, QSC
CEILING SPEAKERS	BIAMP	SP1	DESONO DX-IC6	6.5" CEILING LOUDSPEAKER	BOSE, JBL, QSC
SUMMING TRANSFORMER	RDL		TX-J2	UNBALANCED STEREO TO BALANCED MONO TRANSFORMER	EXTRON
VIDEO COMPONENTS					
WALLPLATE TRANSMITTER	CRESTRON	TX2	HD-TXC-4KZ-101-1G	DM ESSENTIALS WALLPLATE TRANSMITTER FOR HDMI	EXTRON
SWITCHER	CRESTRON		HD-PS622	PRESENTATION MATRIX SWITCHER	EXTRON
RECEIVER	CRESTRON		HD-RXC-4KZ-101	DM ESSENTIALS RECEIVER FOR HDMI	EXTRON
CONTROL COMPONENTS					
7" TOUCHSCREEN	CRESTRON	TS1	TSW-770	7" WALL MOUNTED CONTROL TOUCHSCREEN	EXTRON
PARTITION SENSOR	CRESTRON	PTS	GLS-PART-CN	CRESNET PARTITION SENSOR	EXTRON
CONTROL PROCESSOR	CRESTRON		CP4N	4-SERIES CONTROL PROCESSOR W/AV SUBNET	EXTRON
NETWORKING COMPONENTS					
SWITCH	NETGEAR		M4250-10G2F-POE+	10-PORT GIGABIT MANAGED NETWORK SWITCH W/POE+	LUXUL
PATCH PANEL	TRIPP-LITE		N062-012-KJ	12-PORT MODULAR PATCH PANEL	271005
RACKS AND ACCESSORIES					
AV RACK	MIDDLE ATLANTIC	AVR1	DWR-16-22	16RU 22" DEEP WALL MOUNTED RACK	LOWELL
DOOR	MIDDLE ATLANTIC		LVFD-16	16RU VENTED FRONT DOOR	LOWELL
RACK POWER	MIDDLE ATLANTIC		PDX-920R-SP	RACKMOUNT POWER STRIP W/SERIES SURGE PROTECTION	SURGEX
LACING BARS	MIDDLE ATLANTIC		LBP SERIES	HORIZONTAL LACING BAR - OFFSETS AS REQUIRED	LOWELL
LACE STRIPS	MIDDLE ATLANTIC		LACE-OWP SERIES	VERTICAL LACING STRIP - LENGTH AS REQUIRED	LOWELL
RACK BLANKS	MIDDLE ATLANTIC		BL1	ANODIZED PANEL FOR ALL UNUSED OPENINGS	LOWELL
SHELVING	MIDDLE ATLANTIC		UMS1-11.5	UNIVERSAL MOUNTING SHELF	LOWELL
BRUSH PANEL	MIDDLE ATLANTIC		BR1	1RU BRUSH GROMMET PANEL	LOWELL
SYSTEM CABLING					
SPEAKER CABLE	BELDEN		6200UE	16AWG 2-CONDUCTOR	LIBERTY, WEST PENN, WINDY CITY
CAT6	BELDEN		2413	23AWG 4-PAIR CATEGORY 6 U/UTP	LIBERTY, WEST PENN, WINDY CITY
DIGITALMEDIA CABLE	CRESTRON		DM-CBL-ULTRA-P	DIGITALMEDIA ULTRA CABLE (S/FTP)	EXTRON
CRESNET CABLE	CRESTRON		CRESNET-P	CRESNET CONTROL CABLE	EXTRON
HDMI CABLE	CRESTRON		CBL-HD-8K SERIES	HDMI PATCH CABLE (LENGTHS AS REQUIRED)	EXTRON

1	MIDDLE ATLANTIC PDX-920R-SP
2	BLANK
3	BLANK
4	BLANK
5	BLANK
6	PATCH PANEL
7	MIDDLE ATLANTIC BR1
8	NETGEAR M4250-10G2F-POE+
9	BLANK
10	EXTRON DMP / EXTRON XPA
11	BLANK
12	CRESTRON CP4N
13	BLANK
14	BLANK
15	BLANK
16	CRESTRON HD-PS622

MANUFACTURER	MIDDLE ATLANTIC
MODEL	DWR-16-22
HEIGHT (RU)	35.06" (16 RU)
WIDTH	23.4"
DEPTH	22"
TYPE	CABINET
MOUNTING	WALL
DOOR STYLE	VENTED
CABLE MANAGEMENT	HORIZONTAL AND VERTICAL
POWER DISTRIBUTION	HORIZONTAL
VENTILATION	-
POWER CIRCUITS	ONE (1) 20 AMP
LOCATION	ELECTRICAL/IT STORAGE 2008



1 AV RISER - WATERLOO CITY HALL TRAINING - ALTERNATE
No Scale

NOTE:
VERIFY BUILDING DIMENSIONS FOR ROUGH-IN WORK WITH ARCHITECT'S DRAWINGS.

24-187 - CITY HALL RELOCATION

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Waterloo, IA 50701
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CONSULTANT:
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MODUS ENGINEERING

STRUCTURAL
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REVISIONS:

Description	Date	No.

OWNER SIGN-OFF:
DATE NAME

CITY OF WATERLOO
NEW CITY HALL / POLICE HEADQUARTERS
100 E 4TH ST.
WATERLOO, IA

PROJECT NO:
24102

DATE:
8/26/2026

SHEET SET:
BID DOCUMENTS

SHEET NAME:
LOW VOLTAGE ALTERNATE DETAILS

SHEET:
T5.05

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COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Steven Kjergaard, Director of Aviation
Airport Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Motion approving Change Order No. 1 with GEMS Technical Services, Inc., of Orange, California, to add thirty calendar days to contract completion due to manufacturer delays, with no change to the contract price, in conjunction with the Replace Passenger Boarding Bridge, FAA AIP Project No. 3-19-0094-057-2025, and authorizing the Mayor and City Clerk to execute said document.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. GEMS Tech Services - Change Order No 1 - FAA AIP 3-19-0094-057-2026 (R1) (002)

CHANGE ORDER NO. 1

Owner: **Waterloo Regional Airport, Waterloo, Iowa** Date: **August 21, 2026**

Project: **Passenger Boarding Bridge**

Owner's Contract No. **FAA AIP Project No. 3-19-0094-057-2025**

Contractor: **GEMS Technical Services, Inc.**

Date of Contract Start: **September 15, 2025**

You are directed to make the following changes in the Contract Documents. Description:

Item No.	Description	Unit	Unit Price	Quantity	Amount
				Total Change Order	$ 0.00

Reason for Change Order:

Added calendar days to contract completion. Fabrication of the boarding bridge has been delayed due to material delivery and overall production backlog by the boarding bridge manufacturer.

CONTRACT PRICE		CONTRACT TIMES (Calendar Days)	To substantial completion	To final completion
Original:	$ 1,917,228.00	Original:		420
Previous C.O.s (ADD):	$ 0.00	Previous C.O.s (ADD):		0
This C.O. (DEDUCT):	$ (0.00)	This C.O. (ADD):		30
Contract Price with all approved Change Orders:	$ 1,917,228.00	REVISED:		450

It is agreed by the Contractor that this Change Order includes any and all costs associated with or resulting from the change(s) ordered herein, including all impact, delays, and acceleration costs. Other than the dollar amount and time allowance listed above, there shall be no further time or dollar compensation as a result of this Change Order.

THIS DOCUMENT SHALL BECOME AN AMENDMENT TO THE CONTRACT AND ALL STIPULATIONS AND COVENANTS OF THE CONTRACT SHALL APPLY HERETO.

RECOMMENDED:

By: _____ August 21, 2026
Engineer (Authorized Signature) Date

APPROVED:

By: _____ _____
Owner (Authorized Signature) Date

ACCEPTED:

By: April Barry August 21, 2026
Contractor (Authorized Signature) Date

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Human Resources Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Motion to approve the hiring of **Carson Jordan** from the current Civil Service List to the position of Operations Specialist at the Young Arena, effective September 9, 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. YOUNG ARENA OPERATIONS SPECIALIST 5.2026
2. YA Operations Specialist (exp 7.27)

PERSONNEL REQUISITION FORM

Check as applicable: ☒ To start recruiting or civil service process and/or ☒ To fill a vacancy
☐ Active Civil Service List Expires:

A proposed job description and questionnaire must accompany this form at time of submission to Human Resources.

****

Position Title: Young Arena Operations Specialist Department: Leisure Services

Reports To: Assistant Young Arena Manager Work Location: Young Arena

Employment Status:
☒ Regular Full Time ☐ Temporary Full Time from ____ to ____
☐ Regular Part Time ☐ Temporary Part Time from ____ to ____
☐ Regular 7-Month ☐ Intern/Co-op Student from ____ to ____

Type of Position:
Civil Service Position: ☒ Yes ☐ No
Bargaining Position: ☐ Yes ☒ No
Bargaining Group: N/A
Non-bargaining Position: ☒ Yes ☐ No

Recommended Recruitment Sources:
☐ Internal Posting Only
☒ Internal Posting and External Advertising

****

Complete the following if the requisition is to fill a vacancy:

☐ New Position or ☒ Replacement Position for: Jake Schaefer
(Specify name and title of former incumbent)

If replacement, former incumbent: ☐ Retired/Resigned/Terminated ☐ Transferred ☒ Promoted

Date incumbent terminated employment: N/A Date of final payout: N/A

Anticipated start date: 6/16/26 No. of hours/week: 40 Work schedule: M-F 8:00am-5:00pm and nights & weekends

Justification of need for position: This is an essential administrative position at Young Arena. The Young Arena Specialist coordinates many aspects of Young Arena operations and is specifically in charge of all ice resurfacing activities, facility maintenance including ice plant and HVAC units.

What are the likely consequences if the position is not filled? Young Arena operations will struggle. The other two full time staff will become burnt out trying to do this job in addition to their own. Ultimately event organizers may choose to hold their events elsewhere and revenue generation and customer satisfaction will suffer.

APPROVALS

Annual salary requirements: $67,100.80 Hourly Rate: $32.26 Benefits: $50.70 hourly/ $105,463.14 annually
(Payroll taxes, pension, health ins.- assuming family)

Is position budgeted for this and future FYs? ☒ Yes ☐ No If no, how will position be funded? ____

Approved subject to the following conditions: ____

5/11/26
Submitting Department Head Date

Mayor Date

Chief Financial Officer Date

Human Resources Director Date

Human Resources Committee Chairperson Date

Created 6/30/2017

PERSONNEL REQUISITION
Young Arena Specialist

The following questions are provided as guidelines to assist you in developing your rational for the position of Young Arena Specialist in the Leisure Services Department. Depending upon your situation, some questions may or may not apply. Please provide written responses to these questions as part of your preparation for meeting with the Mayor.

(1) What are the key job responsibilities of this position?

The Young Arena Specialist is a position under the general direction of the Assistant Young Arena Manager, responsible for assisting with coordination of all administrative, operational, concession, financial, facility maintenance, and marketing activities at Young Arena. Additionally, the Young Arena Specialist is the point person within the organization regarding the Zamboni Ice Resurfacers with regards to operation, staff training, and maintenance of these machines.

(2) Can the job responsibilities of this position be assigned to other employees within the department? If no, why not?

No. All other employees are being used to their fullest potential.

(3) How is the work of this position being accomplished now?

Jake Schaefer is attempting to complete this work in addition to filling the role of Interim Assistant Arena Manager. This is not a sustainable model.

(4) Are the filled positions in your department currently being utilized to their maximum potential?

Absolutely.

(5) How would filling this position meet the needs of your department or the City on either a short-term basis (if temporary position) or a long-term basis (if a regular position)?

Young Arena hosts thousands of visitors each year and dozens of major events. Having quality staffing of the operation is key to the success of these events. The Young Arena Specialist fills in for and assists The Young Arena Assistant Manager and Manager in any capacity needed.

(6) What cost savings or revenues, if any, would your department or the City realize if this position is filled?

The Young Arena Specialist is a critical piece of the puzzle to make sure events go off without a hitch. They are a utility position handling many tasks. Without this key position events will have glitches, the facility will not be as well maintained, and ultimately events will choose other facilities to host their needs. When that happens revenue generation at the arena would most certainly suffer driving operational cost to the taxpayer up.

(7) If you are paying overtime or comp time within your department to accomplish this work now, how much overtime or comp time has been paid out or earned that is directly attributable to this position and over what period of time?

We are fortunate as to the timing of this vacancy. Currently comp or overtime is being kept to a minimum but if this vacancy drags out into the hockey season significant comp will be needed by other staff. Not only is that expensive and not sustainable but it will burn out the Arena Manager and Assistant Arena Manager.

(8) How has the work load or demands of your department changed in comparison to your staffing levels over the past three fiscal years? Provide statistics if possible.

Young Arena is probably the busiest it has ever been in its 31year history. Through that time full time staffing has remained consistent at three individuals.

(9) If this position is not filled, what affect will it have on your department? What work will not get done? What costs will you incur? Please be as specific as possible.

Operations across the board at Young Arena will suffer ultimately harming revenue generation abilities. The other two staff members will quickly get burnt out handling an additional 33% more of the workload between the two of them.

(10) How do you cover the responsibilities for this position whenever the incumbent is out on vacation?

Other staff do the best they can to fill in for short periods of time however that is not a sustainable model long term.

(11) Is it possible that the City could outsource this position to an outside agency? If so, what savings, if any, would the City realize as a result of this change?

No. City staff is needed to best operate a City owned facility.

(12) How would you rank this position in terms of its contribution to City business in comparison with other positions reporting to you?

This position is equally as important to all other full time positions that report to me.

(13) How does this position impact the Goals and Objectives for the City adopted by the City Council?

The City of Waterloo's 2030 Community Vision or Strategic Plan is based on eight pillars. Pillar #7 of that plan is Sportstown USA. The Sportstown USA pillar states that Waterloo should be the most rec-friendly and sports-focused town in Iowa. Having a premier ice arena with numerous opportunities for competitive hockey, figure skating, youth wrestling, public skating and walking certainly bolsters Waterloo's position as Sportstown USA.

Note: Forward completed questionnaire to Human Resources Department with original copy of Personnel Requisition form.

CITY OF WATERLOO IOWA
Community of Opportunity

CIVIL SERVICE NOTICE
CITY OF WATERLOO, IOWA
OPEN EXAMINATION

YOUNG ARENA OPERATIONS SPECIALIST

DEPARTMENT	**LEISURE SERVICES**
SALARY	**$67,100.80 - $92,872.00**
FLSA	**NON-EXEMPT**
CIVIL SERVICE	**INCLUDED**
BARGAINING UNIT	**NON-BARGAINING**

GENERAL STATEMENT OF DUTIES

This position is under the general direction of the Assistant Young Arena Manager, assisting other staff with coordination of administrative, operational, concession, financial, facility maintenance, and marketing activities at Young Arena. Will often work independently and with minimum supervision. Supervises temporary, and seasonal employees.

EXAMPLES OF ESSENTIAL FUNCTIONS (Illustrative only)

These functions are considered essential for successful performance in this job classification.

1. Works with the Assistant Arena Manager and Manager to schedule custodial and maintenance staff and ensure adequate staffing is available for all events.
2. Responds to questions from the public concerning Young Arena.
3. Directs the work activities of temporary and seasonal employees as assigned.
4. Skilled in operation and maintenance of Zamboni Ice Resurfacers.
5. Prepares banking deposits and slips.
6. Prepares written records and reports.
7. Works with online payroll software to ensure Young Arena staff is paid appropriately.
8. Works independently and with others with minimum supervision.
9. Attends work regularly at the designated place and time. Will be assigned to evening and weekend work.
10. Coordinates and performs specialized facility maintenance including ice plant operations and HVAC equipment.
11. Operates forklift as needed.
12. Performs all work duties and activities in accordance with City policies, procedures, and OSHA, City and Leisure Services safety rules and regulations.
13. Performs all other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS, AND ABILITIES

1. Ability to instruct, train and supervise all Young Arena employees.
2. Ability to express ideas orally and in writing.
3. Ability to understand chemical hazard labels and keep chemical application records.
4. Ability to exercise independent judgment in completion of assigned projects.
5. Ability to respond to questions and comments from the public tactfully and politely.
6. Ability to communicate effectively and maintain working relationships with coworkers, supervisors, elected officials and the public.
7. Ability to work with people from a broad variety of social, economic, racial, ethnic and educational backgrounds.

ACCEPTABLE EXPERIENCE & TRAINING

1. Bachelor's degree in related field with minimum 1 year of experience working in ice arena industry.
   OR
   Associate's degree with minimum of 2 years of experience working in ice arena industry.
   OR
   High School Graduate/G.E.D. with minimum of four years of experience working in ice arena industry.
   OR
   High School Graduate/G.E.D with any equivalent combination of education and experience that provides the knowledge, skills and abilities necessary to perform the essential functions of the position.
2. Iowa Class C Driver's License and good driving record based on City of Waterloo driver performance criteria. A candidate with any of the following will not be considered for employment: loss of license for any reason during the period of candidacy for employment, if the candidate remains without a valid, current license for the position when the City issues an offer of employment; loss of license, plea of guilty, plea of no contest or its equivalent or conviction for OWI, reckless driving or other major moving violation include habitual violator within the previous five years; four or more citations for moving violations within the previous three-year period, excluding speeding violations of 10 mph or less over the posted speed limit; three or more citations for moving violations within the previous one-year period. After appointment to the position, disciplinary action or continuing employment status may be reviewed for the following: four or more moving violations within the previous three years, three or more moving violations within the previous one year or loss of license or conviction for OWI, reckless driving or other major moving violation including habitual violator within the previous five years; two or more at-fault accidents within a three-year period while driving on City business; three or more at-fault accidents within a three-year period. An applicant's driving record will be reviewed prior to an offer of employment and at least annually after hire.

ESSENTIAL PHYSICAL ABILITIES

The following physical abilities are required with or without accommodation.

1. Sufficient strength and flexibility to perform assigned tasks.
2. Sufficient speech and hearing that permits the employee to communicate effectively with coworkers and the public.
3. Sufficient depth perception, distance and peripheral vision to safely operate City vehicles, forklifts, etc. and equipment.

4. Sufficient hearing to understand verbal instructions, respond to questions from the public and diagnose equipment malfunctions.
5. Sufficient personal mobility that permits the employee to move around Young Arena.

MISCELLANEOUS

1. Must submit to City hiring requirements including pre-employment, post-accident, reasonable suspicion, and return-to-duty/follow-up alcohol and drug testing.
2. Following a conditional offer of employment, the City of Waterloo requires a physical examination and a drug test by a physician of the City's choice to determine if an applicant is capable of performing the essential functions of the position. Failure to pass the physical and drug test will result in withdrawal of the employment offer.
3. The City of Waterloo reserves the right to conduct a background investigation including driving, employment and education on any applicant being considered for this position. After a conditional offer of employment is made a criminal history record search may also be completed.
4. Must submit to and pass Civil Service examination procedures including a panel interview.

WORK SCHEDULE

Required to work evenings, weekends and Holidays. Work schedule is based on an 8-hour day/40-hour week. Actual shift start time and days worked may vary depending on event schedule and season. One-hour unpaid lunch break. Minimal overtime.

EXAMINATION INFORMATION

All qualified candidates who apply by the deadline date will be required to appear before an interview panel consisting of a minimum of three people who have expertise in the areas being tested. An individual must receive a minimum average score of sixty points out of one hundred to achieve a passing score on the interview. The top applicants, as ranked by their scores on the interview, will be the individuals placed on the certified list. Applicants who qualify as outlined and are full-time regular employees of the City of Waterloo shall have one additional point per full year of employment up to a maximum of five points added to their final score. Honorably discharged men and women from the armed forces of the United States who qualify per provisions of Chapter 35 of the Code of Iowa and who are citizens and residents of the United States shall have five additional points added to their final score upon submission of their DD214 or ten points added if they were awarded a Purple Heart or have a service-connected disability.

ORAL **EXAMINATION DATE**

All qualified candidates who apply by the deadline date will be notified of the time, place and date of the oral examination.

YOUNG ARENA OPERATIONS SPECIALIST 2026

A.A./E.E.O.

Minority, female & disabled individuals are encouraged to apply.

715 Mulberry St, Waterloo, IA 50703
Phone: (319) 291-4303
Fax: (319) 291-4569
CITYOFWATERLOOIOWA.COM

July 31, 2026

TO: Honorable Mayor & City Council

We, the members of the Civil Service Commission, certify the following list of applicants, who are eligible based upon the examination process as set forth by the Civil Service Commission for the appointment to the position of Young Arena Operations Specialist for the City of Waterloo, Iowa Leisure Services. This list shall be used to fill any vacancy in the Young Arena Operations Specialist classification from July 31, 2026 – July 31, 2027.

CERTIFIED LIST

Craig Denner
Carson Jordan
Kelsi Peters
Michael Relaz
Parker Johnson

Respectfully submitted,

Sara Varda Date

Dr. Robert Welch Date

Marianne Kurtenbach Date

*January 6, 2025 the Waterloo City Council voted to suspend the Civil Service hiring practices for entrance positions as allowed by the Iowa Administrative Code section 400.12A until January 6, 2027; therefore no signatures are required to certify this list.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Human Resources Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Motion to approve the hiring of **Derek White** from the current Civil Service List to the position of Chief Mechanical Inspector in Building Inspections, effective after September 8, 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Chief Mechanical Inspector (exp 8.28)
2. CHIEF_MECHANICAL_INSPECTOR_6.2026[1]

Docusign Envelope ID: 91D57AB6-D697-8092-83C9-8AB46EEBB964

715 Mulberry St, Waterloo, IA 50703
Phone: (319) 291-4303
Fax: (319) 291-4569
CITYOFWATERLOOIOWA.COM

August 21st, 2026

TO: Honorable Mayor & City Council

We, the members of the Civil Service Commission, certify the following list of applicants, who are eligible based upon the examination process as set forth by the Civil Service Commission for the appointment to the position of Chief Mechanical Inspector for the City of Waterloo, Building Inspections. This list shall be used to fill any vacancy in the Chief Mechanical Inspector classification from August 21st, 2026 – August 21st, 2027.

CERTIFIED LIST

Ryan McKinney
Scot Reuter
Derek White

Respectfully submitted,

DocuSigned by:
Sara Varda
5758D92A74C1466...
Sara Varda

8/24/2026
Date

Signed by:
Marianne Kurtenbach
D35A1864B308445...
Marianne Kurtenbach

8/21/2026
Date

Docusign Envelope ID: B003E5D1-9ECE-87A3-83F3-11C8480709A0

PERSONNEL REQUISITION FORM

Check as applicable: ☒ To start recruiting or civil service process and/or ☒ To fill a vacancy
☐ Active Civil Service List Expires: _____

A proposed job description and questionnaire must accompany this form at time of submission to Human Resources.

****

Position Title: CHIEF MECHANICAL INSPECTOR Department: BUILDING INSPECTIONS

Reports To: BUILDING OFFICAL Work Location: CITY HALL

Employment Status:
☒ Regular Full Time ☐ Temporary Full Time from _____ to _____
☐ Regular Part Time ☐ Temporary Part Time from _____ to _____
☐ Regular 7-Month ☐ Intern/Co-op Student from _____ to _____

Type of Position:
Civil Service Position: ☒ Yes ☐ No
Bargaining Position: ☒ Yes ☐ No
Bargaining Group: 177
Non-bargaining Position: ☐ Yes ☒ No

Recommended Recruitment Sources:
☐ Internal Posting Only
☒ Internal Posting and External Advertising

****

Complete the following if the requisition is to fill a vacancy:

☐ New Position or ☒ Replacement Position for: BRIAN BAKER CHIEF MECHANICAL INSPECTOR
(Specify name and title of former incumbent)

If replacement, former incumbent: ☒ Retired/Resigned/Terminated ☐ Transferred ☐ Promoted

Date incumbent terminated employment: 10/9/2026 Date of final payout: 10/30/2026

Anticipated start date: 8/1/26 No. of hours/week: 40 Work schedule: M-F 7:30-4:00

Justification of need for position: INSPECT FOR PROPER INSTALLATIONS OF HVAC & DUCT WORK IN RESIDENTIAL & COMMERCIAL PROPERTIES

What are the likely consequences if the position is not filled?
UNSAFE & IMPROPER INSTALLATIONS, CREATING UNSAFE CONDITIONS

APPROVALS

Annual salary requirements: $81,619.20 Hourly Rate: $39.24 FY 2027 rate Benefits: $60.20 Hourly | $125,211.36 Annually
(Payroll taxes, pension, health ins.- assuming family)

Is position budgeted for this and future FYs? ☐ Yes ☐ No If no, how will position be funded? _____

Approved subject to the following conditions: _____

Brian J Baker 6/2/26
Submitting Department Head Date

Signed by: Dave Boesen 6/11/2026
Mayor 393E8397B3D3421... Date

Signed by: kim Bahr 6/12/2026
Chief Financial Officer B560AC55EBBD4A3... Date

Signed by: LANCE DUNN 6/11/2026
Human Resources Director 7C0E7B7B4358427... Date

Signed by: 6/12/2026
Human Resources Committee Chairperson B8B9558BCE5947... Date

Created 6/30/2017

Docusign Envelope ID: B003E5D1-9ECE-87A3-83F3-11C8480709A0

PERSONNEL REQUISITION

The following questions are provided as guidelines to assist you in developing your rational for the position of MECH INSPECTOR in the BUILDING DEPARTMENT Department. Depending upon your situation, some questions may or may not apply. Please provide written responses to these questions as part of your preparation for meeting with the Mayor.

(1) What are the key job responsibilities of this position?

INSPECT FOR PROPER INSTALLATIONS OF HVAC EQUIPMENT, DUCTWORK + BOILERS

(2) Can the job responsibilities of this position be assigned to other employees within the department? If no, why not?

NO, OTHER EMPLOYEES ARE NOT TRAINED IN THE FIELD OF HVAC

(3) How is the work of this position being accomplished now?

CHIEF MECHANICAL INSPECTOR IS STILL CURRENTLY WORKING

(4) Are the filled positions in your department currently being utilized to their maximum potential?

EACH INSPECTOR IS TRAINED AND SPECIALIZED IN THEIR FIELD

(5) How would filling this position meet the needs of your department or the City on either a short-term basis (if temporary position) or a long-term basis (if a regular position)?

IT WOULD FILL THE NEED FOR AN INSPECTOR FOR EACH TRADE

(6) What cost savings or revenues, if any, would your department or the City realize if this position is filled?

REVENUE WOULD BE GENERATED FROM PERMIT FEES

(7) If you are paying overtime or comp time within your department to accomplish this work now, how much overtime or comp time has been paid out or earned that is directly attributable to this position and over what period of time? N/A

(8) How has the work load or demands of your department changed in comparison to your staffing levels over the past three fiscal years? Provide statistics if possible.

WORK LOAD HAS REMAINED CONSISTENT, AND STAFF FOR THE DEPARTMENT HAS DECREASED

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(9) If this position is not filled, what affect will it have on your department? What work will not get done? What costs will you incur? Please be as specific as possible.

WOULD BE DIFFICULT TO CHARGE FOR PERMITS THAT COULDN'T BE INSPECTED BY A CERTIFIED MECHANICAL INSPECTOR

(10) How do you cover the responsibilities for this position whenever the incumbent is out on vacation?

INSPECT ONLY WHAT'S NECESSARY UNTIL INSPECTORS RETURN

(11) Is it possible that the City could outsource this position to an outside agency? If so, what savings, if any, would the City realize as a result of this change?

THE COST OF OUTSOURCING WOULD BE CONSIDERABLY HIGHER

(12) How would you rank this position in terms of its contribution to City business in comparison with other positions reporting to you?

AS IMPORTANT AS ALL OTHER CHIEF INSPECTORS FOR THEIR SPECIFIC TRADE

(13) How does this position impact the Goals and Objectives for the City adopted by the City Council?

FULFILLS THE POSITION OF INSPECTOR FOR THE CITY COUNCIL ADOPTED HVAC ORDINANCE

Note: Forward completed questionnaire to Human Resources Department with original copy of Personnel Requisition form & updated job description.

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CITY OF WATERLOO
IOWA
Community of Opportunity

CIVIL SERVICE NOTICE
CITY OF WATERLOO, IOWA
PROMOTIONAL EXAMINATION

CHIEF MECHANICAL INSPECTOR

DEPARTMENT	**BUILDING INSPECTIONS**
SALARY	**$38.24, WITH $1.00 INCREASE AFTER 6 MO**
FLSA	**NON-EXEMPT**
CIVIL SERVICE	**INCLUDED**
BARGAINING UNIT	**CONSTRUCTION & PUBLIC EMPLOYEES LiUNA Local #177**

GENERAL STATEMENT OF DUTIES

Skilled technical position, under the general direction of the Building Official responsible for performing onsite inspections to secure compliance with City of Waterloo ordinances and regulations governing the installation, repair, and operation of heating, air conditioning and other mechanical equipment with aptitude to be certified in plumbing, electrical, and building inspections.

EXAMPLES OF ESSENTIAL FUNCTIONS (Illustrative only)

These functions are considered essential for successful performance in this job classification.

1. Examine plans and specifications for mechanical constructions alterations and repairs.
2. Inspects new and existing mechanical controls including thermostats, limit switches, safety pilots, fan controls, and other devices in residences, businesses, public and private buildings for conformance with safety standards, codes, and ordinances.
3. Inspect work on required permits to see that mechanical work complies with ordinances and regulations and recommends methods for improvement.
4. Maintains precise and accurate records of work performed.
5. Assists the citizens and contractors in answering questions concerning the installations and repair of heating and air conditioning equipment and systems.
6. Investigates complaints regarding violations of air pollution standards.
7. Issues written or verbal orders for corrections of violations of City ordinances.
8. Works with the Heating Board in enforcement of City ordinances.
9. Gives advice to other city inspectors.
10. Works independently and with others with minimum supervision.
11. Attends work regularly at the designated place and time.
12. Performs all work duties and activities in accordance with City policies, procedures and OSHA, City and department safety rules and regulations.
13. Performs all other duties as assigned.

Docusign Envelope ID: B003E5D1-9ECE-87A3-83F3-11C8480709A0

REQUIRED KNOWLEDGE, SKILLS, AND ABILITIES

1. Knowledge of standard practices, tools, and terminology of the heating and air conditioning trade.
2. Ability to read and work from blueprints, plans, and diagrams.
3. Ability to express ideas both orally and in writing.
4. Ability to exercise independent judgment in completion of assigned projects.
5. Ability to respond to questions and comments from members of the public tactfully and politely.
6. Ability to communicate effectively and maintain working relationships with coworker, supervisors, elected officials, and the public.
7. Ability to work with people from a broad variety of social, economic, racial, ethnic and educational backgrounds.
8. Ability to use a computer and various software programs: Microsoft Suite, OpenGov, Outlook, voicemail, etc.

ACCEPTABLE EXPERIENCE & TRAINING

1. High school diploma/equivalent.
2. Journeyman status in heating and air conditioning with a minimum ten (10) years of experience.
3. Iowa Class C Driver's License and good driving record based on City of Waterloo driver performance criteria.
4. Must be certified in building inspection through the International Code Council (ICC) within one year of employment; failure to obtain the certification may result in termination of employment.

ESSENTIAL PHYSICAL ABILITIES

The following physical abilities are required with or without accommodation.

1. Sufficient mobility to stoop, kneel, squat, climb, or bend/crouch sometimes in cramped and difficult to reach areas.
2. Required to work from flat surface or slopped roofs.
3. Ability to walk on uneven ground.
4. Required to work outdoors in all typed of weather extremes for extended periods of time. Working environment may be dry/dusty, slippery/wet, hot/cold, excessively noisy, low visibility; mechanical and electric hazards may be present; atmosphere may contain dust and fumes.
5 Required to posses color vision necessary to identify indicator lights on electric control panels, etc.
6 Sufficient depth perception and peripheral vision while driving, climbing, walking, carrying, or standing.
7. Ability to hear, understand, and carry out written and verbal instructions and to respond verbally to questions from supervisors, coworkers, and members of the public.
8. Ability to wear all appropriate safety equipment that is required for each work site i.e. hard hat, safety vest, safety eyewear, etc.
9. Ability to work safely around moving machinery; able to work safely in busy traffic areas and construction areas.
10. Ability to perform seated work for 20% of your day, the other 80% is composed of walking, moving, or standing.

Docusign Envelope ID: B003E5D1-9ECE-87A3-83F3-11C8480709A0

WORK SCHEDULE

Generally, 7:30-4:00 Monday through Friday. Hours may vary based on flexible scheduling or needs of the department.

EXAMINATION INFORMATION

All qualified candidates who apply by the deadline date will be required to appear before an interview panel consisting of a minimum of three people who have expertise in the areas being tested. An individual must receive a minimum average score of sixty points out of one hundred to achieve a passing score on the interview. The top applicants, as ranked by their scores on the interview, will be the individuals placed on the certified list. Applicants who qualify as outlined and are full time regular employees of the City of Waterloo shall have one additional point per full year of employment up to a maximum of five points added to their final score. Honorably discharged men and women from the armed forces of the United States who qualify per provisions of Chapter 35 of the Code of Iowa and who are citizens and residents of the United States shall have five additional points added to their final score upon submission of their DD214 or ten points added if they were awarded a Purple Heart or have a service connected disability.

CHIEF MECHANICAL INSPECTOR 2026

A.A./E.E.O.

Minority, female & disabled individuals are encouraged to apply.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Human Resources Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Motion approving the hiring of **Kate Winston** to the position of Human Resources Specialist in the Human Resources Department, effective September 9, 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. HUMAN_RESOURCES_SPECIALIST_7.2026[1]

Docusign Envelope ID: 88D96DE8-3D70-816D-803E-470E310B323D

PERSONNEL REQUISITION FORM

Check as applicable: ☒ To start recruiting or civil service process and/or ☐ To fill a vacancy
☐ Active Civil Service List Expires: _____

A proposed job description and questionnaire must accompany this form at time of submission to Human Resources.

****

Position Title: Human Resources Specialist_____ Department: Human Resources_____

Reports To: Assistant Director of HR/Director of HR Work Location: City Hall_____

Employment Status: ☒ Regular Full Time ☐ Temporary Full Time from _____ to _____
☐ Regular Part Time ☐ Temporary Part Time from _____ to _____
☐ Regular 7-Month ☐ Intern/Co-op Student from _____ to _____

Type of Position:
Civil Service Position: ☒ Yes ☐ No
Bargaining Position: ☐ Yes ☒ No
Bargaining Group: _____
Non-bargaining Position: ☒ Yes ☐ No

Recommended Recruitment Sources:
☒ Internal Posting Only
☐ Internal Posting and External Advertising

****

Complete the following if the requisition is to fill a vacancy:

☒ New Position or ☐ Replacement Position for: _____
(Specify name and title of former incumbent)

If replacement, former incumbent: ☐ Retired/Resigned/Terminated ☐ Transferred ☐ Promoted

Date incumbent terminated employment: _____ Date of final payout: _____

Anticipated start date: 8/1/2026 No. of hours/week: 40 Work schedule: M-F, 8am to 5pm

Justification of need for position: The workload increases as the City grows and so does the need for more personnel in the HR department. We have added a .5 administrative position to share with the Clerk's office and with adding this additional Specialists position we can continue to provide great service to the City and take on some new projects.

What are the likely consequences if the position is not filled? We can continue to operate but not add new work

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APPROVALS

Annual salary requirements: $61,089-$84,531 (Admin 4) Hourly Rate: $29.37-$40.64 Benefits: 52.14 hr/108,443.77 annual
(Payroll taxes, pension, health ins.- assuming family)

Is position budgeted for this and future FYs? ☒ Yes ☐ No If no, how will position be funded? _____

Approved subject to the following conditions: _____

Signed by: Missy Gearhart 7/7/2026
D8A71771BF7F484...
Submitting Department Head Date

Signed by: Dave Boesen 7/10/2026
393E8397B3D3421...
Mayor Date

Signed by: Bridgett Wood 7/10/2026
D88E184FDA5F48A...
Chief Financial Officer Date

Signed by: LANCE DUNN 7/10/2026
7CCE7B7B435842T...
Human Resources Director Date

Signed by: Steven J. Simon 7/10/2026
B839559BCEE0474...
Human Resources Committee Chairperson Date

Created 6/30/2017

Docusign Envelope ID: 88D96DE8-3D70-816D-803E-470E310B323D

PERSONNEL REQUISITION

The following questions are provided as guidelines to assist you in developing your rational for the position of *HR Specialist* in the *HR Department*. Depending upon your situation, some questions may or may not apply. Please provide written responses to these questions as part of your preparation for meeting with the Mayor.

(1) What are the key job responsibilities of this position?
This position is going to help with the hiring/interview process, civil service meetings, train to be a back-up with payroll process, work on recruiting efforts, continue moving engagement activities forward

(2) Can the job responsibilities of this position be assigned to other employees within the department? If no, why not? *These activities are currently done by other employees. By cross-training this position, it will allow the other HR Specialist more flexibility in her schedule. Taking over hiring and interviewing allows the assistant director to take on more strategic projects.*

(3) How is the work of this position being accomplished now?
The work is getting done but could be done better and there are more projects that we could be doing with more time.

(4) Are the filled positions in your department currently being utilized to their maximum potential? *We are working to our full capacity at this time.*

(5) How would filling this position meet the needs of your department or the City on either a short-term basis (if temporary position) or a long-term basis (if a regular position)? *There are several projects that I would like to see accomplished in our department, if the workload was spread out a bit more that would give me time to take care of those projects. Right now we are able to react and fix problems instead of being proactive.*

(6) What cost savings or revenues, if any, would your department or the City realize if this position is filled? *Right away there would not be any cost savings, in the future possible cost savings with some of the strategic planning and efforts/ideas I would like to implement.*

(7) If you are paying overtime or comp time within your department to accomplish this work now, how much overtime or comp time has been paid out or earned that is directly attributable to this position and over what period of time? *There has been minimal comp time earned*

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(8) How has the work load or demands of your department changed in comparison to your staffing levels over the past three fiscal years? Provide statistics if possible. *Research shows there should be one HR person for every 100 employees, we have over 700 full time and part time employees with a department of 4. We are very lean for a municipality our size and most departments are double in size of ours, our workload has vastly increased but we are trying to use technology to keep up to remain efficient. We will get to the point that we will have to add manpower to help with the work.*

(9) If this position is not filled, what affect will it have on your department? What work will not get done? What costs will you incur? Please be as specific as possible. *We get the work done that is necessary. There are things that we could be doing that we are not and we could be doing things better but that takes more time, which we do not have.*

(10) How do you cover the responsibilities for this position whenever the incumbent is out on vacation? *This position will be a back-up for the other HR Specialist, there are many tasks that the other specialist does now that have no back-up.*

(11) Is it possible that the City could outsource this position to an outside agency? If so, what savings, if any, would the City realize as a result of this change? *This is a specialized confidential position, I do not think it would behoove the city to outsource this position.*

(12) How would you rank this position in terms of its contribution to City business in comparison with other positions reporting to you? *Employees may minimize the contributions that HR makes but we have a part in every new employee that starts at the organization, all the job descriptions, every paycheck, policy, etc. We are behind the scenes but important to making the city run efficiently.*

(13) How does this position impact the Goals and Objectives for the City adopted by the City Council? *The HR department is an important part of that success.*

Note: Forward completed questionnaire to Human Resources Department with original copy of Personnel Requisition form & updated job description.

Docusign Envelope ID: 88D96DE8-3D70-816D-803E-470E310B323D

CIVIL SERVICE NOTICE
CITY OF WATERLOO, IOWA
OPEN EXAMINATION

HUMAN RESOURCE SPECIALIST

DEPARTMENT	**HUMAN RESOURCES**
SALARY	**$61,089.60-$84,531.20 (Admin 4)**
FLSA	**NON-EXEMPT**
CIVIL SERVICE	**INCLUDED**
BARGAINING UNIT	**NON-BARGAINING**

GENERAL STATEMENT OF DUTIES

Assists the Assistant Human Resource Director in administering a comprehensive human resources program, provides backup for the department Administrative Secretary and performs a variety of duties related to hiring, interviewing, civil service processes, job postings, recruiting and orientations. The position is a confidential administrative position and the work is performed under the general direction of the Assistant HR Director, but considerable leeway is granted for the exercise of independent judgement and initiative. No supervisory responsibilities, but may direct the work of Administrative Secretary in absence of Assistant HR Director.

EXAMPLES OF ESSENTIAL FUNCTIONS (Illustrative only)

These functions are considered essential for successful performance in this job classification.

1. Assists in recruitment efforts and programs for all city positions.
2. Coordinates job postings, Civil Service meetings, interview panels, schedules interviews, and helps with job offers.
3. Ability to understand and implement Civil Service hiring guidelines.
4. Coordinate onboarding checklist with department head, other HR Specialist, and candidate to make sure that all pre-employment steps are done.
5. Collects applications for review for open positions, shares them with departments when the job posting has closed.
6. Updates employee payroll and benefit records and resolves discrepancies in benefits.
7. Assists with a variety of special programs including Safety/Wellness Fair, employee wellness activities, Engagement activities.
8. Provides back-up payroll assistance to the other HR specialist and can perform a variety of payroll and insurance administration functions including but not limited to the following:
    a. Enters deductions for payroll
    b. Complies amount of federal and state taxes due each payroll & transmits payments

Docusign Envelope ID: 88D96DE8-3D70-816D-803E-470E310B323D

   c. Generates reports and payments for MFPRSI, IPERS, health insurance carrier, life insurance, etc.
   d. Reviews payroll timecards for accuracy
   e. Runs all bi-weekly reports
   f. Ability to balance out gross payroll to federal taxable and Medicare taxable wages
9. Work with all others in the HR department to create and maintain a robust orientation program for new hires.
10. Social media engagement for the HR department.
11. Coordinate eligibility and enrollment for two Long Term Disability Programs
12. Calculate, approve, then process retirement payouts through payroll while observing state pension laws.
13. Handle all documentation retention, enrollment, and payroll deduction for the City's 457 plan.
14. All other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS, AND ABILITIES

1. Thorough knowledge of Civil Service, and fair hiring practices and how they intersect.
2. Ability to interact with others, explain complex issues to others in ways they will understand.
3. Ability to read and interpret multiple union contracts.
4. Ability to express ideas both orally and in writing.
5. Ability to keep confidential records and information in the department.
6. Ability to exercise independent judgment in completion of assigned projects.
7. Ability to respond to questions and comments from members of the public tactfully and politely.
8. Ability to communicate effectively and maintain working relationships with coworkers.
9. Ability to work with people from a broad variety of social, economic, racial, ethnic and educational backgrounds.

ACCEPTABLE EXPERIENCE & TRAINING

1. A bachelor's degree in human resources or related field, with some experience.
   OR
   An associate's degree in human resources with 5 to 10 years of experience.
2. HR certification – either SHRM or HRCI preferred.
3. Iowa Class C Driver's License and good driving record based on City of Waterloo driver performance criteria.

ESSENTIAL PHYSICAL ABILITIES

The following physical abilities are required with or without accommodation.

1. Sufficient strength and flexibility to perform assigned tasks.
2. Sufficient speech and hearing that permits the employee to communicate effectively with coworkers and the public.
3. Sufficient mobility to travel from building to building within the cities various departments.
3. Ability to perform seated work for 90% of your day, the other 10% is composed of walking or standing.

Docusign Envelope ID: 88D96DE8-3D70-816D-803E-470E310B323D

WORK SCHEDULE

Generally 8:00-5:00 Monday through Friday, with an hour lunch break.

EXAMINATION INFORMATION

All qualified candidates who apply by the deadline date will be required to appear before an interview panel consisting of a minimum of three people who have expertise in the areas being tested. An individual must receive a minimum average score of sixty points out of one hundred to achieve a passing score on the interview. The top applicants, as ranked by their scores on the interview, will be the individuals placed on the certified list. Applicants who qualify as outlined and are full-time regular employees of the City of Waterloo shall have one additional point per full year of employment up to a maximum of five points added to their final score. Honorably discharged men and women from the armed forces of the United States who qualify per provisions of Chapter 35 of the Code of Iowa and who are citizens and residents of the United States shall have five additional points added to their final score upon submission of their DD214 or ten points added if they were awarded a Purple Heart or have a service-connected disability. Employment is contingent on possession of a good driving record based on City of Waterloo driver performance criteria and passing a post job offer physical and drug test.

ORAL **EXAMINATION DATE**

All qualified candidates who apply by the deadline date will be notified of the time, place and date of the oral examination.

HUMAN RESOURCES SPECIALIST 26

A.A./E.E.O.

Minority, female & disabled individuals are encouraged to apply.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Human Resources Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Motion to approve the hiring of **Craig Denner** from the current Civil Service List to the position of Assistant Young Arena Manager at the Young Arena, effective September 9, 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. YA_Assistant_Manager_(exp_4.28)
2. ASSISTANT YOUNG ARENA MANAGER 2.2026

Docusign Envelope ID: 96B3F219-72E1-46E6-B012-F4E43D3065BD

715 Mulberry St, Waterloo, IA 50703
Phone: (319) 291-4303
Fax: (319) 291-4569
CITYOFWATERLOOIOWA.COM

April 17, 2026

TO: Honorable Mayor & City Council

We, the members of the Civil Service Commission, certify the following list of applicants, who are eligible based upon the examination process as set forth by the Civil Service Commission for the appointment to the position of Young Arena Assistant Manager for the City of Waterloo, Iowa Leisure Services. This list shall be used to fill any vacancy in the Young Arena Assistant Manager classification from April 17, 2026 – April 17, 2028.

CERTIFIED LIST

Jake Schaefer
Craig Denner

Respectfully submitted,

Signed by:
Dr. Bev Smith 4/18/2026
8EB5D26C60614A7...

Dr. Bev Smith Date

Dr. Robert Welch Date

Signed by:
Marianne Kurtenbach 4/17/2026
D35A1864B308445...

Marianne Kurtenbach Date

*January 6, 2025 the Waterloo City Council voted to suspend the Civil Service hiring practices for entrance positions as allowed by the Iowa Administrative Code section 400.12A until January 6, 2027; therefore no signatures are required to certify this list.

PERSONNEL REQUISITION FORM

Check as applicable: ☒ To start recruiting or civil service process and/or ☒ To fill a vacancy
☐ Active Civil Service List Expires: _____

A proposed job description and questionnaire must accompany this form at time of submission to Human Resources.

****

Position Title: Assistant Young Arena Manager Department: Leisure Services

Reports To: Young Arena Manager Work Location: Young Arena

Employment Status:
☒ Regular Full Time ☐ Temporary Full Time from _____ to _____
☐ Regular Part Time ☐ Temporary Part Time from _____ to _____
☐ Regular 7-Month ☐ Intern/Co-op Student from _____ to _____

Type of Position:
Civil Service Position: ☒ Yes ☐ No
Bargaining Position: ☐ Yes ☒ No
Bargaining Group: _____
Non-bargaining Position: ☒ Yes ☐ No

Recommended Recruitment Sources:
☒ Internal Posting Only
☐ Internal Posting and External Advertising

****

Complete the following if the requisition is to fill a vacancy:

☐ New Position or ☒ Replacement Position for: Joel Schares, Assistant Young Arena Manager
(Specify name and title of former incumbent)

If replacement, former incumbent: ☒ Retired/Resigned/Terminated ☐ Transferred ☐ Promoted

Date incumbent terminated employment: 5/22/26 Date of final payout: 6/12/26

Anticipated start date: 3/16/26 No. of hours/week: 40 Work schedule: 7:00am-4:00pm M-F

Justification of need for position: The Assistant Young Arena Manager handles all administrative duties of running Young Ice Arena in the absence of the Manager. The Assistant Manager also directly manages all aspects of concession operations, concession staff, and completes deposits for the facility ensuring proper revenue generation to help offset operational costs.

What are the likely consequences if the position is not filled? Concession operations will not be run appropriately ultimately lowering revenue generation and costing the City more money to own and operate Young Arena. The two remaining full time staff will get burnt out trying to handle more workload than is reasonable.

APPROVALS

Admin LB

Annual salary requirements: $69,118.40 Hourly Rate: $33.23 Benefits: $51.85 hourly/ $107,838.62 annually
(Payroll taxes, pension, health ins.- assuming family)

Is position budgeted for this and future FYs? ☒ Yes ☐ No If no, how will position be funded? _____

Approved subject to the following conditions: _____

Submitting Department Head 1/31/26 Date

Mayor Date

Chief Financial Officer Date

Human Resources Director Date

Human Resources Committee Chairperson Date

Created 6/30/2017

TODD DERIFIELD

From: JOEL SCHARES
Sent: Thursday, January 8, 2026 4:33 PM
To: TODD DERIFIELD; CHRIS DOLAN; NIKKI FISCHELS
Cc: JAKE SCHAEFER
Subject: Retirement

Good Afternoon,

This letter is to inform you of my intentions to retire from the City of Waterloo after 30 plus years of service.

It is likely that my last day of work will be on Tuesday, February 24 2026 with my retirement date as Friday, May 22 2026.

Thank you,

Joel Schares
Assistant Manager
125 Commerical Street
CITY OF WATERLOO
O: 319-291-4335
www.youngarena.com

PERSONNEL REQUISITION
Assistant Young Arena Manager

The following questions are provided as guidelines to assist you in developing your rational for the position of Assistant Young Arena Manager in the Leisure Services Department. Depending upon your situation, some questions may or may not apply. Please provide written responses to these questions as part of your preparation for meeting with the Mayor.

(1) What are the key job responsibilities of this position?

The Young Arena Assistant Manager is an administrative position under the general direction of the Young Arena Manager, responsible for coordinating all administrative, operational, concession, financial, and marketing activities at Young Arena.

(2) Can the job responsibilities of this position be assigned to other employees within the department? If no, why not?

No. All other employees are being used to their fullest potential.

(3) How is the work of this position being accomplished now?

Joel Schares is currently still on the job but will be retiring soon.

(4) Are the filled positions in your department currently being utilized to their maximum potential?

Absolutely.

(5) How would filling this position meet the needs of your department or the City on either a short-term basis (if temporary position) or a long-term basis (if a regular position)?

Young Arena hosts thousands of visitors each year and dozens of major events. Having quality leadership of the operation is key to the success of these events. The Assistant Young Arena Manager fills in for and assists The Young Arena Manager in any capacity but also directly handles many other specific tasks such as concession operations and concessions staffing.

(6) What cost savings or revenues, if any, would your department or the City realize if this position is filled?

The Assistant Young Arena Manager is responsible for all concession operations of the facility and the staff that operate those concession stands. Concession

revenue is the number one revenue source for Young Arena. Additionally the Young Arena Manager handles all deposits for the facility. This takes an organized, detail oriented professional to ensure these funds make it into the City's revenue accounts appropriately.

(7) If you are paying overtime or comp time within your department to accomplish this work now, how much overtime or comp time has been paid out or earned that is directly attributable to this position and over what period of time?

The incumbent to this position has not yet retired. Once he does retire there would be significant comp time attributed to filling his role if a permanent full time person is not appointed to fill this role.

(8) How has the work load or demands of your department changed in comparison to your staffing levels over the past three fiscal years? Provide statistics if possible.

Young Arena is probably the busiest it has ever been in its 31year history. Through that time full time staffing has remained consistent at three individuals. An Arena Manager, Assistant Manager, and Recreational or Facilities Specialist.

(9) If this position is not filled, what affect will it have on your department? What work will not get done? What costs will you incur? Please be as specific as possible.

Concession operations and related revenue generation at Young Arena will suffer. The other two staff members will quickly get burnt out handling an additional 33% more of the workload between the two of them.

(10) How do you cover the responsibilities for this position whenever the incumbent is out on vacation?

Other staff do the best they can to fill in for short periods of time however that is not a sustainable model long term.

(11) Is it possible that the City could outsource this position to an outside agency? If so, what savings, if any, would the City realize as a result of this change?

No, City staff is needed to best operate a City owned facility.

(12) How would you rank this position in terms of its contribution to City business in comparison with other positions reporting to you?

This position is equally as important to all other full time positions that report to me.

(13) How does this position impact the Goals and Objectives for the City adopted by the City Council?

The City of Waterloo's 2030 Community Vision or Strategic Plan is based on eight pillars. Pillar #7 of that plan is Sportstown USA. The Sportstown USA pillar states that Waterloo should be the most rec-friendly and sports-focused town in Iowa. Having a premier ice arena with numerous opportunities for competitive hockey, figure skating, youth wrestling, public skating and walking certainly bolsters Waterloo's position as Sportstown USA.

Note: Forward completed questionnaire to Human Resources Department with original copy of Personnel Requisition form.

CITY OF WATERLOO IOWA
Community of Opportunity

CIVIL SERVICE NOTICE
CITY OF WATERLOO, IOWA
PROMOTIONAL EXAMINATION

ASSISTANT YOUNG ARENA MANAGER

DEPARTMENT	**LEISURE SERVICES**
SALARY	**$67,100.80-$92,872**
FLSA	**NON-EXEMPT**
CIVIL SERVICE	**INCLUDED**
BARGAINING UNIT	**NON-BARGAINING**

GENERAL STATEMENT OF DUTIES

Administrative position under the general direction of the Young Arena Manager, responsible for coordinating all administrative, operational, concession, financial, and marketing activities at Young Arena. Will often work independently and with minimum supervision. Supervises full-time, temporary, and seasonal employees.

EXAMPLES OF ESSENTIAL FUNCTIONS (Illustrative only)

These functions are considered essential for successful performance in this job classification.

1. Coordinates concession operations at Young Arena.
2. Works with the Arena Manager to schedule custodial and maintenance staff and ensure adequate staffing is available for all events.
3. Responds to questions from the public concerning Young Arena.
4. Directs the work activities of temporary seasonal and full-time employees as assigned.
5. Prepares banking deposits and slips.
6. Prepares written records and reports.
7. Works with online payroll software to ensure Young Arena staff is paid appropriately.
8. Works independently and with others with minimum supervision.
9. Attends work regularly at the designated place and time. May be assigned to evening and weekend work.
10. Attends meetings with individuals and civic groups and organizations to promote and explain operations, policies, and programs at Young Arena.
11. Performs all work duties and activities in accordance with City policies, procedures, and OSHA, City and Leisure Services safety rules and regulations.
12. Performs all other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS, AND ABILITIES

1. Ability to instruct, train and supervise all Young Arena employees.
2. Ability to express ideas orally and in writing.
3. Ability to understand chemical hazard labels and keep chemical application records.
4. Ability to exercise independent judgment in completion of assigned projects.
5. Ability to respond to questions and comments from the public tactfully and politely.
6. Ability to communicate effectively and maintain working relationships with coworkers, supervisors, elected officials and the public.
7. Ability to work with people from a broad variety of social, economic, racial, ethnic and educational backgrounds.

ACCEPTABLE EXPERIENCE & TRAINING

1. Graduation from an accredited college or university with a bachelor's degree in business administration, Public Administration, Recreation, Facility Management or related area and a minimum of two years of experience working in Ice arena industry with supervisory experience and progressively more responsibility.

   OR

   High school graduation/G.E.D. with a minimum of three years of experience working in ice arena industry with supervisory experience and progressively more responsibility.

   OR

   Any equivalent combination of education and experience that provides the knowledge, skills and abilities necessary to perform the essential functions of the position.
2. Iowa Class C Driver's License and good driving record based on City of Waterloo driver performance criteria. A candidate with any of the following will not be considered for employment: loss of license for any reason during the period of candidacy for employment, if the candidate remains without a valid, current license for the position when the City issues an offer of employment; loss of license, plea of guilty, plea of no contest or its equivalent or conviction for OWI, reckless driving or other major moving violation include habitual violator within the previous five years; four or more citations for moving violations within the previous three-year period, excluding speeding violations of 10 mph or less over the posted speed limit; three or more citations for moving violations within the previous one-year period. After appointment to the position, disciplinary action or continuing employment status may be reviewed for the following: four or more moving violations within the previous three years, three or more moving violations within the previous one year or loss of license or conviction for OWI, reckless driving or other major moving violation including habitual violator within the previous five years; two or more at-fault accidents within a three-year period while driving on City business; three or more at-fault accidents within a three-year period. An applicant's driving record will be reviewed prior to an offer of employment and at least annually after hire.

ESSENTIAL PHYSICAL ABILITIES

The following physical abilities are required with or without accommodation.

1. Sufficient strength and flexibility to perform assigned tasks.
2. Sufficient speech and hearing that permits the employee to communicate effectively with coworkers and the public.
3. Sufficient depth perception, distance and peripheral vision to safely operate City vehicles, forklifts, etc. and equipment.

4. Sufficient hearing to understand verbal instructions, respond to questions from the public and diagnose equipment malfunctions.
5. Sufficient personal mobility that permits the employee to move around Young Arena.

MISCELLANEOUS

1. Must submit to City hiring requirements including pre-employment, post-accident, reasonable suspicion, and return-to-duty/follow-up alcohol and drug testing.
2. Following a conditional offer of employment, the City of Waterloo requires a physical examination and a drug test by a physician of the City's choice to determine if an applicant is capable of performing the essential functions of the position. Failure to pass the physical and drug test will result in withdrawal of the employment offer.
3. The City of Waterloo reserves the right to conduct a background investigation including driving, employment and education on any applicant being considered for this position. After a conditional offer of employment is made a criminal history record search may also be completed.
4. Must submit to and pass Civil Service examination procedures including a panel interview.

WORK SCHEDULE

Required to work evenings, weekends and Holidays. Work schedule is based on an 8-hour day/40-hour week. Actual shift start time and days worked may vary depending on event schedule and season. One-hour unpaid lunch break. Minimal overtime.

EXAMINATION INFORMATION

All qualified candidates who apply by the deadline date will be required to appear before an interview panel consisting of a minimum of three people who have expertise in the areas being tested. An individual must receive a minimum average score of sixty points out of one hundred to achieve a passing score on the interview. The top applicants, as ranked by their scores on the interview, will be the individuals placed on the certified list. Applicants who qualify as outlined and are full-time regular employees of the City of Waterloo shall have one additional point per full year of employment up to a maximum of five points added to their final score. Honorably discharged men and women from the armed forces of the United States who qualify per provisions of Chapter 35 of the Code of Iowa and who are citizens and residents of the United States shall have five additional points added to their final score upon submission of their DD214 or ten points added if they were awarded a Purple Heart or have a service-connected disability.

ORAL **EXAMINATION DATE**

All qualified candidates who apply by the deadline date will be notified of the time, place and date of the oral examination.

Assistant Young Arena Manager 2026

A.A./E.E.O.

Minority, female & disabled individuals are encouraged to apply.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Mayor Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Carole Gustafson, Board/Commission: Civil Service Commission, Expiration Date: September 8, 2032, New appointment.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Boards & Commissions Application_Civil Service Commission_Carole Gustafson

CITY OF WATERLOO
Community of Opportunity

CITY OF WATERLOO, IOWA
BOARDS & COMMISSIONS APPLICATION

Date: August 11, 2026

I, Carole Gustafson (Name), request to be appointed to (state preference):

1. Planning & Zoning 2. Board of Adjustment

Home Phone: _____ Cell Phone: 319-215-2267 Work Phone: _____

Email Address Carole50702@gmail.com

Home Address 819 Denver Street Waterloo, IA Zip Code 50702

Employer Retired Title _____

Employer Address _____ Zip Code _____

How long have you resided in Waterloo? 58 yrs Email address: Caroole50702@gmail.com

List current membership in organizations and offices held: None

I am available for meetings: ☑ A.M. ☑ P.M. ☑ Noon ☑ Evenings

I am available to serve on a Board/Commission the entire year: ◉ Yes ○ No If no, list months not able to serve: _____

Briefly explain your qualifications for appointment to a designated Board/Commission:
I served on both Planning/Zoning and Board of Adjustment in the past. I have started 5 no
(YWCA, Big Brothers-Big Sisters, El Centro Latino Americano, Bosnian Cultural Associati
Foster Care Review Board

Additional information and comments that may not be evident from information already on this form: ___

References (include phone numbers): Noel Anderson, Steve Schmitt, Grant Vreeder
Matt Miehe

I understand this application does not bind me to accept an appointment should it be offered, nor does it guarantee an appointment to a Board/Commission. If selected, I will be available to attend appropriate training sessions. This application will remain valid and on file for one calendar year from above date.

Signature Carole Gustafson

or **RETURN TO MAYOR'S OFFICE, 715 MULBERRY ST., WATERLOO, IA 50703 FAX 291-4286; EMAIL: mayor@waterloo-ia.org; PHONE 291-4301**

Rev 02/20/2020

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Mayor Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Mendoor L. Smith, Board/Commission: Human Rights Commission, Expiration Date: September 8, 2029, New appointment.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Boards & Commissions Application_Human Rights Commission_Mendoor Smith

CITY OF WATERLOO, IOWA
BOARDS & COMMISSIONS APPLICATION

Date: 08/09/2026

I, Mendoor L. Smith, request to be appointed to (state preference):
(Name)

1. Human Rights Commission 2. _____

Home Phone: +1 (319) 240-3690 Cell Phone: +1 (319) 240-3690 Work Phone: +1 (712) 253-8195

Email Address mendoor3@yahoo.com

Home Address Ravenwood Cir Zip Code 50703

Employer USIC Title Lead Tech

Employer Address 905 River Road, Suite 200, Indianapolis, Ind Zip Code 46240

How long have you resided in Waterloo? ___ yrs Email address: mendoor3@yahoo

List current membership in organizations and offices held: Have not held any memberships

I am available for meetings: ☐ A.M. ☑ P.M. ☐ Noon ☑ Evenings

I am available to serve on a Board/Commission the entire year: ◉ Yes ○ No If no, list months not able to serve: _____

Briefly explain your qualifications for appointment to a designated Board/Commission: I am a concerned citizen. I am college educated with multiple degrees. I have a care and concern for my city.

Additional information and comments that may not be evident from information already on this form: I really look forward to being able to assist where I can

References (include phone numbers): James McGinnis (972) 921-7622, Ondra Bradford, (319) 504-3590. Myquan Bailey, (319) 505-4717

I understand this application does not bind me to accept an appointment should it be offered, nor does it guarantee an appointment to a Board/Commission. If selected, I will be available to attend appropriate training sessions. This application will remain valid and on file for one calendar year from above date.

Signature _____

or **RETURN TO MAYOR'S OFFICE, 715 MULBERRY ST., WATERLOO, IA 50703 FAX 291-4286; EMAIL: mayor@waterloo-ia.org; PHONE 291-4301**

Rev 02/20/2020

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Mayor Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Lamie Kromah, Board/Commission: Human Rights Commission, Expiration Date: September 8, 2029, New appointment.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Boards & Commissions Application_Human Rights Commission_Lamie Kromah

Received 8/18/26

CITY OF WATERLOO
Community of Opportunity

CITY OF WATERLOO, IOWA
BOARDS & COMMISSIONS APPLICATION

Date: 8/17/26

I, Lamie Kromah (Name), request to be appointed to (state preference):

1. Human Rights 2. _____

Home Phone: 763-732-3837 Cell Phone: 763-732-3837 Work Phone: 319-232-6671

Email Address lamiemote@yahoo.com

Home Address 5804 Blue sage Road, Waterloo IA Zip Code 50701

Employer Exceptional person Inc (EPI) Title Direct support professional (DSP)

Employer Address 760 Ansborough Avenue, Waterloo IA Zip Code 50701

How long have you resided in Waterloo? 14 yrs Email address: lamiemote@yahoo.com

List current membership in organizations and offices held:

Liberians Association of Waterloo Served as Election commission chair. Served as member of Constitution committee.

I am available for meetings: ☐ A.M. ☐ P.M. ☐ Noon ☑ Evenings

I am available to serve on a Board/Commission the entire year: ◉ Yes ○ No If no, list months not able to serve: _____

Briefly explain your qualifications for appointment to a designated Board/Commission:

I hold a BBA degree in Accounting at the University of Liberia, West Africa.

Additional information and comments that may not be evident from information already on this form:

I worked with Ferguson Enterprise Inc. Waterloo for 13 years.

References (include phone numbers): Darlington Debah 978-569-8125

I understand this application does not bind me to accept an appointment should it be offered, nor does it guarantee an appointment to a Board/Commission. If selected, I will be available to attend appropriate training sessions. This application will remain valid and on file for one calendar year from above date.

Signature _____

or **RETURN TO MAYOR'S OFFICE, 715 MULBERRY ST., WATERLOO, IA 50703 FAX 291-4286; EMAIL: mayor@waterloo-ia.org; PHONE 291-4301**

Rev 02/20/2020

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Mayor Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Jennifer Stevenson, Board/Commission: Human Rights Commission, Expiration Date: September 8, 2029, New appointment.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Boards & Commissions Application_Human Rights Commission_Jennifer Stevenson

CITY OF WATERLOO
Community of Opportunity

CITY OF WATERLOO, IOWA
BOARDS & COMMISSIONS APPLICATION

Date: 06/17/2025

I, Jennifer Stevenson, request to be appointed to (state preference):
(Name)

1. Human Rights Commission 2. _____

Home Phone: 3195042883 Cell Phone: 3195042883 Work Phone: 3194642390

Email Address: jstevenson@elevateccbhc.org

Home Address: 6658 Pashby Rd Cedar Falls Zip Code: 50613

Employer: Elevate CCBHC Title: Executive Director

Employer Address: 405 East 5th street Waterloo Zip Code: 50703

How long have you resided in Waterloo? ___ yrs Email address: _____

List current membership in organizations and offices held: _____

I previously served as a Commissinoner in the Cedar Falls Human Rights Commission where I worked to protect human rights and promote diversity, equity, and inclusion in the community through advocacy, education, and outreach. (Early 2000's)

I am available for meetings: ☑ A.M. ☑ P.M. ☑ Noon ☐ Evenings

I am available to serve on a Board/Commission the entire year: ◉ Yes ○ No If no, list months not able to serve: _____

Briefly explain your qualifications for appointment to a designated Board/Commission:

My lifes work has always centered on helping people, and this role is a natural extension of that commitment.

Additional information and comments that may not be evident from information already on this form: ___

I am originally from Waterloo and graduated from West High School.

I have lived in Cedar Falls for over 20 years and have been an active member of the Cedar Valley community, wearing many different hats along the way.

For the past five years, I have been working in Waterloo. Additionally, I served as a Human Rights Commissioner in Cedar Falls, demonstrating my commitment to social justice

References (include phone numbers): _____

Shannon Henson 3195958846

I understand this application does not bind me to accept an appointment should it be offered, nor does it guarantee an appointment to a Board/Commission. If selected, I will be available to attend appropriate training sessions. This application will remain valid and on file for one calendar year from above date.

Signature _____

or **RETURN TO MAYOR'S OFFICE, 715 MULBERRY ST., WATERLOO, IA 50703 FAX 291-4286; EMAIL: mayor@waterloo-ia.org; PHONE 291-4301**

Rev 02/20/2020

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Lance Dunn, Human Resources Director
Human Resources Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Communication from the City Clerk's Office on the notice of the conclusion of employment of Cindy Young, Clerk II, effective August 17, 2026, with recommendation of approval of payout of $11,114.25 for unused benefits.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. YOUNG PAYOUT 9.8.2026

Docusign Envelope ID: 03B6AF69-0549-8714-8085-11E7B30F203C

City Council
Notice of Employment Severance

Today's Date: 8/24/2026 **Department:** City Clerk's Office

Effective Date: 8/17/2026 **Job Classification:** Clerk II

Employment Date: 3/18/2003 **Employee Name:** Cindy Young

The employment with the named City of Waterloo employee has been severed by reason of:

- ☐ **Retired**
  - **Disability Related** ☐ **No** ☐ **Yes**
- ☐ **Resigned**
- ☑ **Termination**
- ☐ **Other** _____

In accordance with City Policy, it is requested to allow payment which consists of the following:

Benefits	Total Hours	(x) Hourly Rate		Payout
Vacation-Accrued	52	$ 28.05		$ 1,458.60
Vacation-Current	207.61	$ 28.05		$ 5,823.46
Usable Sick Leave	0	$ 28.05	25%	$ -
Casual Hours	0	$ 28.05		$ -
Comp Time Pay	136.62	$ 28.05		$ 3,832.19
Unscheduled Leave	0	$ 28.05		$ -
Other Pay (Bday)	0	$ 28.05		$ -
		Total Payment		**$ 11,114.25**

Comments _____

Approved by Signed by: Kelley Felchle FE60BC0EFBC64AB... **Date** 8/24/2026

Human Resources Signed by: Mkki Fischels 4DB8626179FC45F... **Date** 8/24/2026

Council Agenda Date: 9/8/2026 KMW

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Lance Dunn, Human Resources Director
Human Resources Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Communication from the Leisure Services Department on the notice of the conclusion of employment of Chris Dolan, Young Arena Manager, effective August 14, 2026, with recommendation of approval of payout of $6,557.10 for unused benefits.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

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SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. 10195 DOLAN PAYOUT 8.14.2026

CITY OF WATERLOO IOWA
Community of Opportunity

City Council Notice of Employment Severance

Today's Date: 8/18/2026 **Department:** Leisure Services

Effective Date: 8/14/2026 **Job Classification:** Young Arena Manager

Employment Date: 1/18/1995 **Employee Name:** Chris Dolan

The employment with the named City of Waterloo employee has been severed by reason of:

- ☑ **Retired**
  - **Disability Related** ☐ **No** ☐ **Yes**
- ☐ **Resigned**
- ☐ **Termination**
- ☐ **Other** _____

In accordance with City Policy, it is requested to allow payment which consists of the following:

Benefits	Total Hours	(x) Hourly Rate		Payout
Vacation-Accrued	140.25	$ 44.23		$ 6,203.26
Vacation-Current	0	$ 44.23		$ -
Usable Sick Leave	8	$ 44.23	25%	$ 88.46
Casual Hours	6	$ 44.23		$ 265.38
Comp Time Pay	0	$ 44.23		$ -
Unscheduled Leave	0	$ 44.23		$ -
Other Pay	0	$ 44.23		$ -
		Total Payment		**$ 6,557.10**

Comments _____

Approved by _____ **Date** 8/20/26

Human Resources Nicole Fischels **Date** 08/20/2026

Council Agenda Date: 9/8/2026 KMW

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Lance Dunn, Human Resources Director
Human Resources Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Communication from the Street Department on the notice of the conclusion of employment of Kathy Keys, Equipment Operator I, effective July 31, 2026, with recommendation of approval of payout of $3,594.06 for unused benefits.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

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COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. KEYS PAYOUT 9.8.2026

CITY OF WATERLOO IOWA
Community of Opportunity

City Council Notice of Employment Severance

Today's Date: 8/6/2026 **Department:** Street Department

Effective Date: 7/31/2026 **Job Classification:** Equipment Operator I

Employment Date: 8/27/1991 **Employee Name:** Keys, Kathy

The employment with the named City of Waterloo employee has been severed by reason of:

- ☑ **Retired**
  - **Disability Related** ☑ **No** ☐ **Yes**
- ☐ **Resigned**
- ☐ **Termination**
- ☐ **Other** _____

In accordance with City Policy, it is requested to allow payment which consists of the following:

Benefits	Total Hours	(x) Hourly Rate		Payout
Vacation-Accrued	116.2	$ 31.95		$ 3,712.59
Vacation-Current	0	$ 31.95		$ -
Usable Sick Leave	0	$ 31.95	25%	$ -
Casual Hours	0	$ 31.95		$ -
Comp Time Pay	0.29	$ 31.95		$ 9.27
Unscheduled Leave	0	$ 31.95		$ -
Other Pay (W/E DUTY)	-4	$ 31.95		$ (127.80)
		Total Payment		**$ 3,594.06**

Comments _____

Approved by _____ **Date** 8/7/26

Human Resources Nicole Fischels **Date** 08/07/2026

Council Agenda Date: 9/8/2026 KMW

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Lance Dunn, Human Resources Director
Human Resources Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Communication from the Police Department on the notice of the conclusion of employment of Taylor McNamara, Police Officer, effective August 12, 2026, with recommendation of approval of payout of $159.85 for unused benefits.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. MCNAMARA PAYOUT 9.8.2026

CITY OF WATERLOO IOWA
Community of Opportunity

City Council
Notice of Employment Severance

Today's Date: 8/13/2026 **Department:** Police Department

Effective Date: 8/12/2026 **Job Classification:** Police Officer

Employment Date: 8/11/2025 **Employee Name:** Taylor McNamara

The employment with the named City of Waterloo employee has been severed by reason of:

- ☐ **Retired**
  - **Disability Related** ☐ **No** ☑ **Yes**
- ☑ **Resigned**
- ☐ **Termination**
- ☐ **Other** _____

In accordance with City Policy, it is requested to allow payment which consists of the following:

Benefits	Total Hours	(x) Hourly Rate		Payout
Vacation-Accrued	68.42	$ 38.42		$ 2,628.70
Vacation-Current	38	$ 38.42		$ 1,459.96
Usable Sick Leave	0	$ 38.42	25%	$ -
Casual Hours	0	$ 38.42		$ -
Comp Time Pay	39.12	$ 38.42		$ 1,502.99
Unscheduled Leave	60	$ 38.42		$ 2,305.20
Other Pay				$ (7,737.00)
		Total Payment		**$ 159.85**

Comments Per the WPPA Contract that was signed by Officer McNamara she is responsible for costs for her initial training. Those costs are $7,737.00 which will be deducted from her final pay out. I will attach all documents supporting this deduction.
FINAL PAY OUT AFTER PAYBACK IS $159.85.

Approved by _____ **Date** 8/24/26

Human Resources Nicole Gisclair **Date** 8/24/2026

Council Agenda Date: KMW 9/8/26

ADDENDUM B - REIMBURSEMENT AGREEMENT

This Agreement is entered into by and between the City of Waterloo, Iowa (City) and ____ (Employee).

RECITALS

WHEREAS, municipalities such as City incur large expenses in training and certifying police officers such as Employee; and

WHEREAS, experience in City and other municipalities shows that certified police officers seek employment other than at the municipality which trained them; and

WHEREAS, these costs cannot be recouped without Employee committing to a minimum number of years with City; and

WHEREAS, when Employee leaves employment with City without meeting a minimum duration, Employee must reimburse City for its costs.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained in this agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

Iowa Law Enforcement Academy (the Academy)
City and Employee agree that Employee will attend the Academy at City's sole expense to receive certification as a law enforcement officer in accordance with the Academy's training requirements. Training at the Academy is scheduled to begin__. City shall pay the expense of training and shall pay Employee's regular wages during the training. Employee agrees that he or she will be responsible for reimbursing City in accordance with the rules for reimbursement as set out in Exhibit A, which is attached and by this reference is made a part of this Agreement. Exhibit A, however, is an estimate only and reimbursement shall be for the actual total training expenses as incurred by City as those costs become known to City.

Duties
Employee may, at City's option, be required to work for the Waterloo Police Department while attending the training program. That work may entail patrolling, operating the computer system, performing clerical tasks, and any other duties as assigned by the Police Chief or the Chief's designee. The hours expended by Employee in attendance at the training course and service to the Waterloo Police Department shall be subject to the same limitations and compensatory time policies as apply to all police officers of City.

Probation
Employee shall be on a probationary period consistent with the Waterloo Police Department's policies and in accordance with Iowa law.

Full- time Status
Employee shall serve as a full time police officer for City upon graduation from the Academy and after meeting all criteria necessary to receive proper certification.

Minimum Duration Commitment
In consideration of providing this training and incurring all expenses incurred with it, Employee agrees to work for City as a police officer for at least three (3) years from the date Employee graduates from the Academy and has met all criteria necessary to receive certification.

1. Resignation or Termination for Egregious Conduct

In the event Employee voluntarily resigns form the Waterloo Police Department or is terminated from the Academy for egregious conduct without having served as a certified police officer for at least three (3) years, Employee shall immediately reimburse City for the total training expenses incurred in accordance with the following schedule. For purposes of this paragraph, egregious shall mean conduct that is any act of moral turpitude, or a crime classified as an aggravated misdemeanor or felony under the laws of the State of Iowa, or any conduct unbecoming a police office as defined in the General Orders of the Waterloo Police Department.

a. If Employee resigns or is terminated as described above less than one (1) year following completion of approved training, one hundred percent (100%) of the total training expenses.
b. If Employee resigns or is terminated as described above after one (1) year and up to two (2) years after certification, sixty-six point sixty-seven percent (66.67%) of the total training expenses.
c. If Employee resigns or is terminated as described above after two (2) years and up to three (3) years after certification, thirty-three point thirty-three percent (33.33%) of the total training expenses.

2. No Reimbursement

If Employee voluntarily terminates employment after the third (3rd) year, or at any time City involuntarily terminates employment, Employee shall not be responsible for any reimbursement for total training expenses.

3. Minimum Monthly Payment

Payment of any training costs owed to City by Employee shall be made in consecutive monthly payments in accordance with the following schedule:

a. At least one hundred dollars ($100.00) per month.
b. First payment shall be due thirty (30) days after Employee's date of termination and on the same date of each month thereafter until paid in full.
c. In the event Employee desires to pay in full, the payment shall be made within sixty (60) days following the date of termination.
d. Any delinquent payments shall accrue interest at the rate of 1.5% per month until satisfied in full.

4. Alterations to Agreement

This Agreement may not be amended, altered or cancelled without the express written approval of both parties.

Dated this_____day of_____, 20_____.

CITY OF WATERLOO, IOWA

_____ _____

Chief of Police or Designee Employee

CITY OF WATERLOO IOWA
Community of Opportunity

715 Mulberry St, Waterloo, IA 50703
Phone: (319) 291-4340
WATERLOOPOLICE.COM
CITYOFWATERLOOIOWA.COM

June 24, 2025

Taylor McNamara
711 W. 2nd Street
Cedar Falls, IA 50613

Ms. McNamara,

This letter is to confirm our offer of employment to you. Effective **August 11th, 2025,** you will begin employment with the Waterloo Police Department as a Police Officer, starting at a salary of **$35.95 per hour.** While we hope that you accept this offer, nothing in this letter should be construed as creating an employment contract for a definite period of time.

As a requirement of your employment, you will be required to successfully complete **all** training associated with this position, including passing fitness testing to gain admittance into the Iowa Law Enforcement Academy. You must successfully complete the entire background, medical physical and MMPI examination. In addition, you must meet the residency requirement of the City of Waterloo, which is to reside within 30 miles of City Hall. You also must comply with all provisions of the current Collective Bargaining Agreement between the Waterloo Police Protective Association and the City of Waterloo, including the reimbursement agreement. In the event **all** the requirements described in this offer are not met this offer will be rescinded.

Should you desire any additional information, please contact Lieutenant Rob Camarata at 319-291-4340 *3202. Upon acceptance of this offer, please sign below and return a copy to me.

Sincerely,

Robert Duncan
Chief of Police

ACCEPTED BY: Taylor McNamara 6/30/25
Taylor McNamara Date

Notary:

ROB C. CAMARATA
COMMISSION NO. 751969
MY COMMISSION EXPIRES
3/29/26

Hy-Vee
A Helpful Smile in Every Aisle

Catering Invoice

To: Iowa Law Enforcement Academy
7105 NW 70th ave - Burma RD - Bldg. 4640
Johnston, IA 50131

Date: August 20, 2025
Invoice #: 12240152
Cadet Name: McNamara, Taylor
Organization: WATERLOO POLICE DEPARTMENT

Department	Job	Payment Terms	
Kitchen	Law Enforcement Academy Total	Contract	
Qty	**Description**	**Unit Price**	**Line Total**
14.00	Monday Meals	$39.50	$553.00
15.00	Tuesday Meals	$39.50	$592.50
15.00	Wednesday Meals	$39.50	$592.50
14.00	Thursday Meals	$39.50	$553.00
14.00	Friday Meals (no dinner)	$26.00	$364.00
2.00	Holiday/Graduation day meals (no dinner)	$26.00	$52.00

Subtotal	$2707.00
Sales Tax	0.00%
Total	**$2707.00**

Make all checks payable to: Hy-Vee
Remit to Address: Accounting | 351 NE Gateway Dr | Grimes, IA 50111
1224acctmgr@hy-vee.com
Hy-Vee thanks you for your business!

IOWA LAW ENFORCEMENT ACADEMY
STATE FISCAL OFFICE
BLDG 3465
7105 NW 70TH AVENUE
JOHNSTON, IA 50131-1824

INVOICE

INVOICE DATE: 01/27/26
INVOICE NUMBER: 332326
CUSTOMER ACCOUNT: WATERPD

BILL TO:

WATERLOO POLICE DEPARTMENT
715 MULBERRY STREET
WATERLOO, IA 50703

State Fiscal Year: 2026
Federal Fiscal Year: 2026

QTY	DESCRIPTION	UNIT PRICE	AMOUNT
4	Basic Academy Peace Officer Training At ILEA From 01/05/26-04/24/26 For: Dylan Brown, Abelardo Gil-Sanchez, Taylor McNamara & Anel Nadarevic	4800.00	19200.00
	Credits May Not Be Used On This Invoice		
		TOTAL	19200.00

Make all checks payable to Iowa Law Enforcement Academy

*da

----------**DETACH AND INCLUDE BOTTOM PORTION WITH PAYMENT**----------

----------**INCLUDE THIS PORTION WITH PAYMENT**----------

INVOICE NUMBER: 332326 Due Date: Customer Acct.: WATERPD

*** ILEA - ACCOUNTING PURPOSES ONLY ***

LINE NO.	FUND	AGNCY	UNIT	SUB UNIT	REV SOURCE	AMOUNT
1.	!fa	!ja	8000	BT	0690	19200.00
2.	!fb	!jb				
3.	!fc	!jc				
4.	!fd	!jd				
5.	!fe	!je				
6.	!ff	!jf				
7.	!fg	!jg				

Audited By: bsmith TOTAL:$!ta

IOWA PRISON INDUSTRIES
406 N. High St.
ANAMOSA, IA 52205
Building Brighter Futures

INVOICE

Invoice No.	Date
390368	9/22/2025
Refer to Invoice Number 390368	

SOLD TO: WATERLOO POLICE DEPT
715 MULBERRY ST
WATERLOO, IA 50703

SHIP TO: TAYLOR MCNAMARA
ILEA CAMP DODGE SEPT 2025
WATERLOO, IA 50703

Attn:

ATTN: CHRIS GERGEN 319-291-4340

Sales Order	Cust No	Customer PO #	Order Date	Tax	Mark Shipment	Terms
3900354-0000	WAT304		7/31/2025	E	ILEA	NET 30

Sales Rep	Ship Date	Shipped Via	F.O.B. Point	Ins	Waybill Number
KEVIN PETERSON	9/5/2025				

Item	T	Quantity Order	Quantity B/O	Quantity Ship	Part Number/Revision	Description	Unit Price $	Amount $
						Chris Gergen 319-291-4340 gergenc@waterloopolice.com ========== WEB ORDER #: 181543		
001	S	2.0000		2.0000	FTAC6OZWBLK10RREL	TAC PANT BLACK 10 REG RELAXED TAC PANT BLACK 10 REG RELAXED Variants: Size: 10 REGULAR	38.9900	77.98
						TOTAL: $		77.98

ORD142GI

\\IPIGLOBAL01\APPS\INFISY\BUSINT\IPICURRENTFORMS\FORMS\OE_INVOICE_IPI.RPT

Rev: 2/8/2018 - 10:07:08AM

Custom orders are not returnable and standard returned items will constitute a restocking charge.
Storage charges will be assessed on orders that remain unshipped & exceed their due date by 7 days.
Notice of discrepancy or damage must be made within 48 hours of receipt.
Past due balances are subject to a 1.5% (18% per annum) finance charge.

Questions about your invoice? Call 800-332-7922
Want to pay your invoice Online? Go to:
https://www.iaprisonind.com/pay-an-invoice.aspx

STATE AGENCIES: USE THE FOLLOWING ACCOUNTING CODES:
Fund: 0640 Dept: 250 Orgn: 9999 Rev Source: 0702

Page: 1

IOWA PRISON INDUSTRIES
406 N. High St.
Building Brighter Futures ANAMOSA, IA 52205

INVOICE

Invoice No.	Date
386578	9/22/2025
Refer to Invoice Number	
386578	

SOLD TO:
WATERLOO POLICE DEPT
715 MULBERRY ST
WATERLOO, IA 50703

SHIP TO:
WATERLOO POLICE DEPARTMENT
CAMP DODGE SEPT 2025
TAYLOR MCNAMARA
WATERLOO, IA 50703

Attn:

ATTN: CHRIS GERGEN 319-291-4340

Sales Order	Cust No	Customer PO #	Order Date	Tax	Mark Shipment	Terms
3710944-0000	WAT304		7/31/2025	E		NET 30

Sales Rep	Ship Date	Shipped Via	F.O.B. Point	Ins	Waybill Number
KEVIN PETERSON	8/21/2025				

Item	T	Quantity Order	Quantity B/O	Quantity Ship	Part Number/Revision	Description	Unit Price $	Amount $
						Chris Gergen 319-291-4340 gergenc@waterloopolice.com ========== WEB ORDER #: 181543		
001	S	1.0000		1.0000	FILEAPACKAGESPF	ILEA BASIC PACKAGE SPRING-FALL 3 - SMALL GOLD WORKOUT SHIRT 2 - SMALL GOLD S/S TEE 1 - SMALL GOLD L/S TEE 3 - SMALL CHARCOAL POLO 1 - SMALL GOLD SWEATSHIRT 1 - MEDIUM BLACK SWEATPANTS 2 - MEDIUM BLACK MESH SHORTS 1 - OSFA BLACK BEANIE CAP 1 - OSFA BLACK TWILL CAP	152.0200	152.02
						TOTAL: $		152.02

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Rev: 2/8/2018 - 10:07:08AM

Custom orders are not returnable and standard returned items will constitute a restocking charge.
Storage charges will be assessed on orders that remain unshipped & exceed their due date by 7 days.
Notice of discrepancy or damage must be made within 48 hours of receipt.
Past due balances are subject to a 1.5% (18% per annum) finance charge.

Questions about your invoice? Call 800-332-7922
Want to pay your invoice Online? Go to:
https://www.iaprisonind.com/pay-an-invoice.aspx

STATE AGENCIES: USE THE FOLLOWING ACCOUNTING CODES:
Fund: 0640 Dept: 250 Orgn: 9999 Rev Source: 0702

Page: 1

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Steven Kjergaard, Director of Aviation
Airport Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Motion to receive and file Airport Board minutes of July 27, 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Airport Board Minutes of July 27, 2026

MINUTES

WATERLOO REGIONAL AIRPORT BOARD

Monday, July 27, 2026

I. ROLL CALL

Chair, David Deeds, called the meeting to order at 12:00 p.m.

Board Members Present:	Arlene Humble, Chris Bering, Scott Cook, Katy Susong, David Deeds, Scott Voigt (Teams)
Board Members Absent:	Gwenne Berry
City Officials Present:	Dave Morrow, City Council; Tim Andera, Planning (Teams)
City Officials Absent:	Hector Salamanca Arroyo and Steve Simon, Council Liaisons
Airport Staff Present:	Steven Kjergaard, Sheila Combs
Additional Attendees:	David Hughes, AECOM; Christina Cole and Lane Berry, Advance Aviation; Kayleigh Tarbet, Advance Aviation (Teams); Brad Musinski and Rob Sims, Mead & Hunt (Teams); Rhona DiCamillo, DKMG Consulting (Teams); Marty Hoel, AOPA; Keith Kaspari, Rep Hinson District Representative

II. AGENDA AS RECEIVED OR AMENDED

Moved by Mrs. Susong, seconded by Mr. Cook, to approve the agenda as received. Ayes: 5. Motion carried.

III. PUBLIC COMMENTS

Marty Hoel asked for verification that the Airport closure is still on track for September 8th. Mr. Kjergaard affirmed that is the start date. The plan is to reopen the airfield on the morning of September 23rd (barring weather delays).

IV. REPORTS

A. Airport Director's Written Summary

No discussion.

B. Legislative Updates

N/A

C. Miscellaneous Airport Reports

Mr. Bering questioned why June enplanements were so much lower than in June 2025. Mr. Kjergaard responded that there were six cancelations in June '26, due to severe storms, which affected the overall passenger numbers.

V. BOARD APPROVAL

A. Approval of Minutes of June 22, 2026 Meeting

Mrs. Humble moved approval of the minutes of the June 22, 2026 meeting, seconded by Mr. Bering. Ayes: 5. Motion carried.

B. Motion to Receive and File June 2026 Expenses

Mrs. Humble moved that the June 2026 expenses be received and filed, seconded by Mrs. Susong. Ayes: 5. Motion carried.

VI. OLD BUSINESS

A. Mead & Hunt Governance Transition Study

Brad Musinski, Mead & Hunt, and Rhona DiCamillo, DKMG Consultants, discussed the financial aspects of the funding options, and answered the Board members' questions.

Moved by Mr. Cook, seconded by Mrs. Humble, to submit the agreement for City Council approval. Ayes: 5. Motion carried.

VII. NEW BUSINESS

A. Advance Media Marketing Update

Christina Cole introduced Lane Berry, who is new to the ALO team. Ms. Berry gave a brief overview of her background. Kayleigh Tarbet then reviewed some of the new creative images for the website, as well as upcoming campaign changes.

B. Request from T-Hangar Tenant for September Partial Rent Abatement

Board discussed a request from a T-Hangar tenant for a rent abatement for the two-week airport closure planned for September for the rehabilitation of the intersection of both runways. Members with knowledge of recent closures at nearby airports mentioned that none of them had reduced rent or granted abatements, including one that had a three-month closure.

Moved by Mr. Voigt, seconded by Mr. Cook, to deny the request. Ayes: 5. Motion carried.

C. Minimum Standards Update – Review and Be Ready to Discuss in August

Mr. Kjergaard asked that Board members review the draft document and be ready to discuss it in more detail next month. Comments or questions can be sent to him or brought to the meeting.

VIII. STAFF AND BOARD MEMBER COMMENT

None

IX. ADJOURNMENT

Moved by Mr. Bering, seconded by Mr. Cook, that the meeting be adjourned at 12:53 p.m. Ayes: 5. Motion carried.

Respectfully submitted,

David Deeds, Chairperson

CITY OF WATERLOO, IOWA
BOARD OF ADJUSTMENT MINUTES
REGULAR MEETING - 4:00 P.M., JULY 28, 2026

The regular meeting of the City of Waterloo Board of Adjustment was called to order by Chairperson Thornsberry at 4:00 p.m., in the Harold E. Getty Council Chambers at Waterloo City Hall.

Members present were: Jeri Thornsberry, Tom Powers, and John Beckman.

Members present electronically: None.

Members absent were: Ras Smith and Craig Holdiman

Others present were: Noel Anderson, Joseph Geilman, and John Dornoff from the Planning Department; Dave Morrow - Waterloo City Council; and 5 citizens.

Others present electronically: Steven Schmitt – Waterloo City Council.

I. Approval of the Agenda

It was moved by Beckman and seconded by Powers to approve the amended agenda, correcting the name on the first applicant. Motion carried unanimously.

II. Approval of the Minutes from the regular meeting on June 23, 2026.

It was moved by Powers, seconded by Beckman, to approve the minutes of the June 23, 2026, Board of Adjustment meeting. Motion carried unanimously.

III. Decision Items

1. Request by A-Line EDS for a variance to the fence requirements to allow for a 14-foot tall fence, 6 feet more than the 8-foot allowed in the "M-1" Light Industrial District located at 808 Dearborn Avenue.

Dornoff read the staff report recommending approval of the request.

Beckman asked if this would create any line-of-sight problems, to which Dornoff stated no.

Jon Hauptly, 2906 Violet Drive, Hauptly Construction, stated he would be building the fence, and it will be 1,271 feet long with 450 feet of the fence having the retaining wall, which will only be 6 feet tall, and the fence will be 10 feet tall.

Thornsberry asked how long it will take to build the fence, to which Hauptly stated he is waiting for approval from engineering and went into the details of the work to be done, and it will take about two weeks.

Beckman asked whether the pictures in the packet were a good representation of the fence, to which Hauptly answered yes, adding that it would be prettier because the metal would be facing outward.

Beckman noted that there is chain link closer to Rooff Avenue, to which Hauptly said no, and Dornoff noted that the chain link is part of the former Sheetz storage buildings that are now owned by A-Line EDS but not being used for the Salvage Yard.

It was moved by Beckman, seconded by Powers, to approve, per staff recommendation, the request by A-Line EDS for a variance to the fence requirements to allow for a 14-foot tall fence, 6 feet more than the 8-foot allowed in the "M-1" Light Industrial District located at 808 Dearborn Avenue. Motion carried unanimously.

2. Request by Senior Tequila LLC to establish non-limited alcohol sales use (on-premise consumption) and a variance to allow a non-limited alcohol sales use (on-premise consumption) to be within 250 feet of protected uses (residences) in the "M-1" Light Industrial District located at 118 East 11th Street.

Geilman read the staff report recommending approval of the request with the following condition: that the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, drainage, etc.

Beckman asked if this was being operated illegally, to which Geilman stated it was a legal non-conforming use as it did not conform to current rules.

Julissa Villalpando, 4805 Winghaven Drive, stated that it is owned by her and her mother and it was previously owned by my brother and mother, and it is just a minor change of ownership from my brother to myself.

It was moved by Powers, seconded by Beckman, to approve, per staff recommendation, the request by Senior Tequila LLC for a Special Permit to establish non-limited alcohol sales use (on-premise consumption) and a variance to allow a non-limited alcohol sales use (on-premise consumption) to be within 250 feet of protected uses (residences) in the "M-1" Light Industrial District located at 118 East 11th Street with the following condition: that the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, drainage, etc. Motion carried unanimously.

3. Request by Robert Frank to reconsider denial of the request for a two-year temporary variance to allow more than 4 vehicles on the property located in the "M-1" Light Industrial District located at 1107 Sheffield Avenue, which was denied at the 6/23/26 meeting.

Thornsberry went over the previous denial and the applicant's request for reconsideration.

It was noted that both Beckman and Powers have voted on the prevailing side and thus could move and second the request, per the adopted adiminstraive rules of the Board.

It was moved by Beckman, seconded by Powers, to approve, per staff recommendation, the request by Robert Frank to reconsider the denial of the request for a two-year temporary variance to allow more than 4 vehicles on the property located in the "M-1" Light Industrial District located at 1107 Sheffield Avenue, which was denied at the 6/23/26 meeting. Motion carried unanimously.

4. Request by Robert Frank for a two-year temporary variance to allow more than 4 vehicles on the property located in the "M-1" Light Industrial District located at 1107 Sheffield Avenue.

Dornoff read the staff report recommending denial of the request.

Robert Frank, 1107 Sheffield, was available to answer questions.

Beckman went over the request and noted it will probably not be for 2 years, to which Frank stated anything would help, and Beckman noted that once the decision is made, it is final.

Frank went over some of the health and physical issues he has had recently.

Beckman asked if the applicant understood the 6 month part to which Frank stated he did.

It was moved by Beckman, seconded by Powers, to approve the request by Robert Frank for a six month temporary variance to allow more than 4 vehicles on the property located in the "M-1" Light Industrial District located at 1107 Sheffield Avenue until January 29, 2027. Motion carried unanimously.

IV. Discussion

The next meeting of the Board of Adjustment will be on August 25, 2026 and Thornsberry noted she will not at the meeting.

Dornoff announced that Tummala is no longer with the Planning Department.

V. Adjournment

It was moved by Beckman, seconded by Powers, to adjourn the meeting at 4:28 p.m. Motion carried unanimously.

Respectfully submitted,



John Dornoff,
Planner II

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Noel Anderson, Community Planning and Development Director
Planning & Zoning Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Motion to receive and file Historic Preservation Commission minutes of July 2026.

RECOMMENDED COUNCIL ACTION

Approval

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Historic Minutes 7-21-26

WATERLOO HISTORIC PRESERVATION COMMISSION MINUTES
REGULAR MEETING – July 21, 2026– 4:30 P.M.
The meeting was held in the Mollenhoff Conference Room at City Hall

Chairperson Hedrick called the regular meeting of the City of Waterloo Historic Preservation Commission to order at 4:30 p.m.

Commission Members present were: Nick Hedrick, Ed Ottesen, and Cole Weliver.

Commission Members present electronically were: Jared Hottle

Commission Member(s) absent were: Alexander Hottle, Terry Stevens, and Ivan Valtchev

Others present were: Joseph Geilman- Planning Staff, and 8 member of the public

Approval of Agenda

Motion made by Weliver and seconded by Ottesen to approve the agenda of the July 21, 2026 regular meeting. Motion carried unanimously

Approval of Minutes

Motion made by Ottesen and seconded by Weliver to approve the minutes of the June 16, 2026 regular meeting. Motion carried unanimously.

Oral Presentations

No Report

Hearings

1. Request by Thomas and Ramona Glaza for a Certificate of Appropriateness to replace the roof on the house and garage with Malarkey Black Oak Shingles, and replace the gutters and downspouts, located at 257 Alta Vista Avenue.

Thomas and Ramona Glaza, 257 Alta Vista Ave, noted that they are looking to change the color of the shingles to black. They also noted that they will be replacing the gutters with gutters that will be a brown color similar to what is already there, as well as painting the siding of the house a tan color.

It was moved by Weliver and seconded by Ottesen to approve the request by Thomas and Ramona Glaza for a Certificate of Appropriateness to replace the roof on the house and garage with Malarkey Black Oak Shingles, and replace the gutters and downspouts, located at 257 Alta Vista Avenue. The motion passed unanimously.

2. Request by Terri Lasswell for a Certificate of Appropriateness to replace the existing white gutters and downspouts with black gutters and downspouts, located at 103 Highland Boulevard.

Terri Lasswell, 103 Highland Blvd, stated that the gutters need to be replaced, due to hail

damage. However, they are wanting to change the color from white to black. The commission discussed briefly.

It was moved by Ottesen and seconded by Weliver to approve the request by Terri Lasswell for a Certificate of Appropriateness to replace the existing white gutters and downspouts with black gutters and downspouts, located at 103 Highland Boulevard. The motion passed unanimously

3. Request by Brenda Parham for a Certificate of Appropriateness to build a 5 foot tall black chain link fence in the side and rear yard, located at 1129 Vine Street.

Brenda Parham, 1129 Vine Street, noted that they want to put up a black chain link fence to keep people out of their yard, since it is right next to the park and lots of people go through their yard. It has become a security issue, as there have been break-in attempts. Parham also noted that they will eventually be looking to put up black trim and black shingles. The commission discussed the request and noted that black chain link fencing has been approved before.

It was moved by Weliver and seconded by Ottesen to approve the request by Brenda Parham for a Certificate of Appropriateness to build a 5 foot tall black chain link fence in the side and rear yard, located at 1129 Vine Street. The motion passed unanimously

4. Request by Brock and Cole Weliver for a Certificate of Appropriateness to replace the existing brown asphalt shingles with black shingles on the house at 159 Prospect Avenue.

Brock and Cole Weliver, 159 Prospect Ave, noted that they are wanting to change the roof shingles from brown to black. The black shingles will be more historic, being closer to what was likely originally on the house. The commission briefly discussed the request.

Weliver noted that she will be abstaining, since this is her and her husband's request.

It was moved by Ottesen and seconded by J. Hottle to approve the request by Brock and Cole Weliver for a Certificate of Appropriateness to replace the existing brown asphalt shingles with black shingles on the house at 159 Prospect Avenue. The motion passed 2-0-1 (Weliver abstaining).

Building/ Project Consultation

No Consultations

Reports

1. **Main Street**

Ottesen noted that the design review did not have a meeting this month, but stated that the sample light pole for the replacement of the 4th Street light poles has been installed, so that will be a topic at the next meeting. He also noted that there was a Friday Loo last week, and that the Food truck festival is coming up.

2. Silos and Smokestacks

No discussion

3. Grout Museum

It was noted that the Imaginarium has been torn down. Ottesen asked why it didn't have to come before the Commission for approval. Geilman noted that it was built in 1965, so it was not old enough to be surveyed when the surveys of Waterloo were done. Since there were no surveys indicating whether it was historic or not, there was no reason for planning staff not to sign off on the planning approval portion of the demolition permit.

4. Highland Neighborhood

Hedrick and Weliver noted that the light poles were painted, and they look nice.

5. Walnut Neighborhood

No discussion.

Discussion Items/Possible Action Items

1. **Dunsmore House**

No discussion.

2. Collaborations

J. Hottle brought up a city that did 4 workshops a year with demonstrations from contractors about different aspects of historic properties, and how certain work is done. He noted that it would be cool to look into if this was possible here. There was further discussion on this, and Hottle stated that he will look into it more.

It was noted that Main Street is feeling that Tour de Loo as run its course, and will be focusing on the historic walk next year.

3. City-Owned Properties

No discussion

4. Goals and Action Plan

There were some discussions about different items on the plan, which could be switched out for something more productive and feasible next year.

Discussion Items

The state of the Mt. Moriah church building was discussed. The commission asked if the city was doing anything with it. Geilman stated that the city may be looking into it, but it is still privately owned. The commission brought up how bad of a condition it is in right now. Some of the commissioners stated that it may be too far gone to be able to save.

Adjournment

Motion made by J. Hottle and seconded by Weliver to adjourn the meeting at 4:57 p.m. Motion carried unanimously.

Respectfully submitted,



Joseph Geilman
Planner I

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Leisure Services Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Motion to receive and file Leisure Services Commission Board minutes of July 14, 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Board Mintues 7-14-2026

MINUTES
WATERLOO LEISURE SERVICES COMMISSION
TUESDAY, July 14, 2026
300 Jefferson Street

The meeting was held in the Cedar Valley SportsPlex Multipurpose Room at 300 Jefferson Street. The meeting was called to order at 7:30 am.

Present: Council Liaison Steve Simon, Council Liaison Hector Salamanca Arrroyo, Ellen Vanderloo, Jeremy Kruth, Tom Christensen, Allison Richter, Jessica Rucker
Staff: JB Bolger, Todd Derifield, Travis Nichols, Bob Etringer
Absent: Tim Moses, Robert Welch, Jake Schaefer, Logan Cinnamon

Ellen Vanderloo called for approval of the agenda. Jessica Rucker motioned to approve the agenda, second by Tom Christensen. Ayes: All Nays: None

Ellen Vanderloo called for motion for the approval of May 12, 2026 meeting minutes. Allison Richter motioned to approve the meeting minutes, second by Jeremy Kruth. Ayes: All Nays: None

REVIEW OF BILLS
Ellen Vanderloo called for approval of the bills. Questions were answered. Motion by Tom Christensen to approve May 2026 and June 2026 bills, Jeremy Kruth made a second. Ayes: All Nays: None

NATURE IN YOURE NEIGHBORHOOD
Hartman Reserve Nature Center staff will be in different neighborhood parks across Waterloo this summer including Byrnes Park, Gates Park, Exchange Park, and Greenbelt Lake. This program began in June and will continue until August. The staff will have a table set up with natural items that include animal furs, antlers, geodes, and small reptiles. (turtles, salamanders, and snakes) that children will be able to interact with.

WALNUT PARK UPDATE
Original groundbreaking scheduled for July 2nd was postponed due to the weather. All funds have been raised for this park. Bid documents for park amenities have been sent to the appropriate contractors by Ritland-Kuiper Landscape Architects.

STAFF UPDATES

Sports and SportsPlex – Bob Etringer
Optimist ball will finish up this week. The loo league will host playoffs at the Sportsplex throughout the week. Tennis lessons and swimming lessons are the current activities going on. Pool is open and running.

Questions were answered about the closing of the pool after opening day. Staff and board members discussed the injuries reported and methods performed by pool installation contractors to remedy.

Construction, Projects – Travis Nichols
We continue to do the summer garbage and restroom routes. We are doing park inspections and general maintenance from those inspections. The crew replaced the wood fiber mulch with rubber mulch at Cedar Terrace Park. We now have rubber at Hope Martin and Cedar Terrace. The crew did small repairs at Irv Warren and Gates golf courses. We have worked on the Paul Huting monument signage for the renamed Paul Huting Recreation Area. We also completed a washout of the trail at Brinker Lake. The Byrnes and Gates projects are still in punch list phase. The Tennis Center court resurfacing has started, and the contractor is working on back 10 courts first. We have staked out and are starting to install swing set at Sullivan Park. We have other CDBG at Edison (basketball court) and Elks Park (shelter). We did not get any of FY2027 grant applications approved for CDBG.

Golf and Downtown Area – JB Bolger
Golf Rounds Report for both May and June were distributed. At the end of June we were only 94 total rounds less than we were at this point last year and this is good news considering how wet and cold the start of the season was. The Waterloo Open Golf Tournament is this week. Golf courses are busy preparing the courses. This will be the first time ever that the Professionals will play all three courses. Half of the professional field will play Gates and half will play South Hills on Friday and then they will switch and play either Gates or South Hills on Saturday and then the top qualifiers of both the Professional and Amateur Fields will play Irv Warren on Sunday. In the last two months all of our crews have been busy helping with City wide festivals and events. Examples include My Waterloo Days, Juneteenth events, Chroma 63, and Red White and Loo Fireworks.

Forestry – Logan Cinnamon
Mowing crew is continuing to catch up from mid summer storms. They also continue with the seasonal tree watering route – all dependent on how much rain we receive. The trees that were planted this spring at Elks Memorial Park are all doing very well. Forestry crew has had a lot of new work come in with the hot weather and the storm season. Crews completed a trim at Soldiers & Sailors and Paramount Park for the 4th of July celebrations. The first round of Urban Forestry Development Grant paperwork came in and we are in the process of choosing a contractor for tree inventory. The second round is open and due by August 17th. The plan is to have the grant approval on the council agenda for August 3rd.

Young Arena – Jake Schaefer
Currently at the Young Arena we have contracted ice users, private ice rentals, birthday parties, and public skating through Thursday, June 12. The Waterloo Black Hawks Rookie Camp was held June 12–14, featuring four teams (80 players) and eight games. The Waterloo Black Hawks held their Main Camp on June 14–17, hosting approximately 150 participants across eight teams and completing 20 games with players from across the United States. The ice system was shut down and the ice sheet removed on June 17–19. A local car dealership utilized the arena floor on June 23 to train sales staff on ten new truck and SUV models. A local group of floor hockey enthusiasts have been renting the arena floor on Wednesdays and Sundays for organized ball-hockey sessions as they prepare for upcoming national tournaments. The Waterloo Black Hawks 2026–2027 home schedule was finalized on June 24. General cleaning, painting, and post-season facility reset have been ongoing since ice removal. Munters dehumidification unit—our primary arena air-conditioning system for the arena —

sustained storm damage on Sunday, June 7. Temporary repairs were completed to ensure functionality during Black Hawks camps. Replacement parts and preventative-maintenance items are on order, with full repair expected in early September. Ammonia ice system is scheduled for preventative maintenance and installation of new ammonia monitoring controls in the next two weeks. Zamboni room & ice runway cement repair and painting is scheduled for next week of July 20th. Ice painting and build up will begin on August 5th, in preparations for our first user groups on Monday August 17th.

The next regular Leisure Services Commission Meeting will be held Tuesday, August 11, 2026

Jessica Rucker made a motion to adjourn the meeting, second by Allison Richter. Ellen Vanderloo adjourned the meeting at 8:05 am.

*No audio recording for this meeting – recorder was not working properly.

Jessica M, Secretary

Jessica Rucker

8/11/2026

Date

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Planning & Zoning Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Motion to receive and file Planning, Programming, and Zoning Commission minutes of July 2026.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. P&Z Minutes July 14, 2026

MINUTES
CITY OF WATERLOO, IOWA
PLANNING, PROGRAMMING, AND ZONING COMMISSION
REGULAR MEETING - 4:00 P.M. JULY 14, 2026

The regular meeting of the Waterloo Planning, Programming, and Zoning Commission was called to order by Chairperson Leistikow at 4:00 p.m. via Zoom and in person in the Harold E. Getty Council Chambers at Waterloo City Hall.

Members present were: Cody Leistikow, Brandon Schoborg, Philip Shirk, Janelle Ewing, Scott Voight, Kristin Schaefer, Jessica Rucker, and Eric Donat.

Members absent were: Eric Poe.

Others present were: Noel Anderson, Aric Schroeder, Joseph Geilman, and John Dornoff – Planning Department; Jamie Knutson – City Engineer; Steve Schmitt and Hector A Salamanca Arroyo – City Council Liaisons; Dave Morrow – City Council Representative; and 25 citizens.

I. Approval of the Agenda

It was moved by Donat and seconded by Schoborg to approve the amended agenda, combining items A1 with C1 and A2, C2, and D1, and to move them to the end of the agenda. Motion carried unanimously.

II. Approval of the Minutes from the regular meeting on May 12, 2026.

It was moved by Schaefer and seconded by Rucker to approve the minutes of the May 12, 2026, meeting. Motion carried unanimously.

III. New Business

A. Special Permits

1. Request by Senior Tequila LLC to establish non-limited alcohol sales use in the "M-1" Light Industrial District located at 118 East 11th Street.

Geilman read the staff report recommending approval of the request with the following condition: That the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, drainage, etc.

There were no comments on this request.

It was moved by Rucker and seconded by Donat to recommend approval of the request by Senior Tequila LLC to establish non-limited alcohol sales use in the "M-1" Light Industrial District located at 118 East 11th Street with the following condition: That the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, drainage, etc. Motion carried unanimously.

B. Encroachment Agreements

1. Request by David Knipp for an encroachment agreement to allow for decorative rocks in the right-of-way of Bertch Avenue and West 7th Street in the "R-2" One and Two-Family Residence District located at 902 Bertch Avenue.

Dornoff read the staff report recommending denial of the request.

David Knipp, 902 Bertch, was available to answer questions.

Schoborg asked how many years the rocks have been there, to which Knipp answered that they have been there for 13 years, and the ones in the alley are there to keep people from wrecking his garage, while the ones along the street are there to keep people from driving in that area. Knipp further stated there are properties all across the city with materials in city-owned right-of-way and doesn't believe he should be singled out, and he keeps it neat, and this started by a disgruntled mail carrier.

Ewing asked if a snowmobile were to drive across the rocks, is that a safety hazard, to which Knutson answered that while he is not a lawyer, he would say yes, and the rocks would present a hazard, to which Ewing further asked if the rocks are there, can they sue the city, to which Knutson answered yes.

Voight asked if it's legal to drive a snowmobile within city limits, to which Knutson answered that would be a question for the police department, and Ewing responded even if it's not legal they could still sue the city.

Hector Salamanca Arroyo, City Council Member Ward 5, said the rocks have not been an issue and has talked to the applicant about the rocks, and if the city is going to clamp down, they need to clamp down across the street, and if a snowmobile gets hurt is their fault.

Ewing asked what the concerns from the city's point of view were, to which Knutson answered that the City of Waterloo Ordinances and the Engineering Ordinances require that rights-of-way be kept clear, and this belongs to all the residents of the city, and the issue becomes where do you draw the line, and there are no concerns about the rocks if they are moved back on his property.

Voight asked if they can plant trees in the right-of-way without permission, to which Knutson answered no; they have to go through Leisure Services and plant appropriate trees through an approved list that does not include trees with fruits and nuts that would fall on the right-of-way.

It was moved by Ewing and seconded by Schaefer to recommend denial of the request by David Knipp for an encroachment agreement to allow decorative rocks in the right-of-way at Bertch Avenue and West 7th Street in the "R-2" One and Two-Family Residence District, located at 902 Bertch Avenue. Motion carried 7-1 (Leistikow voted nay).

2. Request by Kathryn Gades for an encroachment agreement for a fence in the right-of-way of Avon Avenue and a retaining wall in the right-of-way of Thorson Avenue in the "R-2" One and Two-Family Residence District located at 405 Thorson Avenue.

Dornoff read the staff report recommending approval of the request for the encroachment agreement for the fence and denial of the request for the encroachment agreement for the retaining wall with the following condition: a fully signed and executed encroachment agreement.

Leistikow asked if there were any access easements in the area, to which Anderson responded that there would not be because it is city-owned right-of-way.

Ewing asked if the concern about liability is taken care of because the encroachment agreement indemnifies the city and takes care of the concern, to which Anderson answered yes.

Voight asked if the retaining wall is a terrace that the city owns, to which Knutson answered that the retaining wall is acting like a curb that the street does not have and this is a situation that the city has all over the city on unimproved streets where people will put railroad ties, bricks, etc., and the city has had them removed although he does understand the reason why people want to put them in but it is still right-of-way owned by the City. Knutson further stated that a snow plow will probably take it out, and it is a hassle for Public Works.

Voight asked if the retaining wall is not there, then the snow plow will damage the lawn, to which Knutson noted that if that happens, Public Works will come out and fix the sod.

Schoborg asked how long the retaining wall has been there, to which Knutson responded that if you look at Google Earth, it has been present since 2012.

Donat asked if there is a reason why there is no curb on the street, to which Knutson responded that, depending on the year the subdivision was done, the City did not require that curb and gutter be installed and noted there is about 6 miles of seal coat streets in the city and most of them do not have curb and gutter.

Kathryn Gades, 405 Thorson Avenue, stated that she is requesting this encroachment agreement for the retaining wall because it was there when she bought the property in February 2002, and it has not been a problem for 24 years.

Voight asked if the applicant was the only one with a retaining wall, to which Gades responded that she is the only one addressed on the street.

Shirley Sommerflet, 351 Thorson Avenue, stated that the retaining wall is attractive and serves the purpose for which it was put in, and that the applicant should be able to keep it.

It was moved by Ewing and seconded by Schaefer to recommend approval of the request by Kathryn Gades for an encroachment agreement for a fence in the right-of-way of Avon Avenue and denial of a request for an encroachment agreement for a retaining wall in the right-of-way of Thorson Avenue in the "R-2" One and Two-Family Residence District located at 405 Thorson Avenue with the following condition: a fully signed and executed encroachment agreement. Motion carried unanimously for approval of the encroachment agreement for the fence in the right-of-way of Avone Avenue and 7-1 (Voight voted nay) for denial of the request for an encroachment agreement for the retaining wall in the Thorson Avenue right-of-way.

C. Hearings – Rezones/Site Plan Amendments

1. Request by the City of Waterloo to rezone approximately 4.86 acres from "R-3" Multiple Residence District to "R-2,R-P" Planned Residence District and "R-3,R-P" Planned Multiple Residence District for the Development of 17 lots, including the expansion of Birdee Cottage located at 310 Upland Drive.

It was moved by Ewing and seconded by Donat to receive and place on file the statement of verification at 4:33 p.m. Motion carried unanimously, and Leistikow declared the hearing open.

Dornoff read the staff report recommending approval of the request.

Schoborg asked where the detention would be, to which Knutson answered Tract A.

Leistikow asked if Birdee Cottage will have to have its own stormwater detention plan, to which Knutson answered there will be a drainage ditch from Birdee Cottage and Tract A, with staff making an educated guess on the size of the new building and designing Tract A to handle it. If they would have more hard surfacing than is estimated, then they would need to do stormwater detention.

It was moved by Schoborg, seconded by Ewing, to close the public hearing. Motion carried unanimously. The hearing was closed at 4:39 p.m.

It was moved by Ewing and seconded by Donat to recommend approval of a request by the City of Waterloo to rezone approximately 4.86 acres from "R-3" Multiple Residence District to "R-2,R-P" Planned Residence District and "R-3,R-P" Planned Residence District for the Development of 17 lots, including the expansion of Birdee Cottage located at 310 Upland Drive. Motion carried unanimously.

2. Request by the City of Waterloo to rezone approximately 10.67 acres from "C-1" Neighborhood Commercial District and "A-1" Agricultural District to "R-3,R-P" Planned Residence District for the development of 14 lots of single-family homes and townhomes located along West 3rd Street and Norton Street west of Sergeant Road.

It was moved by Donat and seconded by Rucker to receive and place on file the statement of verification at 4:43 p.m. Motion carried unanimously, and Leistikow declared the hearing open.

Geilman read the staff report recommending approval of the request with the following condition: That the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, screening, drainage, etc.

Donat asked what the difference is between a townhome and a single-family home, to which Anderson responded that a townhome can be a three or fourplex.

Leistikow stated that he had concerns that homes would be built with garages sticking out front, as they would not be appropriate for this area, especially on this busy street, so there should be some discussion on that to which Anderson responded that the way staff has been approving development agreements to send to the City Council is that they have house designs so the Councilmembers can see them before they vote.

Rebecca Van Heiden, 2575 West 3rd Street, lives on the corner and feels that the corner is super busy and dangerous, as she almost gets hit every day trying to walk across the street and get her mail. Van Heiden also stated that you cannot back out of her driveway, especially when Fletcher is closed, as they use West 3rd/Norton/Home Park as an alternative route and are afraid that a car will not be able to stop at the curve and hit one of the new houses. In addition, she stated the area floods, and she has had up to two feet of water in her house.

Austin Van Heiden, 2575 West 3rd Street, asked about the notice letter and also stated that two to four cars at every one of those new homes will cause difficulties.

Voight stated that deepening the detention pond will not change the fact that Fletcher needs to be closed, to which Knutson explained why the city was making the changes and that it is in cooperation with the Corp of Engineers and also noted that there is a pump station on West 3rd that currently uses temporary hoses to lift water and that is being upgraded to permanent piping.

Leistikow stated that it appears that not all the lots are at least 50 feet wide, to which Anderson explained how there are markings on the plat with references that do make the lots at least 50 feet wide.

Leistikow asked if there had been any discussion about the traffic problems and speeding on West 3rd Street, to which Knutson noted that if there are concerns about speeding, the Police Department would need to be notified so they could look at increasing enforcement, and Knutson would talk to the Traffic Department and see if there are things that they can do.

It was moved by Schaefer, seconded by Donat, to close the public hearing. Motion carried unanimously. The hearing was closed at 4:57 p.m.

It was moved by Schoborg and seconded by Donat to recommend approval of a request by the City of Waterloo to rezone approximately 10.67 acres from "C-1" Neighborhood Commercial District and "A-1" Agricultural District to "R-3,R-P" Planned Residence District for the development of 14 lots of single-family homes and townhomes located along West 3rd Street and Norton Street west of Sergeant Road with the following condition: That the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, screening, drainage, etc. Motion carried unanimously.

D. Plats

1. Request by the City of Waterloo for the preliminary plat of Park View Manor, a 17-lot residential subdivision located at 310 Upland Drive.

Dornoff read the staff report recommending approval of the request.

This item was discussed under C-1.

It was moved by Ewing and seconded by Donat to recommend approval of the request by the City of Waterloo for the preliminary plat of Park View Manor, a 17-lot residential subdivision located at 310 Upland Drive. Motion carried unanimously.

2. Request by the City of Waterloo for the preliminary plat of Admore Addition, a 14 -lot residential subdivision located along West 3rd Street and Norton Street west of Sergeant Road.

Geilman read the staff report recommending approval of the request with the following condition: That the final site plan meets all applicable city codes, regulations, etc., including, but not limited to, parking, landscaping, screening, drainage, etc.

This item was discussed under item C-2.

It was moved by Schaefer and seconded by Donat to recommend approval of the request by the City of Waterloo for the preliminary plat of Admore Addition, a 14 -lot residential subdivision located along West 3rd Street and Norton Street west of Sergeant Road with the following condition: That the final site plan meets all applicable city codes, regulations, etc. including, but not limited to, parking, landscaping, screening, drainage, etc. Motion carried unanimously.

E. Vacates/Dedicates

1. Request by the City of Waterloo to vacate approximately 1,988 square feet of city-owned right-of-way of West 3rd Street at the intersection of Norton Street.

Geilman read the staff report recommending approval of the request.

This item was discussed under C-2.

It was moved by Schaefer and seconded by Donat to recommend approval of the request by the City of Waterloo to vacate approximately 1,988 square feet of city-owned right-of-way of West 3rd Street at the intersection of Norton Street. Motion carried unanimously.

IV. Oral Presentations

Dennis Harbaugh, 6145 Kimball Avenue, spoke in opposition to the proposed data center and the issues he has with it and stated that if it is put in, it will kill all economic development in the City of Waterloo, and the site as proposed is bad.

Carol Tjaden, 147 Summit Avenue, noted that the people have a lot of questions about the proposed data center and that the City Council doesn't even know how the process works to put in this data center.

Carolyn Belefie, 5036 Ansborough Avenue, stated she lives on a 6th generation farm that is close to the proposed data center and is opposed to it due to the amount of electricity it will use, water, and other issues, and it should be in a heavy industrial park and would like it not to go through.

Leistikow stated that it is a planned zone, so it will need to come to the Planning Commission for a Site Plan Amendment and then to City Council, and noted they have a lot of questions themselves.

Diane Sittig, 816 West Orange Road, stated that she agrees with everything that has been said, as she is on a 2nd generation farm, and it will be a half mile from her property, as it will create heat, noise, will destroy insects, and other negative effects will hurt their farming operations.

Justin Crow, 123 Tribble Road, stated he currently works in a place that deals with chemicals and is scared for the future since no one knows what the long-term effects are, and they are already telling us to cut back on water usage, and even a small data center can use 500,000 gallons of water.

Eva Garcia, 608 Summit Avenue, asked if the aquifer has been measured and supports those who have talked before.

Keith Rathjen, 700 West 1st Street, stated that everyone was blindsided about this project and feels betrayed.

Kathleen Shoemaker, 129 Irene Court, asked what research was done about the data center.

V. Discussion

VI. Adjournment

It was moved by Shirk and seconded by Schoborg to adjourn the meeting at 5:30 pm. Motion carried unanimously.

Respectfully submitted,



John Dornoff,
Planner II

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Kelley Felchle, City Clerk
City Clerk Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Motion to approve denying an application by Pryme Tyme, LLC, 626 Sycamore Street, for a Class C Retail Alcohol License.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Recommendation to suspend

CITY OF WATERLOO, IOWA

Waterloo Fire Rescue

425 E. Third Street • Waterloo, IA 50703 • Phone (319) 291-4460 • Fax (319) 291-4279

August 21, 2026

Waterloo City Clerk's Office
Waterloo City Council
715 Mulberry Street
Waterloo, IA 50703

RE: Recommendation Against Approval of Alcohol License – Pryme Tyme, 626 Sycamore St, Waterloo, IA 50703

Dear Clerk's Office and Members of the Council:

This letter serves as formal notification that Waterloo Fire Rescue does not recommend approval of the alcohol license application associated with Pryme Tyme, located at 626 Sycamore St, Waterloo, IA 50703. This recommendation is based on a sustained pattern of uncorrected fire code violations and unpaid inspection fees spanning more than six months, detailed below.

Inspection History

An initial annual fire inspection was conducted on 1/27/2026 in connection with the alcohol permit application. That inspection identified 14 code violations and assessed an $80.00 inspection fee. Because the violations were not corrected, the business has since undergone eight re-inspections. The first re-inspection fee was waived as a courtesy; each subsequent re-inspection resulted in a progressively escalating fee, per standard Fire Prevention Division policy, none of which have been paid. The most recent inspection, conducted 8/18/2026, confirmed with the business's on-site contact that no further repairs had been made.

Inspection Date	Inspection Type	Fire Code Violations	Fee Assessed	Violations Corrected
01/27/2026	Initial Annual Inspection	14 failed	$80.00	N/A – initial inspection
02/24/2026	Re-inspection #1	12 failed	$0.00 (fee waived)	No
03/19/2026	Re-inspection #2	9 failed	$100.00	No
04/16/2026	Re-inspection #3	7 failed	$150.00	No

CITY OF WATERLOO, IOWA

Waterloo Fire Rescue

425 E. Third Street • Waterloo, IA 50703 • Phone (319) 291-4460 • Fax (319) 291-4279

Inspection Date	Inspection Type	Fire Code Violations	Fee Assessed	Violations Corrected
05/08/2026	Re-inspection #4	7 failed	$200.00	No
06/03/2026	Re-inspection #5	7 failed	$200.00	No
06/25/2026	Re-inspection #6	7 failed	$200.00	No
07/22/2026	Re-inspection #7	7 failed	$200.00	No
08/18/2026	Re-inspection #8	7 failed	$200.00	No
TOTAL FEES ASSESSED	**$1,330.00**	**UNPAID**		

Outstanding Fire Code Violations

As of the most recent inspection on 8/18/2026, the following 7 fire code violations remain uncorrected and have been outstanding since the initial inspection on 1/27/2026:

Code Section	Violation	Location	Status
IFC 1013.1	Exit sign not oriented to properly direct egress travel	Near restrooms	Uncorrected since 1/27/26
IFC 1203.2.15	No documentation provided confirming means-of-egress (high-bay) emergency lighting is operational	High bay egress lights	Uncorrected since 1/27/26
IFC 603.2.2	Open electrical junction box lacking required cover	Basement, west of stairs	Uncorrected since 1/27/26
IFC 603.5.2	Power strip improperly daisy-chained to another power strip rather than a wall outlet	Bar area	Uncorrected since 1/27/26

CITY OF WATERLOO, IOWA

Waterloo Fire Rescue

425 E. Third Street • Waterloo, IA 50703 • Phone (319) 291-4460 • Fax (319) 291-4279

Code Section	Violation	Location	Status
IFC 701.5	Plywood covering a wall opening in place of a required rated fire door; no permit obtained	Bathroom hallway	Uncorrected since 1/27/26
IFC 704.1	Unrepaired hole in ceiling; no permit or inspection obtained	Ceiling	Uncorrected since 1/27/26
IFC 901.4.6	Smoke detectors found beeping and/or with covers removed, not properly maintained	Throughout building	Uncorrected since 1/27/26

Summary

Over the course of nine inspections conducted between 1/27/2026 and 8/18/2026, the business has failed to correct any of the outstanding fire code violations listed above and has not paid any portion of the $1,330.00 in fees assessed to date. Given this sustained noncompliance and the unresolved life-safety hazards identified above, Waterloo Fire Rescue is unable to sign off on the beer/liquor license application and recommends that the Council and Clerk's Office not approve the alcohol license for this business until all violations are corrected, verified by re-inspection, and all outstanding fees are paid in full.

Please direct any questions regarding this recommendation or the inspection history to the undersigned.

Respectfully,

Brock Weliver
Fire Marshal
Waterloo Fire Rescue

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT	MEETING DATE
City Clerk Department	September 8, 2026

AGENDA ITEM TITLE

Liquor Licenses

Brendas Park Road Inn, 306 Park Road, Class C w/Sunday Sales (Renewal) Exp: 08/08/2027.
Dub's Pub, 1106 La Porte Road, Class C w/Outdoor Service and Sunday Sales (Renewal) Exp: 09/12/2027.
Casey's General Store #2867, 2424 Ranchero Road, Class E w/Sunday Sales (Renewal) Exp: 06/14/2027.
Friends of Faith, 600 Park Lane, Class F, w/Sunday Sales (Ownership Update)
Highway 63 Diner, 3030 Marnie Road, Class C w/Sunday Sales (Renewal) Exp: 07/29/2027.
Landmark Commons, 1400 Maxhelen Road, Class E w/Sunday Sales (New) Exp: 08/31/2027.
Longhorn Steakhouse, 1425 E. San Marnan Drive, Class C w/Sunday Sales (Renewal) Exp: 08/31/2027.
Marshal BWS, 2060 Sovia Drive, Ste 112, Class E w/Sunday Sales (New) Exp: 06/30/2027.
Rome's Place, 201 Rath Street, Class C w/Sunday Sales (Ownership Update) Exp: 09/17/2026.
Senior Tequilla, 118 E. 11th Street, Class C w/Sunday Sales (Renewal) Exp: 05/18/2027.
WCA Building & Amphitheater, 225 Commercial Street, Class C w/Outdoor Service and Sunday Sales (Renewal) Exp: 06/22/2027.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

None

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Engineering Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Bonds.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION
These are Right-of-Way construction bonds for contractors wanting to do work within the City right-of-way. Work would include such items as plumbing repairs in the street, driveway construction and sidewalk construction. The bond ensures that if a contractor does not complete the work, the bonding company will step in and complete the work on the contractor's behalf.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. BONDS FOR COUNCIL APPROVAL_9.8.2026

RIGHT OF WAY BONDS
FOR
COUNCIL APPROVAL
September 8, 2026

100011309	CDB Utility Contractors Inc.	Davenport, IA
DSP0003982	Cascade Drilling, LP	Bothell, WA
7901114695	Mack Stanley dba Mack's Asphalt Maintenance	Waterloo, IA
89023177	Midwest Excavation and Trucking LLC	Clarksville, IA
2383786	Summers' Enterprise, Inc.	Masonville, IA
190058699	Woodruff Construction, Inc.	Fort Dodge, IA

RIGHT OF WAY CONSTRUCTION BOND

No. 100011309

Applicant's Telephone Number: 563-381-2194

KNOW ALL MEN BY THESE PRESENTS:

That (I), (We), CDB Utility Contractors Inc

of 11029 136th St., Davenport, Iowa,
Street City State

as Principal, and Merchants Bonding Company (Mutual) of

P.O. Box 14498, Des Moines, IA 50306-3498,

as Surety, are held and firmly bound unto the City of Waterloo, Black Hawk County, Iowa, in the penal sum of TWENTY THOUSAND DOLLARS ($20,000.00) lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Principal herein firmly binds (himself) (herself) (themselves) their heirs, executors and administrators, and the said Surety binds themselves, their successors, assigns, executors and administrators, jointly and severally, firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SUCH that, by the provisions of the Ordinances of the City of Waterloo, Iowa, a Surety Bond in the sum of Twenty Thousand Dollars ($20,000.00) must be filed with the City Clerk/Auditor of the City of Waterloo, Iowa, before one may engage in construction, reconstruction or excavation in the public right of way in said City.

NOW, THEREFORE, if the above bounden CDB Utility Contractors Inc of Davenport, IA will faithfully perform any and all duties and abide by any and all regulations required by said Ordinances regulating the construction, reconstruction and excavation projects within said City; and if (he), (she), (they) will promptly pay to said City any and all sums and amounts due or that may become due or owing by reason of or under said Ordinances; and if (he), (she), (they) will pay all fines imposed upon (him), (her), (them), or a violation of said Ordinances occurring during the life of this bond; and if (he), (she), (they) will indemnify and keep the City harmless from all liability for any accident and/or damages arising from (his), (her), (their) doing, protecting or completing the work, then this obligation to be null and void, otherwise to remain in full force and effect.

The effective date of this Bond is April 30, 2026, through April 30, 2027.

Witness our hands this 5th day of December, 2025.

CDB Utility Contractors Inc
PRINCIPAL

By: _____

Printed Name: Patricia Kenyon

PLEASE MAIL TO:

City of Waterloo, Iowa
Engineering Department
715 Mulberry Street
Waterloo, IA 50703

Merchants Bonding Company (Mutual)
SURETY

By: _____
Attorney-in-fact
James A. Hofter, Attorney-in-Fact

Updated 2-28-2023

PLEASE COMPLETE CHECKLIST ON REVERSE SIDE BEFORE SUBMITTING BOND.

LP 0467 IA (4/23)

MERCHANTS BONDING COMPANY™

POWER OF ATTORNEY

Know All Persons By These Presents, that MERCHANTS BONDING COMPANY (MUTUAL) and MERCHANTS NATIONAL BONDING, INC., both being corporations of the State of Iowa, and MERCHANTS NATIONAL INDEMNITY COMPANY , an assumed name of Merchants National Bonding, Inc., (herein collectively called the "Companies") do hereby make, constitute and appoint, individually,

James A. Holter

their true and lawful Attorney(s)-in-Fact, to sign its name as surety(ies) and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

This Power-of-Attorney is granted and is signed and sealed by facsimile under and by authority of the By-Laws adopted by the Board of Directors of the Companies.

"The President, Secretary, Treasurer, or any Assistant Treasurer or any Assistant Secretary or any Vice President shall have power and authority to appoint Attorneys-in-Fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof."

"The signature of any authorized officer and the seal of the Company may be affixed by facsimile or electronic transmission to any Power of Attorney or Certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship o obligations of the Company, and such signature and seal when so used shall have the same force and effect as though manually fixed."

In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.

In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner - Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

In Witness Whereof, the Companies have caused this instrument to be signed and sealed this 5th day of December , 2025 .

MERCHANTS BONDING COMPANY (MUTUAL)
MERCHANTS NATIONAL BONDING, INC.
MERCHANTS NATIONAL INDEMNITY COMPANY

By Larry Taylor
President

STATE OF IOWA
COUNTY OF DALLAS ss.

On this 5th day of December 2025 , before me appeared Larry Taylor, to me personally known, who being by me duly sworn did say that he is President of MERCHANTS BONDING COMPANY (MUTUAL), MERCHANTS NATIONAL BONDING, INC., and MERCHANTS NATIONAL INDEMNITY COMPANY; and that the seals affixed to the foregoing instrument are the Corporate Seals of the Companies; and that the said instrument was signed and sealed in behalf of the Companies by authority of their respective Boards of Directors.

NOTARIAL SEAL IOWA
Penni Miller
Commission Number 787952
My Commission Expires
January 20, 2027

Notary Public

(Expiration of notary's commission does not invalidate this instrument)

I, Elisabeth Sandersfeld, Secretary of MERCHANTS BONDING COMPANY (MUTUAL), MERCHANTS NATIONAL BONDING, INC., and MERCHANTS NATIONAL INDEMNITY COMPANY do hereby certify that the above and foregoing is a true and correct copy of the POWER-OF-ATTORNEY executed by said Companies, which is still in full force and effect and has not been amended or revoked.

In Witness Whereof, I have hereunto set my hand and affixed the seal of the Companies on this 5th day of December , 2025 .

Secretary

POA 0018 (5/25)

RIGHT OF WAY CONSTRUCTION BOND

No. DSP0003982

Applicant's Telephone Number: (425) 527-9830

KNOW ALL MEN BY THESE PRESENTS:

That (I), (We), Cascade Drilling, LP,

of 22722 29th Drive SE, Suite 228 (Street), Bothell, WA 98021 (City, State),

as Principal, and American Surety Company of

250 East 96th Street, Suite 202, Indianapolis, IN 46240,

as Surety, are held and firmly bound unto the City of Waterloo, Black Hawk County, Iowa, in the penal sum of TWENTY THOUSAND DOLLARS ($20,000.00) lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Principal herein firmly binds (himself) (herself) (themselves) their heirs, executors and administrators, and the said Surety binds themselves, their successors, assigns, executors and administrators, jointly and severally, firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SUCH that, by the provisions of the Ordinances of the City of Waterloo, Iowa, a Surety Bond in the sum of Twenty Thousand Dollars ($20,000.00) must be filed with the City Clerk/Auditor of the City of Waterloo, Iowa, before one may engage in construction, reconstruction or excavation in the public right of way in said City.

NOW, THEREFORE, if the above bounden Cascade Drilling, LP of 22722 29th Drive SE, Suite 228, Bothell, WA 98021 will faithfully perform any and all duties and abide by any and all regulations required by said Ordinances regulating the construction, reconstruction and excavation projects within said City; and if (he), (she), (they) will promptly pay to said City any and all sums and amounts due or that may become due or owing by reason of or under said Ordinances; and if (he), (she), (they) will pay all fines imposed upon (him), (her), (them), or a violation of said Ordinances occurring during the life of this bond; and if (he), (she), (they) will indemnify and keep the City harmless from all liability for any accident and/or damages arising from (his), (her), (their) doing, protecting or completing the work, then this obligation to be null and void, otherwise to remain in full force and effect.

The effective date of this Bond is August 17, 20 26, through April 30, 20 27.

Witness our hands this 17th day of August, 20 26.

Cascade Drilling, LP
PRINCIPAL
By: _____
Printed Name: Gary Crueger, ~~COO~~

American Insurance Company
SURETY
By: _____
Attorney-in-fact Melissa Haddick

PLEASE MAIL TO:

City of Waterloo, Iowa
Engineering Department
715 Mulberry Street
Waterloo, IA 50703

Updated 2-28-2023

PLEASE COMPLETE CHECKLIST ON REVERSE SIDE BEFORE SUBMITTING BOND.

Bond No.: DSP0003982

AMERICAN SURETY COMPANY
Administrative Office: 201 E. 5th Street, Cincinnati, Ohio 45202

The number of persons authorized by this power of attorney is not more than 7.

POWER OF ATTORNEY

Know All Men by These Presents: That **American Surety Company**, a corporation organized and existing under and by virtue of the laws of the State of Indiana, does hereby nominate, constitute, and appoint the person or persons named below, each individually if more than one is named, its true and lawful attorney-in-fact, for it and in its name, place and stead to execute on behalf of said Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; provided that the liability of the said Company on any such bond, undertaking or contract of suretyship executed under this authority shall not exceed the limit stated below.

Name	Address	Limit of Power
Sandra Parker, Melissa Haddick, Megan Sivley, Madison Diaz, Tannis Mattson, Rebecca J. Hobbs, Adina Williams	All of Houston, TX	$ 25,000,000.00

This Power of Attorney revokes all previous powers issued on behalf of the attorney(s)-in-fact named above.
IN WITNESS WHEREOF the **American Surety Company** has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this 7th day of October, 2024.

ATTEST:

By: _____
Robert Kuzloski, Secretary

SEAL

By: _____
Timothy D. Martin, President

STATE OF OHIO, COUNTY OF HAMILTON – ss:

On this 7th day of October, 2024 before me, personally appeared Timothy D. Martin, to me known, being duly sworn, deposes and says that he is the President of **American Surety Company**, the Company described in and which executed the above instrument; that he knows the seal of the said Company; that the seal affixed to the said instrument is such corporate seal; that it was so affixed by authority of his office under the By-Laws of said Company, and the he signed his name thereto by like authority.

PATRICK J DEMMER
Notary Public, State of Ohio
Commission #: 2023-RE-861396
My Commission Expires 03-20-28

_____
Patrick J. Dremmer, Notary Public
State of Ohio

This Power of Attorney is granted by authority of the following resolutions adopted by the Board of Directors of **American Surety Company** by unanimous written consent effective October 2, 2024.

RESOLVED: That the President be and hereby is authorized, from time to time, to appoint one or more Attorneys-in-Fact to execute on behalf of the Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; to prescribe their respective duties and the respective limits of their authority; and to revoke any such appointment at any time.

RESOLVED FURTHER: That the Company seal and the signature of the President and any Secretary or Assistant Secretary of the Company may be affixed by electronic means to any power of attorney or certificate of either given for the execution of any bond, undertaking, contract of suretyship, or other written obligation in the nature thereof, such signature and seal when so used being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

CERTIFICATION

I, Robert Kuzloski, Secretary of **American Surety Company**, do hereby certify that the foregoing Power of Attorney and the Resolutions of the Board of Directors effective October 2, 2024 have not been revoked and are now in full force and effect.

Signed and sealed this 17th day of August, 2026.

SEAL

_____
Robert Kuzloski, Secretary

This Power of Attorney is not effective unless a Bond Number or the word "Bid" is stated above.

PACW2000V1

RIGHT OF WAY CONSTRUCTION BOND

No. 7901114695

Applicant's Telephone Number: 319-830-6038

KNOW ALL MEN BY THESE PRESENTS:

That (I), (We), Mack Stanley dba Mack's Asphalt Maintenance,

of 920 Short St (Street), Waterloo (City), IA (State),

as Principal, and Nationwide Mutual Insurance Company of

1100 Locust Street, Department 2006, Des Moines, IA 50391,

as Surety, are held and firmly bound unto the City of Waterloo, Black Hawk County, Iowa, in the penal sum of TWENTY THOUSAND DOLLARS ($20,000.00) lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Principal herein firmly binds (himself) (herself) (themselves) their heirs, executors and administrators, and the said Surety binds themselves, their successors, assigns, executors and administrators, jointly and severally, firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SUCH that, by the provisions of the Ordinances of the City of Waterloo, Iowa, a Surety Bond in the sum of Twenty Thousand Dollars ($20,000.00) must be filed with the City Clerk/Auditor of the City of Waterloo, Iowa, before one may engage in construction, reconstruction or excavation in the public right of way in said City.

NOW, THEREFORE, if the above bounden Mack Stanley dba Mack's Asphalt Maintenance of 920 Short St , Waterloo, IA 50707 will faithfully perform any and all duties and abide by any and all regulations required by said Ordinances regulating the construction, reconstruction and excavation projects within said City; and if (he), (she), (they) will promptly pay to said City any and all sums and amounts due or that may become due or owing by reason of or under said Ordinances; and if (he), (she), (they) will pay all fines imposed upon (him), (her), (them), or a violation of said Ordinances occurring during the life of this bond; and if (he), (she), (they) will indemnify and keep the City harmless from all liability for any accident and/or damages arising from (his), (her), (their) doing, protecting or completing the work, then this obligation to be null and void, otherwise to remain in full force and effect.

The effective date of this Bond is May 1st, 2026, through April 30, 2027.

Witness our hands this 30th day of January, 2026.

Mack Stanley dba Mack's Asphalt Maintenance
PRINCIPAL

By: Mack Stanley

Printed Name: Mack Stanley

Nationwide Mutual Insurance Company
SURETY

By: _____
Attorney-in-fact

PLEASE MAIL TO:

City of Waterloo, Iowa
Engineering Department
715 Mulberry Street
Waterloo, IA 50703

Updated 2-28-2023

PLEASE COMPLETE CHECKLIST ON REVERSE SIDE BEFORE SUBMITTING BOND.

Bond Number: 7901114695

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:

Elizabeth Moore

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf on the date thereof any and all: (i)bonds and undertakings; (ii) Proposal Bonds; (ii) Letters of Surety; (iv) Consent of Surety; and (v) other obligatory instruments of similar nature, in penalties not exceeding the sum of

Twenty Thousand and No/100 Dollars ($20,000.00)

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company.

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 23rd day of October, 2025.

Antonio C. Albanese, **Vice President** of Nationwide Mutual Insurance Company

ACKNOWLEDGMENT

STATE OF OHIO COUNTY OF FRANKLIN: ss
On this 23rd day of October, 2025, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.

Karen L. Karn
Notary Public, State of Ohio
No. 2018-RE-719796
Commission Expires July 7, 2028

Notary Public
My Commission Expires
July 7, 2028

CERTIFICATE

I, Lezlie F. Chimienti, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this 30th day of January, 2026.

Assistant Secretary

BDJ 1(10-25)00

RIGHT OF WAY CONSTRUCTION BOND

No. 89023177
Applicant's Telephone Number: (319) 830-6176

KNOW ALL MEN BY THESE PRESENTS:

That (I), (We), Midwest Excavation and Trucking LLC,

of 21324 Spring Ave (Street), Clarksville, IA 50619 (City, State),
as Principal, and WESTERN SURETY COMPANY

of P.O. Box 5077, Sioux Falls, SD 57117-5077,
as Surety, are held and firmly bound unto the City of Waterloo, Black Hawk County, Iowa, in the penal sum of TWENTY THOUSAND DOLLARS ($20,000.00) lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Principal herein firmly binds (himself) (herself) (themselves) their heirs, executors and administrators, and the said Surety binds themselves, their successors, assigns, executors and administrators, jointly and severally, firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SUCH that, by the provisions of the Ordinances of the City of Waterloo, Iowa, a Surety Bond in the sum of Twenty Thousand Dollars ($20,000.00) must be filed with the City Clerk/Auditor of the City of Waterloo, Iowa, before one may engage in construction, reconstruction or excavation in the public right of way in said City.

NOW, THEREFORE, if the above bounden Midwest Excavation and Trucking LLC of

Clarksville, Iowa will faithfully perform any and all duties and abide by any and all regulations required by said Ordinances regulating the construction, reconstruction and excavation projects within said City; and if (he), (she), (they) will promptly pay to said City any and all sums and amounts due or that may become due or owing by reason of or under said Ordinances; and if (he), (she), (they) will pay all fines imposed upon (him), (her), (them), or a violation of said Ordinances occurring during the life of this bond; and if (he), (she), (they) will indemnify and keep the City harmless from all liability for any accident and/or damages arising from (his), (her), (their) doing, protecting or completing the work, then this obligation to be null and void, otherwise to remain in full force and effect.

The effective date of this Bond is August 24th, 2026, through April 30, 2027.

Witness our hands this 24th day of August, 2026.

PLEASE MAIL TO:

City of Waterloo, Iowa
Engineering Department
715 Mulberry Street
Waterloo, IA 50703

WESTERN SURETY COMPANY CORPORATE SEAL SIOUX FALLS SOUTH DAKOTA

Midwest Excavation and Trucking LLC
PRINCIPAL

By: Jared Ragsdale

Printed Name: Jared Ragsdale

WESTERN SURETY COMPANY
SURETY

By: Larry Kasten
Attorney-in-fact

Larry Kasten,
Vice President

Updated 2-28-2023

PLEASE COMPLETE CHECKLIST ON REVERSE SIDE BEFORE SUBMITTING BOND.

Western Surety Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS:

That WESTERN SURETY COMPANY, a corporation organized and existing under the laws of the State of South Dakota, and authorized and licensed to do business in the States of Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the United States of America, does hereby make, constitute and appoint

Larry Kasten of Sioux Falls, State of South Dakota, its regularly elected Vice President, as Attorney-in-Fact, with full power and authority hereby conferred upon him to sign, execute, acknowledge and deliver for and on its behalf as Surety and as its act and deed, the following bond:

One Right of Way Construction City of Waterloo

bond with bond number 89023177

for Midwest Excavation and Trucking LLC

as Principal in the penalty amount not to exceed: $ 20,000.00.

Western Surety Company further certifies that the following is a true and exact copy of Section 7 of the by-laws of Western Surety Company duly adopted and now in force, to-wit:

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys-in-Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

This Power of Attorney may be signed by digital signature and sealed by a digital or otherwise electronic-formatted corporate seal under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 27th day of April, 2022:

"RESOLVED: That it is in the best interest of the Company to periodically ratify and confirm any corporate documents signed by digital signatures and to ratify and confirm the use of a digital or otherwise electronic-formatted corporate seal, each to be considered the act and deed of the Company."

In Witness Whereof, the said WESTERN SURETY COMPANY has caused these presents to be executed by its Vice President with the corporate seal affixed this 24th day of August, 2026.

ATTEST

L. Bauder, Assistant Secretary

WESTERN SURETY COMPANY

By

Larry Kasten, Vice President

STATE OF SOUTH DAKOTA } ss
COUNTY OF MINNEHAHA }

On this 24th day of August, 2026, before me, a Notary Public, personally appeared Larry Kasten and L. Bauder who, being by me duly sworn, acknowledged that they signed the above Power of Attorney as Vice President and Assistant Secretary, respectively, of the said WESTERN SURETY COMPANY, and acknowledged said instrument to be the voluntary act and deed of said Corporation.

P. DAHL
NOTARY PUBLIC
SOUTH DAKOTA

My Commission Expires June 18, 2031

Notary Public

To validate bond authenticity, go to www.cnasurety.com > Owner/Obligee Services > Validate Bond Coverage.

Form F9701-1-2026

RIGHT OF WAY CONSTRUCTION BOND

No. 2383786

Applicant's Telephone Number: (563) 924-3115

KNOW ALL MEN BY THESE PRESENTS:

That (I), (We), Summers' Enterprise, Inc.,

of 1776 Buchanan-Delaware Avenue (Street), Masonville, IA 50654 (City, State),

as Principal, and Swiss Re Corporate Solutions America Insurance Corporation of

1200 Main Street, Suite 800, Kansas City, MO 64105-2478,

as Surety, are held and firmly bound unto the City of Waterloo, Black Hawk County, Iowa, in the penal sum of TWENTY THOUSAND DOLLARS ($20,000.00) lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Principal herein firmly binds (himself) (herself) (themselves) their heirs, executors and administrators, and the said Surety binds themselves, their successors, assigns, executors and administrators, jointly and severally, firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SUCH that, by the provisions of the Ordinances of the City of Waterloo, Iowa, a Surety Bond in the sum of Twenty Thousand Dollars ($20,000.00) must be filed with the City Clerk/Auditor of the City of Waterloo, Iowa, before one may engage in construction, reconstruction or excavation in the public right of way in said City.

NOW, THEREFORE, if the above bounden Summers' Enterprise, Inc. of 1776 Buchanan-Delaware Avenue, Masonville, IA 50654 will faithfully perform any and all duties and abide by any and all regulations required by said Ordinances regulating the construction, reconstruction and excavation projects within said City; and if (he), (she), (they) will promptly pay to said City any and all sums and amounts due or that may become due or owing by reason of or under said Ordinances; and if (he), (she), (they) will pay all fines imposed upon (him), (her), (them), or a violation of said Ordinances occurring during the life of this bond; and if (he), (she), (they) will indemnify and keep the City harmless from all liability for any accident and/or damages arising from (his), (her), (their) doing, protecting or completing the work, then this obligation to be null and void, otherwise to remain in full force and effect.

The effective date of this Bond is August 19, 2026, through April 30, 2027.

Witness our hands this 19th day of August, 2026.

Summers' Enterprise, Inc.
PRINCIPAL
By: Rachel Summers
Printed Name: Rachel Summers

Swiss Re Corporate Solutions America Insurance Corporation
SURETY
By: Jamie Mford
Attorney-in-fact Jamie Gifford

PLEASE MAIL TO:

City of Waterloo, Iowa
Engineering Department
715 Mulberry Street
Waterloo, IA 50703

Updated 2-28-2023

PLEASE COMPLETE CHECKLIST ON REVERSE SIDE BEFORE SUBMITTING BOND.

SWISS RE CORPORATE SOLUTIONS

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION ("SRCSAIC")
SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION ("SRCSPIC")
WESTPORT INSURANCE CORPORATION ("WIC")

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT SRCSAIC, a corporation duly organized and existing under laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute, and appoint:

JAY D. FREIERMUTH, CRAIG E. HANSEN, BRIAN M. DEIMERLY, ANNE CROWNER, TIM MCGULLOH, DIONE R. YOUNG, SETH ROOKER, JENNIFER MARINO,

JOSEPH TIERNAN, KATE ZANDERS, SARA HUSTON, JOHN CORD, GRACE DICKINSON, CAMERON BURT, BEN WILLIAMS, JAMIE GIFFORD and ZACH FULLER

JOINTLY OR SEVERALLY

Its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds, consents of surety, or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

ONE HUNDRED TWENTY FIVE MILLION ($125,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both SRCSAIC and SRCSPIC at meetings duly called and held on the 18th of November 2021 and WIC by written consent of its Executive Committee dated July 18, 2011:

"RESOLVED, that any two of the President, any Managing Director, any Senior Vice President, any Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is, authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Corporation bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Corporation; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Corporation may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

By _____
David Satory, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

By _____
Gabriel Jacquez, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

IN WITNESS WHEREOF, SRCSAIC have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers this 11th day of June, 20 25.

Swiss Re Corporate Solutions America Insurance Corporation
Swiss Re Corporate Solutions Premier Insurance Corporation
Westport Insurance Corporation

State of Illinois
County of Cook ss

On this 11th day of June, 20 25, before me, a Notary Public personally appeared David Satory, Senior Vice President of SRCSAIC and Senior Vice President of SRCSPIC and Senior Vice President of WIC, and Gabriel Jacquez, Senior Vice President of SRCSAIC and Senior Vice President o SRCSPIC and Senior Vice President of WIC, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.

OFFICIAL SEAL
KAREN M SZWEDA
Notary Public, State of Illinois
Commission No 978628
My Commission Expires September 26 2027

Karen M. Szweda, Notary

I, Jeffrey Goldberg, the duly elected Senior Vice President and Assistant Secretary of SRCSAIC and SRCSPIC and WIC do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said SRCSAIC and SRCSPIC and WIC, which is still in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 19th day of August, 20 26.

Jeffrey Goldberg, Senior Vice President & Assistant Secretary of SRCSAIC and SRCSPIC and WIC

RIGHT OF WAY CONSTRUCTION BOND

No. 190058699

Applicant's Telephone Number: (515) 576-1118

KNOW ALL MEN BY THESE PRESENTS:

That (I), (We), Woodruff Construction, Inc.,

of 1890 Kountry Lane (Street), Fort Dodge, IA 50501 (City, State),

as Principal, and Liberty Mutual Insurance Company of

175 Berkeley Street, Boston, MA 02116,

as Surety, are held and firmly bound unto the City of Waterloo, Black Hawk County, Iowa, in the penal sum of TWENTY THOUSAND DOLLARS ($20,000.00) lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Principal herein firmly binds (himself) (herself) (themselves) their heirs, executors and administrators, and the said Surety binds themselves, their successors, assigns, executors and administrators, jointly and severally, firmly by these presents.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SUCH that, by the provisions of the Ordinances of the City of Waterloo, Iowa, a Surety Bond in the sum of Twenty Thousand Dollars ($20,000.00) must be filed with the City Clerk/Auditor of the City of Waterloo, Iowa, before one may engage in construction, reconstruction or excavation in the public right of way in said City.

NOW, THEREFORE, if the above bounden Woodruff Construction, Inc. of 1890 Kountry Lane, Fort Dodge, IA 50501 will faithfully perform any and all duties and abide by any and all regulations required by said Ordinances regulating the construction, reconstruction and excavation projects within said City; and if (he), (she), (they) will promptly pay to said City any and all sums and amounts due or that may become due or owing by reason of or under said Ordinances; and if (he), (she), (they) will pay all fines imposed upon (him), (her), (them), or a violation of said Ordinances occurring during the life of this bond; and if (he), (she), (they) will indemnify and keep the City harmless from all liability for any accident and/or damages arising from (his), (her), (their) doing, protecting or completing the work, then this obligation to be null and void, otherwise to remain in full force and effect.

The effective date of this Bond is August 26, 2026, through April 30, 2027.

Witness our hands this 26th day of August, 2026.

Woodruff Construction, Inc.
PRINCIPAL

By: _____

Printed Name: John Mallen

PLEASE MAIL TO:

City of Waterloo, Iowa
Engineering Department
715 Mulberry Street
Waterloo, IA 50703

Liberty Mutual Insurance Company
SURETY

By: _____
Attorney-in-fact Sara Huston

Updated 2-28-2023

PLEASE COMPLETE CHECKLIST ON REVERSE SIDE BEFORE SUBMITTING BOND.

POWER OF ATTORNEY

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: 8213828-190056

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Anne Crowner; Brian M. Deimerly; Craig E. Hansen; Dione R. Young; Grace Dickinson; Jamie Gifford; Jay D. Freiermuth; John Cord; Kate Zanders; Sara Huston; Seth D. Rooker; Tim McCulloh; Zachary R. Fuller

all of the city of Waukee state of IA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 16th day of April, 2025.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: _____
Nathan J. Zangerle, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 16th day of April, 2025 before me personally appeared Nathan J. Zangerle, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2029
Commission number 1126044
Member, Pennsylvania Association of Notaries

By: _____
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Nathan J. Zangerle, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 26th day of August, 2026.

By: _____
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.

LMS-12873 LMIC OCIC WAIC Multi Co 02/24

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Noel Anderson, Community Planning and Development Director
Planning & Zoning Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Asbestos Abatement Services, Contract AB-2026-08-06P.

RECOMMENDED COUNCIL ACTION

approval

SUMMARY STATEMENT AND BACKGROUND INFORMATION

The properties in question are six homes, including 321 Dearborn Av, 521 Pine St, 314 Reber Av, 1410 Mulberry St, 420 Bayard St, and 623 N Barclay St. The properties have been acquired by the City (primarily through 657A court action), and are being abated of asbestos in preparation of demolition.

NEIGHBORHOOD IMPACT

The action is in preparation for demolition, which will remove blighted buildings from neighborhoods.

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

Estimate: $40,000. To be paid from Nuisance Abatement bonds and/or TIF funds.

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Bid Tabulation Asbestos Abatement Services Contract AB-2026-08-06P
2. Asbestos Abatement Services Contract AB-2026-08-06P Contractor signed
3. RFB Asbestos Abatement Services Contract AB-2026-08-06P
4. Exhibit C Asbestos Abatement Services Contract AB-2026-08-06P
5. 321 Dearborn Av Report AS-2026-06-04P 7.14.26
6. 521 Pine St Report AS-2026-06-04P 7.20.26
7. 314 Reber Av Report AS-2026-06-04P 7.20.26
8. 1410 Mulberry St Report AS-2026-06-04P 7.16.26
9. 420 Bayard St AS-2026-01-04P
10. 623 N Barclay St AS-2026-01-04P

Asbestos Abatement Services, Contract AB-2026-08-06P

Engineer's Estimate $40,000.00

August 27, 2026

Bidder	Bid Security	Bid Amount
ADVANCED ENVIRONMENTAL, WATERLOO, IOWA	5%	$37,200.00
ALL STAR ENVIRONMENTAL, LLC DUBUQUE, IOWA	5%	$29,830.00
SITE SERVICES, INC. ALGONA, IOWA	5%	$30,770.00

ASBESTOS ABATEMENT SERVICES CONTRACT #AB-2026-08-06P

321 Dearborn Avenue, 521 Pine Street, 314 Reber Avenue, 1410 Mulberry Street, 420 Bayard Street, and 623 N Barclay Street.

This Contract for Asbestos Abatement Services (the "Contract") is entered into as of September 8, 2026, by and between the City of Waterloo, Iowa ("City") and All Star Environmental, LLC. In consideration of the mutual promises exchanged herein, the parties agree as follows:

1. Term and Services. For the period of September 21, 2026 thru November 20, 2026, subject to extension upon the mutual written agreement of the parties, the Contractor agrees to furnish all tools, labor and materials, and perform and substantially complete all work within the time period stated in the specifications after receipt of Notice to Proceed with respect to a given property or set of properties. By executing this Contract, Contractor certifies that it holds an asbestos permit issued by the Iowa Division of Labor and that all personnel who perform work on the project will have an asbestos license issued by the Iowa Division of Labor. Contractor agrees that such permit and licenses will be maintained during the term of this Contract. Work to be performed includes all work described in the Contract Documents (defined below).

Contractor shall provide the above services at the cost set forth in the Contractor's RFB response. Contractor's request for payment for services authorized under this Contract shall be submitted in accordance with the Contract Documents and will be paid within forty-five (45) days after receipt of an original invoice and after such services are delivered and accepted and all necessary supporting documentation is submitted. Contractor will be paid for all items satisfactorily completed. Such payment will be full compensation for asbestos removal and disposal, for all permits, licenses, inspections, for complying with all laws, rules, regulations and ordinances, including safety, and for furnishing all materials, equipment and labor to complete the work in accordance with the plans and specifications.

2. Contract Documents. The following documents (collectively, the "Contract Documents") are hereby incorporated by reference as though set forth herein in full:

a. Request for Bid
b. Addenda (if any)
c. Response (Proposal) from the Contractor

In the event of conflict between the provisions of the Contract Documents and this Contract, the provisions of this Contract shall prevail.

2.1 Contract Limits. Total actual expenses allowed by the project Contract, including any renewal extensions of the Contract, shall not exceed **$29,830** as provided in the Bid

Tabulation that is part of Contractor's RFB Response referenced in Section 2.c above, except by written amendment as provided herein.

3. Approval; Timing of Work. Contractor shall not begin work until after the Contract has been approved by the City Council and the Contractor has been issued a Notice to Proceed. The work shall commence within ten (10) days after the City has issued a Notice to Proceed with respect to any particular property or set of properties, and all work shall be completed and delivered within the term of the Contract, including any renewal extensions.

4. Performance Bond. Contractor will be required to furnish bond in an amount equal to one hundred percent (100%) of the Contract price and shall be issued by a responsible surety acceptable to the City. The bond shall guarantee the faithful performance of the Contract and the terms and conditions therein contained, shall guarantee the prompt payment of all materials and labor and protect and save harmless the City from claims and damages of any kind arising out of the performance of this Contract..

5. Reporting; Records. Contractor shall exercise best efforts to maintain communication with City personnel whose involvement in the project is necessary or advisable for successful and timely completion of the work of the project. Communications between the parties shall be verbal or in writing, as requested by the parties or as dictated by the subject matter to be addressed. Contractor shall maintain all project records for a minimum period of three (3) years after the date of final payment for services rendered under this Contract. During the term of this Contract and for the ensuing record-retention period, Contractor shall make any or all project records available upon reasonable request, and in any event within two (2) business days of request, to City, and any other agency of state or federal government. For purposes of this section, "records" means any and all books, documents, papers and records of any type or nature that are directly pertinent to this Contract. Contractor agrees to furnish, upon termination of this Contract and upon demand by the City, copies of all basic notes and sketches, charts, computations, and any other data prepared or obtained by the Contractor pursuant to this Contract, without cost and without restrictions or limitation as to the use relative to specific projects covered under this Contract. In such event, the Contractor shall not be liable for the City's use of such documents on other projects.

6. Reserved.

7. Indemnity. Except as to any negligence of City, its officials, officers, employees, agents, or elected officials, in the performance of any duty under this Contract, and to the extent not covered by insurance maintained by Contractor, Contractor agrees to defend and indemnify City, its officials, officers, employees, agents and elected officials, and to hold same harmless, from and against any and all claims, demands, causes of action, losses, costs, or liabilities whatsoever, including but not limited to reasonable attorneys' fees and expenses, arising from or in connection with the acts or omissions of Contractor in providing the services contemplated by this Contract. This will include but is not limited to actions or suits based upon or alleging bodily injury, including death, or property damage rising out of or resulting from the Contractor's operation under this Contract, whether by itself or by any subcontractor or anyone directly or indirectly employed by any of them. Contractor is not and shall not be deemed an agent or employee of the City.

8. Default; Termination for Cause. In the event that Contractor defaults in the performance or observance of any covenant, agreement or obligation set forth in this Contract, and if such default remains uncured for a period of seven (7) days after notice thereof shall have been given by City to Contractor (or for a period of fourteen (14) days after such notice if such default is curable but requires acts to be done or conditions to be remedied which, by their nature, cannot be done or remedied within such 14-day period and thereafter Contractor fails to diligently and continuously prosecute the same to completion within such 14-day period), then City may declare that Contractor is in default hereunder and may take any one or more of the following steps, at its option:

a. by mandamus or other suit, action or proceeding at law or in equity, require Contractor to perform its obligations and covenants hereunder, or enjoin any acts or things which may be unlawful or in violation of the rights of the City hereunder, or obtain damages caused to the City by any such default;

b. have access to and inspect, examine and make copies of all books and records of Contractor which pertain to the project;

c. declare a default of this Contract, make no further disbursements, and demand immediate repayment from Contractor of any funds previously disbursed under this Contract;

d. terminate this Contract by delivery to Contractor of written notice of termination; and/or

e. take whatever other action at law or in equity may be necessary or desirable to enforce the obligations and covenants of Contractor hereunder, including but not limited to the recovery of funds.

No delay in enforcing the provisions hereof as to any breach or violation shall impair, damage or waive the right of City to enforce the same or to obtain relief against or recover for the continuation or repetition of such breach or violation or any similar breach or violation thereof at any later time or times. In the event that City prevails against Contractor in a suit or other enforcement action hereunder, Contractor agrees to pay the reasonable attorneys' fees and expenses incurred by City.

9. Termination for Convenience. This Contract may be terminated at any time, in whole or in part, upon the mutual written agreement of the parties. City may also choose to terminate this Contract at any time by delivering to Contractor 10-days' advance written notice of intent to terminate.

10. Non-Assignable Duties. Contractor may not assign its duties hereunder without the prior written consent of City.

11. Independent Contractor. Contractor is an independent contractor and is not an employee, servant, agent, partner, or joint venturer of City. Contractor has no power or authority to enter into contracts or agreements on behalf of City. City shall determine the work to be done by Contractor, but Contractor shall determine the legal means by which it performs the work specified by City. City is not responsible for withholding, and shall not withhold, FICA or taxes

of any kind from any payments which it owes Contractor. Neither Contractor nor its employees, if any, shall be entitled to receive any benefits which employees of City are entitled to receive and shall not be entitled to workers' compensation, unemployment compensation, medical insurance, life insurance, pension, or any benefits of any type or nature whatsoever on account of their work for City. Contractor shall be solely responsible for compensating its employees, if any.

12. Anti-Discrimination. During the performance of this Contract, Contractor, for itself, its assignees and successors in interest, agrees to comply with the anti-discrimination laws of the State of Iowa, as contained in Sections 19B, 551.4 of the Code of Iowa, which are herein incorporated by reference and made a part of this Contract.

13. Severability. In the event any provision of this Contract, together with the Contract Documents, is held invalid, illegal, or unenforceable, whether in whole or in part, the remaining provisions of this Contract shall not be affected thereby and shall continue in full force and effect. If, for any reason, a court finds that any provision of this Contract is invalid, illegal, or unenforceable as written, but that by limiting such provision it would become valid, legal, and enforceable, then such provision shall be deemed to be written and shall be construed and enforced as so limited.

14. General Terms. This Contract, together with the Contract Documents, constitutes the entire agreement between the parties pertaining to the subject matter hereof. This Contract may not be modified or amended except pursuant to the mutual written agreement of the parties. This Contract is binding on the parties and the heirs, personal representatives, successor and assigns of each. Time is of the essence in the performance of the terms hereof.

IN WITNESS WHEREOF, the parties have executed this Contract for Asbestos Abatement Services as of the date first set forth above.

CITY OF WATERLOO, IOWA

By: _____
David Boesen, Mayor

Attest: _____
Kelly Felchle, City Clerk

ALL STAR ENVIRONMENTAL, LLC

_____
Bruce Pregler

CITY OF WATERLOO, IOWA

Request for Bid

ASBESTOS ABATEMENT SERVICES

August 2026

Asbestos Abatement Services Contract AB-2026-08-06P

321 Dearborn Av, 521 Pine St, 314 Reber Av, 1410 Mulberry St,
420 Bayard St, and 623 N Barclay St

City of Waterloo, Iowa

Prepared by the City of Waterloo Planning and Zoning Department
Aric Schroeder-Project Manager

SECTION I
NOTICE OF REQUEST FOR BID

1.0 Receipt and Opening of Bid
The City of Waterloo is seeking sealed bids for asbestos abatement services **Contract AB-2026-08-06P – 321 Dearborn Av, 521 Pine St, 314 Reber Av, 1410 Mulberry St, 420 Bayard St, and 623 N Barclay St.**

All bids must be received in a sealed envelope in the City Clerk's Office, Waterloo City Hall, 715 Mulberry Street, Waterloo, IA 50703 (date and time stamped) by Thursday August 27, 2026 at 1:00 p.m. (our clock), Central Time, in order to be considered. City Hall is located at 715 Mulberry Street, Waterloo, Iowa. Bids sent electronically or via facsimile will not be accepted. The mailing container should be marked as noted below, and include the name of the company submitting the bid.

1.1 RFB Timeline

Name of the Bid:	Asbestos Abatement Services Contract AB-2026-08-06P
Notice of RFB Date:	August 6, 2026
Mandatory Walk Thru:	**There will not be a mandatory walk thru.** Bidders are advised/encouraged to make their own inspections prior to bid submittal. See Section 4.5 for additional details.
Deadline for Bid Submittal:	**Thursday, August 27, 2026 at 1:00 p.m., Central Time**
Submit Sealed Bid to:	Address exactly as stated: SEALED RFB FOR ASBESTOS ABATEMENT SERVICES CONTRACT AB-2026-08-06P City of Waterloo City Clerk's Office 715 Mulberry Street Waterloo, IA 50703
Method of Submittal:	Mail or Overnight Delivery, In Person (**No** Electronic or Fax Submittals)
Contact Person, Title: **E-mail Address**:	Aric Schroeder, City Planner/Project Manager (City's Representative) aric.schroeder@waterloo-ia.org
Phone:	Phone: 319-291-4366

1.2 The City reserves the right to accept or reject any or all proposals and to waive any informalities or irregularities in proposals if such waiver does not substantially change the offer or provide a competitive advantage to any Bidder. The City reserves the right to defer acceptance of any bid for a period not to exceed sixty (60) calendar days from the date of the deadline for receiving bids.

1.3 The City is not responsible for delays occasioned by the U.S. Postal Service, the internal mail delivery system of the City, or any other means of delivery employed by the Proposer. Similarly, the City is not responsible for, and will not open, any proposal responses that are received later than the date and time stated above. Late proposals will be retained in the RFB

file, unopened. No responsibility will be attached to any person for premature opening of a proposal not properly identified.

1.4 **Bids will be opened on Thursday, August 27, 2025, at 1:00 pm (our clock) Central Time in the second floor Council Chambers and will be streamed live on the City of Waterloo's YouTube Channel.** The main purpose of this opening is to reveal the name(s) of the Bidder(s), not to serve as a forum for determining the award. **The awarding of the contract could be as early as the City Council meeting on Tuesday, August 8, 2026 at 5:30 p.m.** Proposals will be evaluated promptly after opening. After an award is made, a proposal summary will be sent to all companies who submitted a proposal. Proposal results will not be given over the telephone. Proposals may be withdrawn anytime prior to the scheduled closing time for receipt of proposals; no proposal may be modified or withdrawn for a period of sixty (60) calendar days thereafter.

SECTION II
INSTRUCTIONS TO BIDDERS

2.0 The Bid shall include the attached Exhibit "A" signature page, properly completed. A company representative who is authorized to bind the company will sign on behalf of the company to indicate to the City that you have read all provisions of the RFB and agree to all terms and conditions, except as provided in paragraph 2.4 below. The City of Waterloo reserves the right to reject any or all bids, and to accept in whole or in part, the bid, which, in the judgment of the proposal evaluators, is the most responsive and responsible bid, that offers the greatest value to the City with regard to the criteria detailed and the specifications set forth herein. The City will select a Bidder based on knowledge of experience and qualifications, and past experience with Bidder, cost will not be the sole determining factor. A Bidder's submittal of a bid constitutes its acceptance of this evaluation technique and its recognition and acceptance that subjective judgments will be used in the evaluation. Evaluation criteria may include, but are not limited to:

i. Satisfactory experience in the timely completion of work;
ii. Bidder's reputation and financial status;
iii. Past experience and service provided by the Bidder;
iv. Bidder's ability to meet the insurance and bonding requirements; and
v. Bidders ability to immediately fully staff the project with certified, licensed staff.

2.1 General Liability Insurance with limits of liability of at least $1,000,000 per occurrence and $2,000,000 general aggregate combined single limit, for Personal Injury, Bodily Injury and Property Damage is required. At a minimum, coverage for Premises, Operations, Products and Completed Operations shall be included. This coverage shall protect the public or any person from injury or property damages sustained by reason of the contractor or its employees carrying out their work. The Contractor shall provide certificate of insurance having the City of Waterloo as additional insured. Also required is Pollution Liability Insurance, which shall be True Occurrence, not Claims Made. The Contractor shall obtain and maintain coverage for claims arising from bodily injury, property damage, and the use of owned, hired, or leased autos. The insurance shall cover all asbestos and hazardous materials liability aspects of the project, including the project site, during transportation from the project site to the disposal site, and during unloading operations at the disposal site. Additionally, coverage shall include all costs of the cleanup of any releases to the environment of any asbestos-containing materials or hazardous materials during project abatement, and transportation for disposal. Such coverage shall have limits of no less than $1,000,000 per occurrence and $2,000,000 per project aggregate.

2.2 A bid guarantee from each Bidder equivalent to five percent (5%) of the bid price is required. The bid guarantee shall consist of a firm commitment, such as a bid bond, certified check, or other negotiable instrument acceptable to the City, as assurance that the Bidder will, upon acceptance of its bid, execute such contractual documents as may be required within the time specified.

The successful Bidder will be required to furnish a bond in an amount equal to one hundred percent (100%) of the Contract price and shall be issued by a responsible surety acceptable to the City. The bond shall guarantee the faithful performance of the Contract and the terms and conditions therein contained, shall guarantee the prompt payment of all materials and labor and protect and save harmless the City from claims and damages of any kind arising out of the performance of the Contract.

2.3 This Request for Bid does not commit the City to make an award, nor will the City pay any costs incurred in the preparation and submission of bids, or costs incurred in making necessary studies for the preparation of bids.

2.4 Important Exceptions to Contract Documents - The Bidder shall clearly state in the submitted bid any exceptions to, or deviations from, the minimum bid requirements, and any exceptions to the terms and conditions of this RFB. Such exceptions or deviations will be considered in evaluating the bids. Any exceptions should be noted on the Signature Page. Companies are cautioned that exceptions taken to this RFB may cause their bid to be rejected. No additional exceptions shall be allowed after submittal of a bid.

2.5 Incomplete Information - Failure to complete or provide any of the information requested in this RFB, and/or additional information as indicated, may result in disqualification by reason of "non responsiveness".

2.6 The Bidder hereby agrees to conform with all provisions of the Federal Civil Rights Act; The Code of Iowa, Chapter 216 Civil Rights Commissions rules and regulations; and conform to provisions set for in Iowa Code 692A.11. The Bidder certifies that they are permitted by the Iowa Workforce Development to conduct asbestos abatement in the State of Iowa. The Bidder hereby agrees that they will comply with all federal and state affirmative action/equal employment opportunity requirements concerning fair employment and will not discriminate between or among by reason of race, color, religion, sex, national origin, or physical handicap. The Bidder hereby agrees that they will make any and all supervisors and workers assigned to duties on the project for which this bid has been submitted aware of their duties under the Contract Documents, including these Project Specifications, and other documents presented as part of this project and all federal, state, and local laws and regulations.

2.7. The Bidder shall call to the City's attention, prior to signing a contract, any omissions or errors noted in the Specifications or Scope of Work that are at odds with the intent of the bid documents, the project, or any federal, state, or local laws or regulations. The Bidder, by submitting a bid and bid security, acknowledges that they forfeit the bid security upon failure to enter into such contract.

SECTION III
SPECIAL TERMS AND CONDITIONS

3.0 Term of Contract

3.0.1 The initial term of the Contract shall be for approximately two (2) months anticipated to begin September 21, 2026, to November 20, 2026.

3.0.2 The City and the Contractor may renew the original Contract for one (1) week time periods by mutual agreement. Two (2) week's notice must be given to renew the Contract for additional increments. City's Project Manager may administratively approve up to four (4) one (1) week time period renewals. Further renewals will require approval of the City Council as an amendment to the Contract.

3.0.3 A Contract, approved by the City Council and signed by the Mayor, shall become the document that authorizes the Contract to begin, assuming the insurance and bond requirements have been met. Each section contained herein, any addenda and the response (Bid) from the successful bidder, and all exhibits to the RFB shall also be incorporated by reference into the resulting Contract.

3.0.4 No price escalation will be allowed during the initial term of the Contract. If it is mutually decided to renew beyond the initial period and the Contractor requests a price increase, the Contractor shall provide documentation on the requested increase. The City reserves the right to accept or reject price increases, to negotiate more favorable terms, or to terminate (or allow to expire) without cost, the future performance of the Contract.

3.0.5 The total actual expenses shall not exceed the amount allowed by the project Contract, including any renewal extensions thereof, unless amended by written agreement.

3.1 Agreement Forms

3.1.1 After award, the Bidder will be required to enter into a written contract with the City that is substantially in the form attached hereto as Exhibit "C".

3.1.2. Termination for Cause. In the event that Contractor defaults in the performance or observance of any covenant, agreement or obligation set forth in the Contract, and if such default remains uncured for a period of seven (7) days after notice thereof shall have been given by City to Contractor (or for a period of fourteen (14) days after such notice if such default is curable but requires acts to be done or conditions to be remedied which, by their nature, cannot be done or remedied within such 14-day period and thereafter Contractor fails to diligently and continuously prosecute the same to completion within such 14-day period), then City may declare that Contractor is in default under the Contract.

3.1.3 Termination for Convenience. The Contract may be terminated at any time, in whole or in part, upon the mutual written agreement of the parties. City may also choose to terminate the Contract at any time by delivering to Contractor 10-days' advance written notice of intent to terminate.

3.1.4 Remedies. If Contractor is in default of the Contract and has not cured said default as set forth in Section 3.1.2 above, the City may take any one or more of the following steps, at its option:

3.1.4.1 by mandamus or other suit, action or proceeding at law or in equity, require Contractor to perform its obligations and covenants under the Contract, or enjoin any acts or things which may be unlawful or in violation of the rights of the City under the Contract, or obtain damages caused to the City by any such default;

3.1.4.2 have access to and inspect, examine and make copies of all books and records of Contractor which pertain to the project;

3.1.4.3 declare a default of the Contract, make no further disbursements, and demand immediate repayment from Contractor of any funds previously disbursed under the Contract;

3.1.4.4 terminate the Contract by delivering to Contractor a written notice of termination; and/or

3.1.4.5 take whatever other action at law or in equity may be necessary or desirable to enforce the obligations and covenants of Contractor under the Contract, including but not limited to the recovery of funds.

3.1.4.6 No delay in enforcing the provisions hereof as to any breach or violation shall impair, damage or waive the right of City to enforce the same or to obtain relief against or recover for the continuation or repetition of such breach or violation or any similar breach or violation thereof at any later time or times. In the event that City prevails against Contractor in a suit or other enforcement action under the Contract, Contractor agrees to pay the reasonable attorneys' fees and expenses incurred by City.

3.2 Terms of Payment

3.2.1 Invoices for services authorized under this Contract shall be submitted as "lump sum" after services are delivered and accepted, although the city may, at the city's sole option, provide partial payment for partial work completed.

3.2.2 For accounting purposes, all invoices shall contain a sufficient level of detail regarding all services provided and allowable expenses incurred, and be submitted to the City with supporting documentation by e-mail or US mail to: **Attn: City of Waterloo Planning and Zoning Department, 715 Mulberry Street, Waterloo, IA 50703**.

3.2.3 City has the right, at its discretion, to deny payment for any work by any Contractor if the total actual expenses exceed the amount allowed by the project Contract, including any renewal extensions thereof. The Contractor is not obligated to continue performance of services under this Agreement or otherwise incur costs in excess of the total actual expense allowed unless an amendment to the Contract is approved, and the City notifies the Contractor, in a written amendment, of the City's acceptance of the revised total actual expense allowed.

3.2.4 All work is to be done in strict compliance with this RFB. The City may withhold payment for reasons including, but not limited to, the following: unsatisfactory job performance or progress, defective work, disputed work, failure to comply with material provisions of the Contract, third party claims filed or reasonable evidence that a claim will be filed or other reasonable cause.

SECTION IV
SERVICE REQUIREMENTS

4.0 Background

The City of Waterloo, Iowa, is seeking proposals for asbestos abatement services for: **321 Dearborn Av, 521 Pine St, 314 Reber Av, 1410 Mulberry St, 420 Bayard St, and 623 N Barclay St**.

4.1 Scope of Work

The City of Waterloo is seeking a qualified asbestos abatement contractor to remove asbestos containing material (ACM). Bidder shall be responsible to familiarize itself with the specifications included in this RFB and to make a personal examination of the job site(s) and the physical conditions that may affect its bidding and performance under the Contract.

The services to be performed under this Contract shall consist of the following:

4.1.1 All services must be performed in accordance with all applicable codes and ordinances of the City of Waterloo, Iowa, accepted professional standards and best practices, as well as all applicable Federal and State regulations, including but not limited to asbestos Statutes and Rules (published by the Iowa Division of Labor), 40 CFR Part

61, National Emissions Standards for Hazardous Air Pollutants (NESHAP), as well as applicable State regulations of the Iowa Department of Natural Resources. The Contractor shall hold and maintain an asbestos permit issued by the Iowa Division of Labor, and all personnel who perform work on the Project shall hold and maintain an Iowa asbestos license issued by the Iowa Division of Labor.

4.1.2 Remove ACM as identified in the asbestos surveys included as Exhibit "B". Assess and reasonably ascertain if there is any ACM that was not identified in the asbestos surveys included as Exhibit "B". Removal of any non-identified ACM will be done by change order amendment to the Contract. Costs associated with this Contract shall be "lump sum". If the abatement Contractor requires additional inspection and testing, if it is based on it being missed by the survey contractor or not sufficiently identified by the survey contractor (as determined by the City's Representative), then the costs associated with the additional inspection and testing shall not be the responsibility of the abatement Contractor. However, if the re-inspection(s) and testing are required for failure of the asbestos abatement Contractor to remove all ACM, and missed ACM was clearly identified in the survey (as determined by the City's Representative), the abatement Contractor shall be responsible for payment to the survey contractor for any reinspection and testing fees as part of the "lump sum" costs of this Contract.

4.1.3 Document amounts of ACM removed from each structure.

4.1.4 Document ACM disposal at the Black Hawk County landfill through the use of landfill tickets and provide copies to the City's Project Manager upon request.

4.1.5 At the request of the City given with reasonable advance notice, attend meetings of the City relative to the work set forth in this Agreement.

4.1.6 Provide other services as requested by the City as may be necessary to implement the asbestos abatement project.

4.1.7 Provide clearance certification that the structure(s) are clear of ACM and ready for demolition.

The Contractor shall investigate the environmental condition, including the presence, location, and condition of ACM. Any failure of the Contractor to acquaint themselves with available information will not relieve them from the responsibility for determining the difficulty or cost of successfully performing the work. No increase in Contract cost will be considered due to the Bidder's failure to physically verify all site attributes affecting the work, or other materials specified by the Contract Documents. The City is not responsible for any conclusions or interpretations made by the Bidder on the basis of the information made available by the City. The Contractor may have to demolish materials to gain access to some ACM. These items may include, but are not limited to interior walls (consisting of wood paneling, tile, block, drywall, plaster, brick, non-structural concrete, etc.), ceiling and floor demolition (acoustical ceiling tile, grid, electrical wiring, piping, glue pods and/or glued on ceiling tiles, floor tiles or other flooring, mechanical items, etc.); cabinets, shelves, dividers/cubicles/desks, furniture, piping, utilities, base boards, built-up roofing, etc.

4.2 Silence of Specifications – Commercially accepted practices shall apply to any detail not covered in this specification and to any omission of this specification. Any omission or question of interpretation of the specification that affects the performance or integrity of the service being offered shall be addressed in writing and submitted with the Proposal.

4.3 The contractor that conducted asbestos surveys is eligible to perform asbestos abatement on the same properties, and therefore is eligible to bid on this RFB.

4.4 The Contractor shall complete the Project in an expeditious manner and shall commence work within ten (10) days after being notified by the City with a Notice to Proceed on any given property or properties. All work shall be completed and necessary reports and documentation provided within **the Contract Term** (anticipated to be November 20). If Contractor is prevented from timely completing the work because of circumstances beyond the Contractor's reasonable control as determined by the City, the time for completion of the work will be tolled for a period of time equivalent to the stoppage resulting from such circumstances. The Contractor does hereby expressly acknowledge and agree that **time is of the essence** of this Contract, and, thus, failure by the Contractor to timely render and perform services hereunder shall constitute a material breach of the Contract.

4.5 A mandatory walkthrough will not be required, but bidders are advised/encouraged to make their own inspections prior to bid submittal. The Planning Department is **not** in possession of a key to any of the properties. Properties may be boarded up and may require a cordless drill with various bits to remove boards to provide access. Please re-install any boards you remove to attempt to maintain security. Please Note: some of these properties are in very poor condition, and may require careful methods (such as an extension ladder) to reach basements or upper levels. Use caution when entering the properties. Enter at your own risk.

SECTION V
GENERAL TERMS AND CONDITIONS

1. **LANGUAGE, WORDS USED INTERCHANGEABLY** - The word CITY refers to the CITY OF WATERLOO, IOWA throughout these Instructions and Terms and Conditions. Similarly, PROPOSER refers to the person or company submitting an offer to sell its goods or services to the CITY, and CONTRACTOR refers to the successful bidder.

2. **PROPOSER QUALIFICATIONS** - No Proposal shall be accepted from, and no Contract will be awarded to, any person, firm or corporation that is in arrears to the City upon debt or Contract, that is a defaulter, as surety or otherwise, upon any obligation to the City, or that is deemed irresponsible or unreliable by the City. If requested, Proposers shall be required to submit satisfactory evidence that they have a practical knowledge of the particular supply/service proposal and that they have the necessary financial resources to provide the proposed supply/service as described in this Request for Proposal.

3. **SPECIFICATION DEVIATIONS BY THE PROPOSER/ OFFEROR** - Any deviation from this specification MUST be noted in detail, and submitted in writing in the Proposal. Completed specifications should be attached for any substitutions offered, or when amplifications are desirable or necessary. The absence of the specification deviation statement and accompanying specifications will hold the Proposer strictly accountable to the specifications as written herein. Failure to submit this document of specification deviation, if applicable, shall be grounds for rejection of the item when offered for delivery. If specifications or descriptive papers are submitted with Proposals, the Proposer's name should be clearly shown on each document.

4. **COLLUSIVE PROPOSAL** - The Proposer certifies that the proposal submitted by said Proposer is done so without any previous understanding, agreement or connection with any person, firm, or corporation making a proposal for the same Contract, without prior knowledge of competitive prices, and it is, in all respects, fair, without outside control, collusion, fraud or otherwise illegal action.

5. **SPECIFICATION CHANGES, ADDITIONS AND DELETIONS** - All changes in Proposal documents shall be through written addendum. Verbal information obtained otherwise will **NOT** be considered in awarding of Proposals.

6. **PROPOSAL CHANGES** - Proposals, amendments thereto, or withdrawal requests received after the time advertised for Proposal opening, will be void regardless of when they were mailed.

7. **HOLD HARMLESS AGREEMENT** - The Contractor agrees to protect, defend, indemnify and hold harmless the City of Waterloo, its officers and employees, their agencies and agents, from any and all claims and damages of every kind and nature made, rendered or incurred by or in behalf of every person or corporation whatsoever, including the parties hereto and their employees that may arise, occur, or grow out of any acts, actions, work or other activity done by the Contractor, its employees, subcontractors or any independent contractors working under the direction of

either the Contractor or subcontractor in the performance of this Contract.

8. **PROPOSAL REJECTION OR PARTIAL ACCEPTANCE** - The City reserves the right to reject any or all Proposals. The City further reserves the right to waive technicalities and formalities in Proposals, as well as to accept in whole or in part such Proposals where it is deemed advisable in protection of the best interests of the City.

9. **PROPOSAL CURRENCY/LANGUAGE** - All proposal prices shall be shown in US Dollars ($). All prices must remain firm for the duration of the Contract regardless of the exchange rate. All proposal responses must be submitted in English.

10. **PAYMENTS** - Payments will be made for all goods/services delivered, inspected and accepted within 45 days and on receipt of an original invoice and all necessary supporting documentation.

11. **MODIFICATION, ADDENDA & INTERPRETATIONS** - Any apparent inconsistencies, or any matter requiring explanation or interpretation, must be inquired into by the Proposer in writing at least 72 hours (excluding weekends and holidays) prior to the time set for the Proposal opening. Any and all such interpretations or modifications will be in the form of written addenda. All addenda shall become part of the Contract documents and shall be acknowledged and dated on the signature page.

12. **LAWS AND REGULATIONS** - All applicable State of Iowa and federal laws, ordinances, licenses and regulations of a governmental body having jurisdiction shall apply to the award throughout as the case may be, and are incorporated here by reference.

13. **SUBCONTRACTING** - No portion of this Proposal may be subcontracted without the prior written approval by the City.

14. **ELECTRONIC SUBMITTAL** - Telegraphic and/or proposal offers sent by electronic devices (e.g. facsimile machines) are not acceptable and will be rejected upon receipt. Proposing firms will be expected to allow adequate time for delivery of their proposal either by airfreight, postal service, or other means.

15. **CANCELLATION** - Either party may cancel the award in the event that a petition, either voluntary or involuntary, is filed to declare the other party bankrupt or insolvent or in the event that such party makes an assignment for the benefit of creditors.

16. **ASSIGNMENT** - Proposer shall not assign this order or any monies to become due hereunder without the prior written consent of the City. Any assignment or attempt at assignment made without such consent of the City shall be void.

17. **EQUAL OPPORTUNITY** - The successful firm agrees not to refuse to hire, discharge, promote, demote, or to otherwise discriminate in matters of compensation against any person otherwise qualified solely because of age, race, color, religion, sex, sexual orientation, gender identity, marital status, national origin, citizenship status, disability, or veteran status.

18. **TAXES** - The City of Waterloo is exempt from sales tax and certain other use taxes. Any charges for taxes from which the City is exempt will be deducted from invoices before payment is made.

19. **PROPOSAL INFORMATION IS PUBLIC** – All documents submitted with any proposal and the proposal shall become public documents and subject to Iowa Code Chapter 22, which is otherwise known as the “Iowa Open Records Law”. By submitting any document to the City of Waterloo in connection with a proposal, the submitting party recognized this and waives any claim against the City of Waterloo and any of its officers and employees relating to the release of any document or information submitted.

    Each submitting party shall hold the City of Waterloo and its officers and employees harmless from any claims arising from the release of any document or information made available to the City of Waterloo arising from any proposal opportunity.

EXHIBIT "A"

SIGNATURE PAGE

The undersigned Proposer/Bidder, having examined these documents and having full knowledge of the condition under which the work described herein must be performed, hereby proposes that they will fulfill the obligations contained herein in accordance with all instructions, terms, conditions, and specifications set forth; and that they will furnish all required services and pay all incidental costs in strict conformity with these documents for the stated process as payment in full.

321 Dearborn Av, 521 Pine St, 314 Reber Av, 1410 Mulberry St, 420 Bayard St, and 623 N Barclay St.

Total "lump sum" bid: $_____

Total bid in written form: _____

Submitting Firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Authorized Representative (print) _____

Authorized Representative Signature _____

Date: _____ Email: _____

Phone: _____ Fax: _____

EXCEPTIONS/DEVIATIONS to this Request for Proposal shall be listed in writing on an attached document provided by the Bidder. Please be as specific as possible. Please check one:

____ Our company has **no** exceptions/deviations.
____ Our company **does** have exceptions/deviations which are listed on an attached document.

GENERAL INFORMATION. Freight and/or delivery charges, if any, shall be included in the price.

FIRM PRICING. Offered prices shall remain firm for a minimum of ninety (60) days after the due date of this solicitation unless indicated otherwise. Accepted prices shall remain firm for the duration of the contract.

ADDENDA (It is the Bidder's responsibility to check for issuance of any addenda). The authorized representative herby acknowledges receipt of the following addenda:

Addenda Number _____ Date _____ Addenda Number _____ Date _____

☐ We choose not to bid at this time but would like to be considered for future requests for bid

Our "not to exceed" bid price for each property is:

Property Address	**Per Property Cost (bid) Total**
321 Dearborn Avenue	$
521 Pine Street	$
313 Reber Avenue	$
1410 Mulberry Street	$
420 Bayard Street	$
623 N Barclay Street	$
Total Proposed Lump Sum Contract Amount:	**$**

EXHIBIT "C" DRAFT

ASBESTOS ABATEMENT SERVICES CONTRACT #AB-2026-08-06P

321 Dearborn Avenue, 521 Pine Street, 314 Reber Avenue, 1410 Mulberry Street, 420 Bayard Street, and 623 N Barclay Street.

This Contract for Asbestos Abatement Services (the "Contract") is entered into as of September 8, 2026, by and between the City of Waterloo, Iowa ("City") and _____. In consideration of the mutual promises exchanged herein, the parties agree as follows:

1. Term and Services. For the period of September 21, 2026 thru November 20, 2026, subject to extension upon the mutual written agreement of the parties, the Contractor agrees to furnish all tools, labor and materials, and perform and substantially complete all work within the time period stated in the specifications after receipt of Notice to Proceed with respect to a given property or set of properties. By executing this Contract, Contractor certifies that it holds an asbestos permit issued by the Iowa Division of Labor and that all personnel who perform work on the project will have an asbestos license issued by the Iowa Division of Labor. Contractor agrees that such permit and licenses will be maintained during the term of this Contract. Work to be performed includes all work described in the Contract Documents (defined below).

Contractor shall provide the above services at the cost set forth in the Contractor's RFB response. Contractor's request for payment for services authorized under this Contract shall be submitted in accordance with the Contract Documents and will be paid within forty-five (45) days after receipt of an original invoice and after such services are delivered and accepted and all necessary supporting documentation is submitted. Contractor will be paid for all items satisfactorily completed. Such payment will be full compensation for asbestos removal and disposal, for all permits, licenses, inspections, for complying with all laws, rules, regulations and ordinances, including safety, and for furnishing all materials, equipment and labor to complete the work in accordance with the plans and specifications.

2. Contract Documents. The following documents (collectively, the "Contract Documents") are hereby incorporated by reference as though set forth herein in full:

a. Request for Bid
b. Addenda (if any)
c. Response (Proposal) from the Contractor

In the event of conflict between the provisions of the Contract Documents and this Contract, the provisions of this Contract shall prevail.

2.1 Contract Limits. Total actual expenses allowed by the project Contract, including any renewal extensions of the Contract, shall not exceed **$**_____as provided in the Bid Tabulation that is part of Contractor's RFB Response referenced in Section 2.c above, except by written amendment as provided herein.

3. Approval; Timing of Work. Contractor shall not begin work until after the Contract has been approved by the City Council and the Contractor has been issued a Notice to Proceed. The work shall commence within ten (10) days after the City has issued a Notice to Proceed with respect to any particular property or set of properties, and all work shall be completed and delivered within the term of the Contract, including any renewal extensions.

4. Performance Bond. Contractor will be required to furnish bond in an amount equal to one hundred percent (100%) of the Contract price and shall be issued by a responsible surety acceptable to the City. The bond shall guarantee the faithful performance of the Contract and the terms and conditions therein contained, shall guarantee the prompt payment of all materials and labor and protect and save harmless the City from claims and damages of any kind arising out of the performance of this Contract..

5. Reporting; Records. Contractor shall exercise best efforts to maintain communication with City personnel whose involvement in the project is necessary or advisable for successful and timely completion of the work of the project. Communications between the parties shall be verbal or in writing, as requested by the parties or as dictated by the subject matter to be addressed. Contractor shall maintain all project records for a minimum period of three (3) years after the date of final payment for services rendered under this Contract. During the term of this Contract and for the ensuing record-retention period, Contractor shall make any or all project records available upon reasonable request, and in any event within two (2) business days of request, to City, and any other agency of state or federal government. For purposes of this section, "records" means any and all books, documents, papers and records of any type or nature that are directly pertinent to this Contract. Contractor agrees to furnish, upon termination of this Contract and upon demand by the City, copies of all basic notes and sketches, charts, computations, and any other data prepared or obtained by the Contractor pursuant to this Contract, without cost and without restrictions or limitation as to the use relative to specific projects covered under this Contract. In such event, the Contractor shall not be liable for the City's use of such documents on other projects.

6. Reserved.

7. Indemnity. Except as to any negligence of City, its officials, officers, employees, agents, or elected officials, in the performance of any duty under this Contract, and to the extent not covered by insurance maintained by Contractor, Contractor agrees to defend and indemnify City, its officials, officers, employees, agents and elected officials, and to hold same harmless, from and against any and all claims, demands, causes of action, losses, costs, or liabilities whatsoever, including but not limited to reasonable attorneys' fees and expenses, arising from or in connection with the acts or omissions of Contractor in providing the services contemplated by this Contract. This will include but is not limited to actions or suits based upon or alleging bodily injury, including death, or property damage rising out of or resulting from the Contractor's operation under this Contract, whether by itself or by any subcontractor or anyone directly or indirectly employed by any of them. Contractor is not and shall not be deemed an agent or employee of the City.

8. Default; Termination for Cause. In the event that Contractor defaults in the performance or observance of any covenant, agreement or obligation set forth in this Contract, and if such default remains uncured for a period of seven (7) days after notice thereof shall have been

given by City to Contractor (or for a period of fourteen (14) days after such notice if such default is curable but requires acts to be done or conditions to be remedied which, by their nature, cannot be done or remedied within such 14-day period and thereafter Contractor fails to diligently and continuously prosecute the same to completion within such 14-day period), then City may declare that Contractor is in default hereunder and may take any one or more of the following steps, at its option:

a. by mandamus or other suit, action or proceeding at law or in equity, require Contractor to perform its obligations and covenants hereunder, or enjoin any acts or things which may be unlawful or in violation of the rights of the City hereunder, or obtain damages caused to the City by any such default;

b. have access to and inspect, examine and make copies of all books and records of Contractor which pertain to the project;

c. declare a default of this Contract, make no further disbursements, and demand immediate repayment from Contractor of any funds previously disbursed under this Contract;

d. terminate this Contract by delivery to Contractor of written notice of termination; and/or

e. take whatever other action at law or in equity may be necessary or desirable to enforce the obligations and covenants of Contractor hereunder, including but not limited to the recovery of funds.

No delay in enforcing the provisions hereof as to any breach or violation shall impair, damage or waive the right of City to enforce the same or to obtain relief against or recover for the continuation or repetition of such breach or violation or any similar breach or violation thereof at any later time or times. In the event that City prevails against Contractor in a suit or other enforcement action hereunder, Contractor agrees to pay the reasonable attorneys' fees and expenses incurred by City.

9. Termination for Convenience. This Contract may be terminated at any time, in whole or in part, upon the mutual written agreement of the parties. City may also choose to terminate this Contract at any time by delivering to Contractor 10-days' advance written notice of intent to terminate.

10. Non-Assignable Duties. Contractor may not assign its duties hereunder without the prior written consent of City.

11. Independent Contractor. Contractor is an independent contractor and is not an employee, servant, agent, partner, or joint venturer of City. Contractor has no power or authority to enter into contracts or agreements on behalf of City. City shall determine the work to be done by Contractor, but Contractor shall determine the legal means by which it performs the work specified by City. City is not responsible for withholding, and shall not withhold, FICA or taxes of any kind from any payments which it owes Contractor. Neither Contractor nor its employees, if any, shall be entitled to receive any benefits which employees of City are entitled to receive and shall not be entitled to workers' compensation, unemployment compensation, medical

insurance, life insurance, pension, or any benefits of any type or nature whatsoever on account of their work for City. Contractor shall be solely responsible for compensating its employees, if any.

12. Anti-Discrimination. During the performance of this Contract, Contractor, for itself, its assignees and successors in interest, agrees to comply with the anti-discrimination laws of the State of Iowa, as contained in Sections 19B, 551.4 of the Code of Iowa, which are herein incorporated by reference and made a part of this Contract.

13. Severability. In the event any provision of this Contract, together with the Contract Documents, is held invalid, illegal, or unenforceable, whether in whole or in part, the remaining provisions of this Contract shall not be affected thereby and shall continue in full force and effect. If, for any reason, a court finds that any provision of this Contract is invalid, illegal, or unenforceable as written, but that by limiting such provision it would become valid, legal, and enforceable, then such provision shall be deemed to be written and shall be construed and enforced as so limited.

14. General Terms. This Contract, together with the Contract Documents, constitutes the entire agreement between the parties pertaining to the subject matter hereof. This Contract may not be modified or amended except pursuant to the mutual written agreement of the parties. This Contract is binding on the parties and the heirs, personal representatives, successor and assigns of each. Time is of the essence in the performance of the terms hereof.

IN WITNESS WHEREOF, the parties have executed this Contract for Asbestos Abatement Services as of the date first set forth above.

CITY OF WATERLOO, IOWA

By: _____
David Boesen, Mayor

Attest: _____
Kelly Felchle, City Clerk

CONTRACTOR

_____
Authorized Representative

ASBESTOS INSPECTION REPORT

Inspection Address:

City of Waterloo
Vacant Property
321 Dearborn Ave
Waterloo, IA
Project #: 26-30968

Prepared for:

City of Waterloo
Attn: Aric Schroeder
715 Mulberry St.
Waterloo, IA 50703

Prepared by:

Travis Haas

Travis J. Haas, Inspector

7/14/26
Date

25-13724
Inspector #

8/2/26
License Expiration date

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SECTION 1

INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspected Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (l) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packaging, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials, i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspected asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility of these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms, i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspected ACM.

3. **Debris: In** areas where damaged ACM may be found there may and usually will be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

6. **In the Inspection Report,** certain items such as mudded joints (MJ) or metal doors (MD), etc. are listed as units or number of units, i.e. 10 MJ, 3 Damaged, which is an indication of count rather than square feet or linear feet. Most materials listed in the assessment are either listed as square feet or linear feet with these noted exceptions.

7. **In the Assessment Process,** there are additional codes such as ME and MG; ME representing miscellaneous electrical and MG representing miscellaneous gasket materials. Both codes are used to indicate materials that are unusual to the normal course of an assessment of the building. Miscellaneous electrical materials include old electrical wiring, switchboards, transite panels, etc. Miscellaneous gasket materials can be found between (thermal) valves, on boiler doors, between fittings, between molds, etc. These codes give the Inspector the ability to qualify materials, which sometimes may not be considered as ACM.

8. **An Asbestos Code Sheet** is included with the Inspector's inspection report, which informs the client as to the Homogeneous Codes used during the inspection process.

9. **Caution-** Regarding Inspection results- Floor tiles, adhesives, and drywall (mud) found to not contain asbestos should be re-analyzed under the “Chatfield Method” of TEM analysis. Many times, the results from having these materials analyzed under PLM result in false positives or false negatives. After reviewing your report, please notify the inspector if you want these samples analyzed under the “Chatfield Method”.

10. Any sample less than 10% asbestos may be Point Counted. Point counting is a more accurate method of analyzing bulk samples. The results of the point counting are the results that will determine if the material will be treated as asbestos.

11. Asbestos inspections are performed based on current understanding of the regulations. As new interpretations of the regulations are made aware of by the EPA, DNR, and Iowa Division of Labor. Advanced Environmental Testing and Abatement Inc. will adapt their inspections to comply with these new procedures. If additional sampling is required by the different agencies, Advanced Environmental will do the additional sampling. The owner is responsible for the additional cost for these samples as well as labor.

12. Advanced Environmental shall not be responsible for any cost of abating any additional asbestos discovered in any renovation or demolition activities. Any additional items discovered shall be tested when they become accessible. For example, old adhesives may be under new floor tiles and adhesives. Additional materials may be concealed in walls, under multi layers of flooring, etc.

13. All amounts listed are estimates. It is up to other contractors to field verify any amounts that are listed within this report.

14. All material that looks similar should be treated as asbestos containing materials.

15. Asbestos Material containing <1%. Some material tested for asbestos may contain trace amounts of asbestos and be below the threshold for asbestos contain material according to both the Iowa DNR and Iowa State Code. However, the Federal Occupational Safety and Health Administration still have some regulations that contractors must follow under 29 CFR 1926.1101. Contractors working with asbestos material with <1% asbestos must still produce a negative and initial exposure assessment, completed by a “competent person”. Contractors must follow 29 CFR 1926. 1101 (g)(1)(ii) and (iii) and 29 CFR 1926. 1101(g)(3)(i), (ii), and (iv). Please contact Advanced Environmental Testing and Abatement, Inc. for consultation on how to handle material with <1% asbestos.

16. Flat roofs: If any layer of a flat roof tests positive for asbestos, all layers should be considered asbestos and removed as such. Advanced Environmental makes every effort to core roof samples through all layers. If flashing is identified as

asbestos containing, all tar on walls and adjacent roof decks shall be bid as and treated as asbestos containing unless separately and disproved by the abatement contractor.

17. Prior to the start of any demolition, have the demolition contractor review the asbestos inspection report, do a building walk through and sign that he agrees with the report and sees no questionable items. If any suspect material is discovered during the demolition, the demolition contractor shall stop immediately and inform the building owner of the suspect materials.

18. If asbestos containing materials are found during demolition:
    1: Stop demolition
    2: Call inspector
    3: Notify DNR of change through notification and phone call:
        515-725-9576

Options for handling found asbestos during demolition activities:

1: Have the inspector stay on site and direct what ACM (RACM) should go as RACM or what they want to go as regular construction waste.
2: Least logical: Most Expensive: Treat all waste as RACM. This isn't necessary in most cases. Demolition contractors have the most to gain in this option.

19. The inspector shall not be responsible for the cost of abating any "found" asbestos after the original inspection. The inspector did not create them just aided in identifying them. The owner pays for all abatement and RACM found or made on the site. Payment for the inspection means acceptance of the conditions herein – no exceptions.

ASBESTOS CODES

A = Assumed
ADH = Adhesive
APW = Air Cell Pipe Wrap
BP = Boiler Plaster
C = Ceiling
CAPS = Stair Treads
CQ = Can't Quantify
CT = Ceiling Tiles
CT/12 = 12" Ceiling Tiles
DAM. = Damaged
DEB = Debris
DW = Drywall
F = Friable
FE = Furnace Exhaust
FT = Floor Tiles
GASK = Gaskets
GYM = Gypsum
HOMO = Homogeneous
LINO = Linoleum
MISC = Miscellaneous Non-Friable
MAC = Metal Asbestos Chimney
MATL DESC = Material Description
MD = Metal Door
ME = Miscellaneous Electrical
MF = Miscellaneous Friable
MJ = Mudded Joint
NC = Nose Cap
NF = Non-friable
NSM = Not Suspect Material
P or PH = Previous History
PP = Patched Plaster/Drywall
PSA = Sand Plaster
PSM = Smooth Plaster
S = Sample/Samples/Sampled
SCT = Suspended Ceiling Tile
SR = Sample Result
ST = Storage Tank
SUR = Surfacing
T = Thermal
Thermal Pipe Measurement = Linear Ft
TR = Transite
TSI = Thermal System Insulation
VC = Vibration Cloth
VDW = Vinyl Covered Drywall
W = Walls
WD = Wood Door
N = North
S = South
E = East
W = West

1. All Metal Doors are listed by quantities, example 3 = 3 metal doors.
2. All Mudded Joints are listed by quantities of MJ, not sizes.
3. All Pipe Wrap materials are listed in linear feet.
4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
Y = Considered Asbestos Containing Material
P or PH = Previous History
N/A = Not Analyzed
<1% = Contains less than 1% Asbestos Containing Material
>1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non-Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non-Friable ACM.

SECTION 4

ASBESTOS INSPECTION REPORT SUMMARY

METHOD:

All collected samples were submitted to EMC LABS, INC., located in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP #101926-0) for Polarized Light Microscopy (PLM) analysis. The sampling was conducted by a State of Iowa licensed asbestos inspector and followed the National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos-containing materials (ACMs) were analyzed using EPA Method 600-R93-116 via PLM.

OVERVIEW:

Advanced Environmental Testing and Abatement, Inc. performed an Asbestos Containing Materials (ACM) Inspection on July 1st and July 9th, 2026. The purpose of this inspection was to identify the presence of asbestos-containing materials prior to the future demolition of the residence.

- **Property Description:**
  - Residential house and garage
- **Occupancy Status at Time of Inspection:** Vacant
- **Scope of Inspection:** Total Inspection

RESULTS:

- **Total Bulk Samples Collected:** twenty-nine (29) samples
- **Asbestos Detected:** Five (5) samples with asbestos

All building materials similar in appearance, color, and/or texture to those determined to contain asbestos must be assumed to contain asbestos throughout the building.

SECTION 5

POSITIVE MATERIALS:

The following samples tested positive (>1%) for asbestos or are assumed to contain asbestos:

Material	Color	Location	Results	Quantity
Drywall compound	White	Kitchen	3% Chrysotile	420 Sq. Ft.
Sink Coating	Black	Kitchen	10% Chrysotile	1 Each
Construction Adhesive	Brown	Stairwell to second floor, 2nd floor landing	10% Chrysotile	200 Sq. Ft.
Transite Siding	Grey	Exterior House	15% Chrysotile	1,100 Sq. Ft.

REGULATION REVIEW

The United State Environmental Protection Agency definition of asbestos containing materials (ACM) is a material with an asbestos content greater than 1%. According to Iowa Division of Labor, ACM is any material found to contain asbestos, regardless of its concentration. Materials containing asbestos containing <1% asbestos still have some Division of Labor regulations overseeing removal of the material.

CONCLUSIONS AND RECOMMENDATIONS

The results of laboratory testing during the asbestos inspection contained five (5) positive samples for asbestos from four (4) homogenous materials.

Advanced Environmental Testing and Abatement, Inc. make the following recommendations and conclusions:

1: Removal of all asbestos containing materials prior to demolition of the structure.

2: Drywall compound in the kitchen originally tested positive for asbestos with the living room testing negative for asbestos. Additional sampling was conducted in the living room and kitchen. The living room sampled tested negative for asbestos while one of the two kitchen samples tested positive. It is our recommendation to treat the kitchen drywall compound only as asbestos.

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Facility Name/Site Location					
			City of Waterloo 321 Dearborn Ave Waterloo, IA		**Inspected By:** Travis Haas
Sample No	**Material**	**Color**	**Location**	**Current Condition**	**Results**
7126-1A	Plaster	Grey	2nd floor hallway	Sign. Damaged	0%, 0%
7126-1B	Plaster	Grey	First floor living room ceiling	Sign. Damaged	0%, 0%
7126-1C	Plaster	Grey	First floor bathroom ceiling	Sign. Damaged	0%
7126-2A	Floor tile	Tan	2nd floor hallway flooring	Sign. Damaged	0%
7126-2B	Floor tile	Tan	1st floor rear porch	Sign. Damaged	0%
7126-3A	Ceiling tile/adhesive	White	1st floor front porch	Good	0%, 0%
7126-4A	Ceiling tile	White	First floor bathroom ceiling	Sign. Damaged	0%
7126-5A	Texture	White	Living room ceiling	Sign. Damaged	0%
7126-5B	Texture	White	Living room ceiling	Sign. Damaged	0%
7126-5C	Texture	White	Living room ceiling	Sign. Damaged	0%
7126-6A	Drywall/compound	White	Walls in living room	Sign. Damaged	0%, 0%, 0%, 0%
7126-6B	Drywall/compound	White	Walls in kitchen	Sign. Damaged	0%, 3%, 0%, 3%
7126-7A	Vinyl flooring	Tan	Bathroom top layers of flooring	Sign. Damaged	0%, 0%
7126-7B	Vinyl flooring	Tan	Kitchen top layers of flooring	Sign. Damaged	0%, 0%
7126-8A	Floor tile	Green	Storage closet by bathroom	Good	0%, 0%
8126-9A	Sink coating	Black	Kitchen sink	good	10%
7126-10A	Construction adhesive	Brown	Stairway to second floor	Sign. Damaged	10%
7126-11A	Linoleum	Green	Kitchen bottom layer	Good	0%, 0%
7126-12A	Transite	Grey	Exterior siding	Damaged	15%, 0%
7126-13A	Window glazing	White	Windows	Damaged	0%
7126-14A	Caulking	White	Storm windows 1st floor	Good	0%
7126-15A	Shingle/tar paper	Brown/black	Front porch shingles	Good	0%, 0%
7126-16A	Tar	Black	Flashing tar front porch	Good	0%
7126-16B	Tar	Black	Tar on metal over rear porch	Good	0%
7126-17A	Shingle/tar paper	Grey/black	Main roof shingles	Sign. Damaged	0%, 0%, 0%
			Additional Drywall Samples		
7926-1A	Drywall/compound	White	Living room walls	Good	0%, 0%, 0%,0%
7926-1B	Drywall/compound	White	Living room walls	Good	0%, 0%, 0%, 0%
7926-2A	Drywall compound	White	Kitchen walls	Good	0%

7926-2B	Drywall/compound	White	Kitchen walls	Good	0%, 3%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0353603

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353603-001 7126-1A	2ND FLOOR HALLWAY	LAYER 1 Plaster-Scratch Coat, Gray/ Beige	No	None Detected	Hair	<1%
					Gypsum	
					Quartz	
					Non-Fibrous Binder/Filler	99%
		LAYER 2 Plaster Texture/ Paint, Green/ Yellow/ Blue/ White	No	None Detected		
					Gypsum	
					Carbonates	
					Quartz	
					Non-Fibrous Binder/Filler	100%
0353603-002 7126-1B	FIRST FLOOR LIVING ROOM	LAYER 1 Plaster-Scratch Coat, Gray/ Beige	No	None Detected	Hair	<1%
					Gypsum	
					Quartz	
					Non-Fibrous Binder/Filler	99%
		LAYER 2 Plaster Texture/ Paint, White	No	None Detected	Cellulose Fiber	<1%
					Gypsum	
					Quartz	
					Non-Fibrous Binder/Filler	99%
0353603-003 7126-1C	FIRST FLOOR BATHROOM	Plaster, White	No	None Detected	Cellulose Fiber	<1%
					Gypsum	
					Quartz	
					Non-Fibrous Binder/Filler	99%
0353603-004 7126-2A	2ND FLOOR HALLWAY	Floor Tile, Tan/ White Note: No Mastic Present	No	None Detected		
					Carbonates	
					Quartz	
					Non-Fibrous Binder/Filler	100%

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Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0353603-005 7126-2B	1ST FLOOR REAR PORCH	Floor Tile, Tan/ White Note: No Mastic Present	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
0353603-006 7126-3A	1ST FLOOR FRONT PORCH	LAYER 1 Ceiling Tile, Lt. Brown	No	None Detected	Cellulose Fiber 85% Carbonates Gypsum Non-Fibrous Binder/Filler 15%
		LAYER 2 Adhesive, Yellow	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
0353603-007 7126-4A	FIRST FLOOR BATHROOM	Ceiling Tile, White/ Tan	No	None Detected	Cellulose Fiber 90% Carbonates Gypsum Non-Fibrous Binder/Filler 10%
0353603-008 7126-5A	LIVING ROOM	Texture, White w/Flecks	No	None Detected	Carbonates Mica Non-Fibrous Binder/Filler 100%
0353603-009 7126-5B	LIVING ROOM	Texture, White w/Flecks	No	None Detected	Carbonates Mica Non-Fibrous Binder/Filler 100%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client: ADVANCED ENVIRONMENTAL
Address: 803 RICKER ST
WATERLOO, IA 50703
Collected: 07/01/2026
Project Name: CITY OF WATERLOO DEARBORN
Address:

Job# / P.O. #: 26-30948
Date Received: 07/02/2026
Date Analyzed: 07/06/2026
Date Reported: 07/06/2026
Submitted By: TRAVIS HAAS
Collected By:
EPA Method: App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353603-010 7126-5C	LIVING ROOM	Texture, White w/Flecks	No	None Detected	Carbonates Mica Non-Fibrous Binder/Filler	100%
0353603-011 7126-6A	LIVING ROOM	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber Gypsum Carbonates Non-Fibrous Binder/Filler	12% 88%
		LAYER 2 Joint Compound, White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	100%
		LAYER 3 Tape, Cream	No	None Detected	Cellulose Fiber Carbonates	98% 2%
		LAYER 4 Texture/ Paint, White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	100%

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	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0353603-012 7126-6B	KITCHEN	LAYER 1 Drywall, White/ Brown	No	None Detected		Cellulose Fiber	12%
						Gypsum Carbonates Non-Fibrous Binder/Filler	88%
		LAYER 2 Joint Compound, White	Yes	Chrysotile	3%		
						Carbonates Quartz Non-Fibrous Binder/Filler	97%
		LAYER 3 Tape, Cream	No	None Detected		Cellulose Fiber	98%
						Carbonates	2%
		LAYER 4 Joint Compound, White	Yes	Chrysotile	3%		
						Carbonates Quartz Non-Fibrous Binder/Filler	97%
0353603-013 7126-7A	BATHROOM	LAYER 1 Vinyl Flooring, White	No	None Detected		Cellulose Fiber	17%
						Fibrous Glass	3%
						Carbonates Quartz Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Yellow	No	None Detected		Cellulose Fiber	<1%
						Carbonates Quartz Non-Fibrous Binder/Filler	99%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0353603-014 7126-7B	KITCHEN	LAYER 1 Vinyl Flooring, Tan/ Off White	No	None Detected		Cellulose Fiber Fibrous Glass Carbonates Quartz Non-Fibrous Binder/Filler	17% 3% 80%
		LAYER 2 Mastic, Yellow	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	 100%
0353603-015 7126-8A	STORAGE CLOSET BY BATHROOM	LAYER 1 Floor Tile, Green/ White	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 2 Glue, Clear Note: Difficult to separate adjacent layer	No	None Detected		Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	1% 99%
0353603-016 7126-9A	KITCHEN	Sink Coating, Black	Yes	Chrysotile	10%	Carbonates Quartz Non-Fibrous Binder/Filler	 90%
0353603-017 7126-10A	STAIRWAY TO SECOND FLOOR	Adhesive, Brown	Yes	Chrysotile	10%	Carbonates Quartz Non-Fibrous Binder/Filler	 90%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0353603-018 7126-11A	KITCHEN	LAYER 1 Linoleum, Green/ White	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 2 Mastic, Yellow/ Brown	No	None Detected		Cellulose Fiber Synthetic Fiber Carbonates Quartz Non-Fibrous Binder/Filler	3% <1% 96%
0353603-019 7126-12A	EXTERIOR	LAYER 1 Transite, Gray	Yes	Chrysotile	15%	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler	 85%
		LAYER 2 Felt Paper, Black	No	None Detected		Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	60% 40%
0353603-020 7126-13A		Window Glazing, White	No	None Detected		Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	1% 99%
0353603-021 7126-14A	1ST FLOOR	Caulking, White	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	 100%

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Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353603-022 7126-15A	FRONT PORCH	LAYER 1 Shingle, Tan/ Brown/ Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	20% 80%
		LAYER 2 Tar Paper, Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	45% 55%
0353603-023 7126-16A	FRONT PORCH	Tar, Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	5% 95%
0353603-024 7126-16B	REAR PORCH	Tar, Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	3% 97%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO DEARBORN	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353603-025 7126-17A	MAIN ROOF	LAYER 1 Shingle, White/ Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	20% 80%
		LAYER 2 Shingle, Green/ Black	No	None Detected	Cellulose Fiber Synthetic Fiber Carbonates Quartz Non-Fibrous Binder/Filler	17% 3% 80%
		LAYER 3 Tar Paper, Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	40% 60%

Analyst - Matt Kettler

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

EMC LABS, INC.

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Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0354021

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client: ADVANCED ENVIRONMENTAL
Address: 803 RICKER ST
WATERLOO, IA 50703
Collected: 07/09/2026
Project Name: CITY OF WATERLOO
Address:

Job# / P.O. #: 26-30948
Date Received: 07/10/2026
Date Analyzed: 07/13/2026
Date Reported: 07/13/2026
Submitted By: TRAVIS HAAS
Collected By:
EPA Method: App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0354021-001 7926-1A	LIVING ROOM	LAYER 1 Drywall, White/ Lt. Brown	No	None Detected	Cellulose Fiber Gypsum Quartz Non-Fibrous Binder/Filler	10% 90%
		LAYER 2 Joint Compound, White	No	None Detected	Carbonates Mica Non-Fibrous Binder/Filler	 100%
		LAYER 3 Drywall Tape, Off White	No	None Detected	Cellulose Fiber Carbonates	98% 2%
		LAYER 4 Texture, White/ Off White	No	None Detected	Carbonates Mica Non-Fibrous Binder/Filler	 100%
0354021-002 7926-1B	LIVING ROOM	LAYER 1 Drywall, White/ Lt. Brown	No	None Detected	Cellulose Fiber Gypsum Quartz Non-Fibrous Binder/Filler	10% 90%
		LAYER 2 Joint Compound, White	No	None Detected	Carbonates Mica Non-Fibrous Binder/Filler	 100%
		LAYER 3 Drywall Tape, Off White	No	None Detected	Cellulose Fiber Carbonates	98% 2%
		LAYER 4 Texture/ Paint, White/ Off White Note: Layer is mainly Paint - little Texture present	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	<1% 99%

EMC LABS, INC.

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Laboratory Report
0354021

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/10/2026
	WATERLOO, IA 50703	Date Analyzed:	07/13/2026
Collected:	07/09/2026	Date Reported:	07/13/2026
Project Name:	CITY OF WATERLOO	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0354021-003 7926-2A	KITCHEN	Joint Compound/ Paint, Off White/Lt. Beige Note: Layer is mainly Paint - little Compound present	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
0354021-004 7926-2B	KITCHEN	LAYER 1 Drywall, White/ Lt. Brown	No	None Detected	Cellulose Fiber 10% Gypsum Quartz Non-Fibrous Binder/Filler 90%
		LAYER 2 Joint Compound, White/ Off White	Yes	Chrysotile 3%	Carbonates Mica Non-Fibrous Binder/Filler 97%

Analyst - Ramon Suarez

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION

TRAVIS HAAS

DOB: 01-09-1982

Issued: 08-07-2025



This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
SUPERVISOR	25-13616	06-27-2026
INSPECTOR	25-13724	08-01-2026

IOWA

Asbestos

Larry Johnson, Jr.
Labor Commissione

Certificate No: 5LW08012508AIR
Issue Date: August 4, 2025
Expiration Date: August 1, 2026



This diploma is awarded to

Travis J. Haas

For successfully completing and passing the examination for the

ASBESTOS INSPECTOR

REFRESHER TRAINING COURSE

This training course complies with the requirements of TSCA Title II and is accredited by the State of Wisconsin, Department of Health Services, under chapter DHS 159, Wis. Admin. Code, conducted by

Lake States Environmental, Ltd.

Attended Remotely on August 1, 2025

Examination Date: August 1, 2025

Lake States Environmental, Ltd.
P. O. Box 645, Rice Lake, WI 54868
www.lakestates.com
(800) 254-9811

Grant J Grassle

Grant Grassle - Training Instructor

APPENDIX C
PICTURES

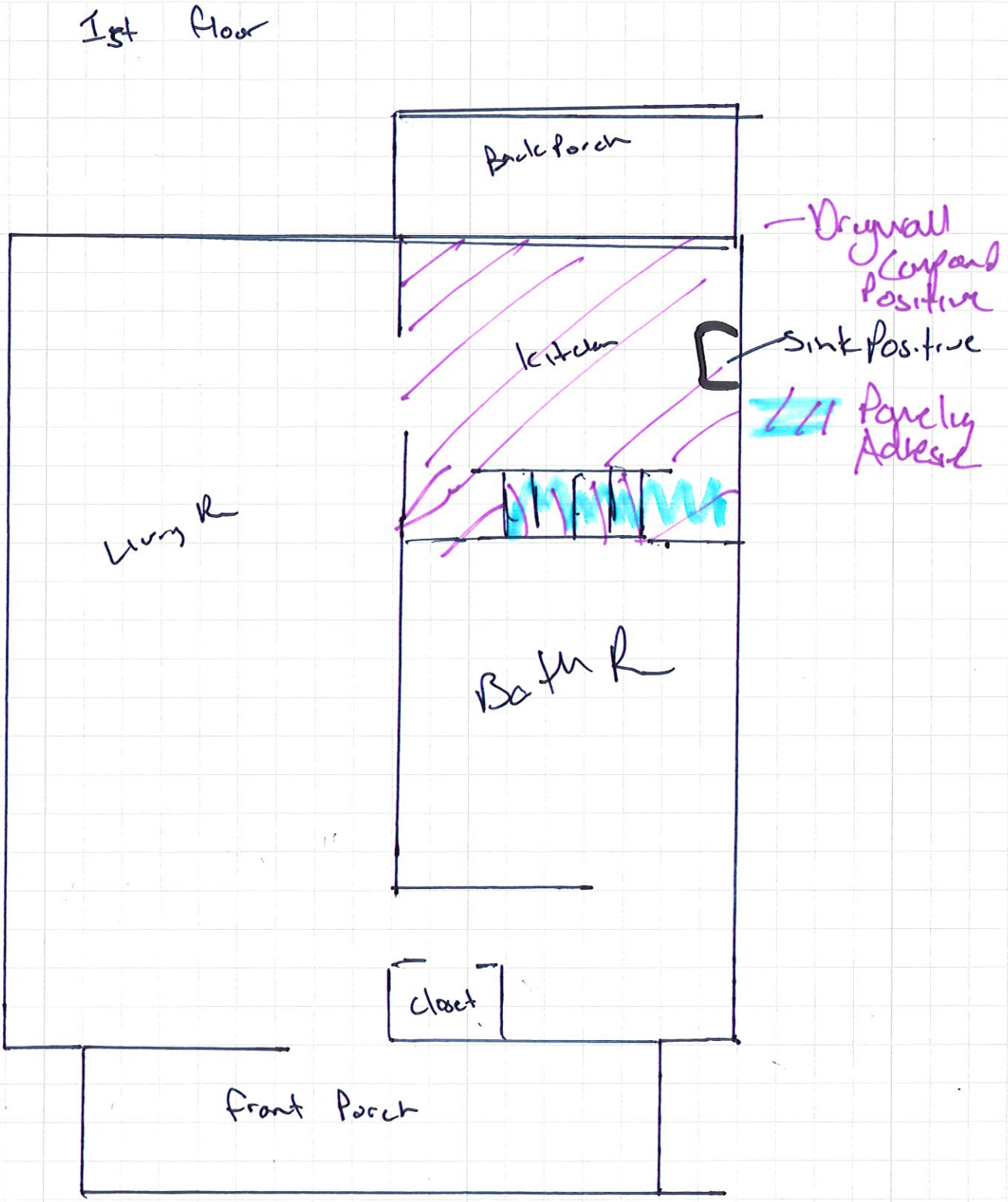
ADVANCED ENVIRONMENTAL TESTING AND ABATEMENT, INC.

WATERLOO, IOWA
319.287.4447

DAVENPORT, IOWA
563.323.2849

KANSAS CITY METRO AREA
816.892.2200

NOTES



ADVANCED ENVIRONMENTAL TESTING AND ABATEMENT, INC.

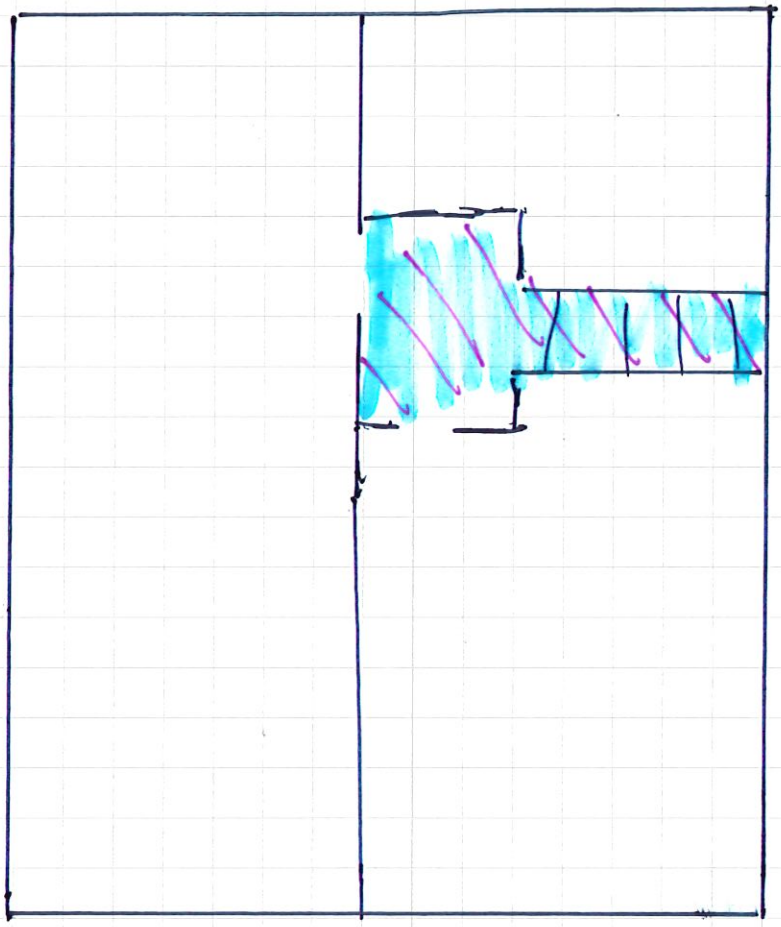
WATERLOO, IOWA
319.287.4447

DAVENPORT, IOWA
563.323.2849

KANSAS CITY METRO AREA
816.892.2200

NOTES

Second floor

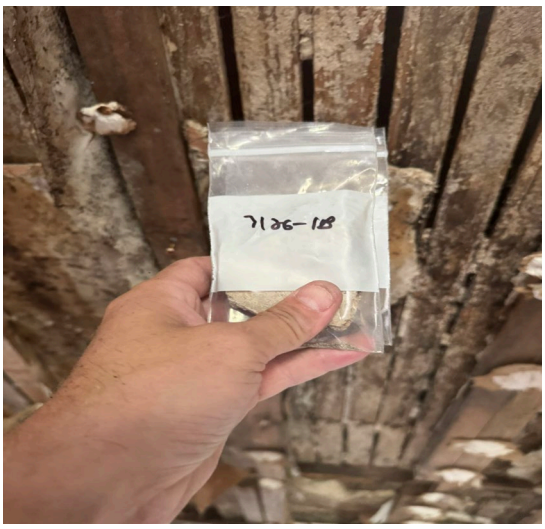


Roofing Adhesive

JOB#:	26-30948	NAME:	City of Waterloo: Dearborn



Sample 7126-1A: Plaster ceiling 2nd floor negative for asbestos.



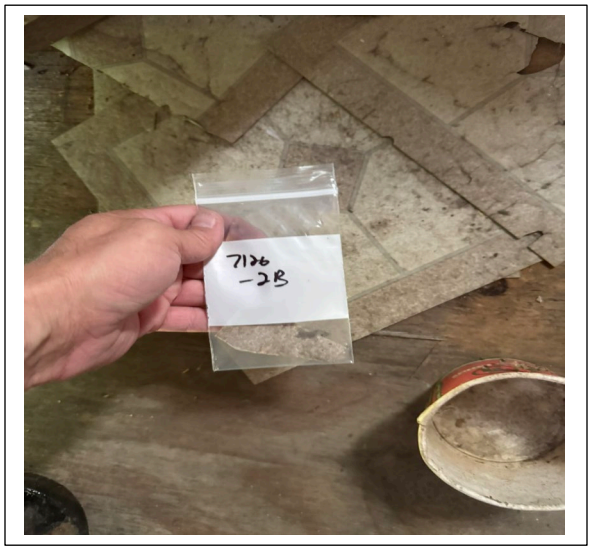
Sample 7126-1B: Plaster ceiling in living room negative for asbestos.



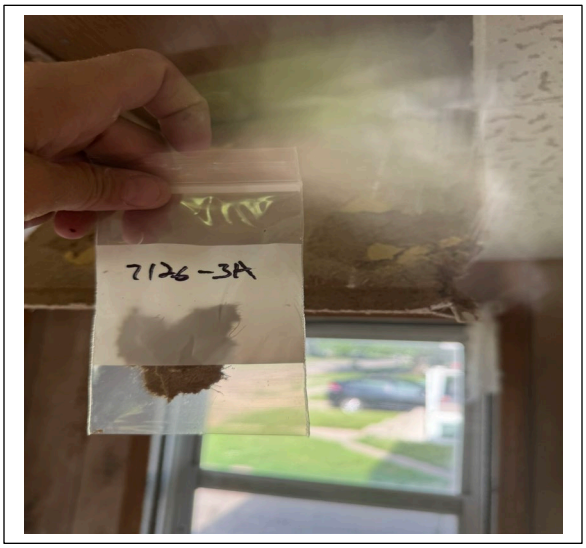
Sample 7126-1C: Plaster ceiling in bathroom first floor negative for asbestos.



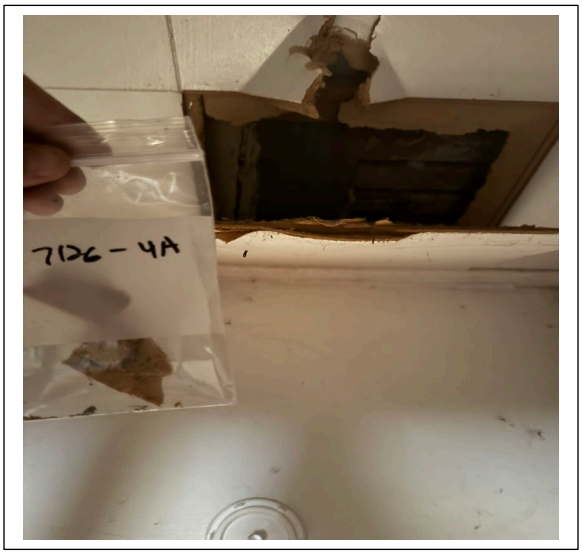
Sample 7126-2A: Floor tile in 2nd floor hallway negative for asbestos.



Sample 71126-2B: Floor tile 1st floor rear porch negative for asbestos.



Sample 71126-3A: Ceiling tile/adhesive 1st floor front porch negative for asbestos.



Sample 71126-4A: Ceiling tile in bathroom 1st floor negative for asbestos.



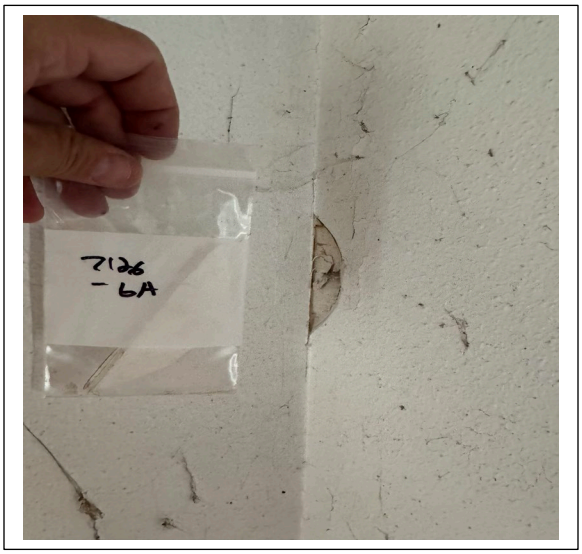
Sample 71126-5A: Texture ceiling in living room negative for asbestos.



Sample 71126-5B: Texture ceiling in living room negative for asbestos.



Sample 71126-5C: Texture ceiling in living room negative for asbestos.



Sample 7126-6A: Drywall/compound living room walls negative for asbestos.



Sample 7126-6B: Drywall/compound walls in kitchen positive for asbestos.



Sample 7126-7A: Vinyl flooring bathroom top layer of flooring negative for asbestos.



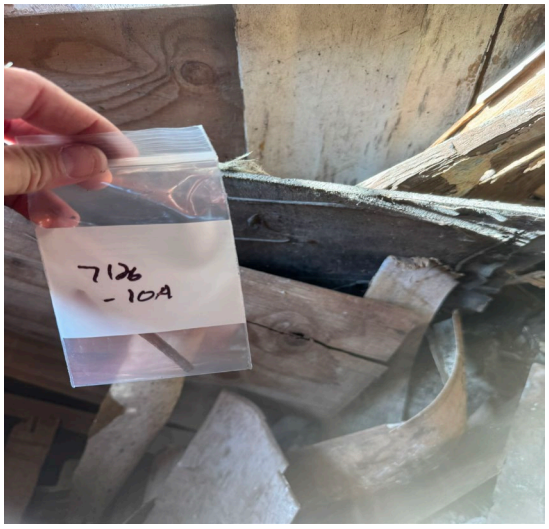
Sample 7126-7B: Vinyl flooring kitchen top layers of flooring positive for asbestos.



Sample 7126-8A: Floor tile in storage closet by bathroom negative for asbestos.



Sample 7126-9A: Sink coating in kitchen positive for asbestos.



Sample 7126-10A: Paneling adhesive in stairwell to second floor and top floor landing positive for asbestos.



Sample 7126-11A: Linoleum bottom layer in kitchen negative for asbestos.



Sample 7126-12A: Transite exterior siding positive for asbestos.



Sample 7126-13A: Window glazing exterior windows negative for asbestos.



Sample 7126-14A: Caulking exterior storm windows negative for asbestos.



Sample 7126-15A: Shingle/tar paper front porch shingles negative for asbestos.



Sample 7126-16A: Tar on front porch flashing negative for asbestos.



Sample7126-16B: Tar on rear porch metal negative for asbestos.



Sample 7126-17A: Shingles/tar paper on main roof negative for asbestos.

Sample 7926-1A: Drywall/compound additional living room samples negative for asbestos. (Missing Pictures)

Sample 7926-1B: Drywall/compound additional living room samples negative for asbestos. (Missing Pictures)



Sample 7926-2A: Drywall/compound additional samples in kitchen negative for asbestos.



Sample 7926-2B: Drywall/compound kitchen walls positive for asbestos.



Exterior front of house.

ASBESTOS INSPECTION REPORT

Inspection Address:

City of Waterloo
521 Pine St
Waterloo, IA 50703

Project #: 26-30948



Prepared for:

Aric Schroeder
Community Planning and Development
715 Mulberry St.

Prepared by:

Thomas Brent Schreibel

Thomas Brent Schreibel

7/20/2026

Date

26-15006

Inspector #

4/21/2027

License Expiration date

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SECTION 1

INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspected Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (I) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packaging, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials, i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspected asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility of these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms, i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspected ACM.

3. **Debris: In** areas where damaged ACM may be found there may and usually will be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

6. **In the Inspection Report,** certain items such as mudded joints (MJ) or metal doors (MD), etc. are listed as units or number of units, i.e. 10 MJ, 3 Damaged, which is an indication of count rather than square feet or linear feet. Most materials listed in the assessment are either listed as square feet or linear feet with these noted exceptions.

7. **In the Assessment Process,** there are additional codes such as ME and MG; ME representing miscellaneous electrical and MG representing miscellaneous gasket materials. Both codes are used to indicate materials that are unusual to the normal course of an assessment of the building. Miscellaneous electrical materials include old electrical wiring, switchboards, transite panels, etc. Miscellaneous gasket materials can be found between (thermal) valves, on boiler doors, between fittings, between molds, etc. These codes give the Inspector the ability to qualify materials, which sometimes may not be considered as ACM.

8. **An Asbestos Code Sheet** is included with the Inspector's inspection report, which informs the client as to the Homogeneous Codes used during the

inspection process.

9. **Caution-** Regarding Inspection results- Floor tiles, adhesives, and drywall (mud) found to not contain asbestos should be re-analyzed under the “Chatfield Method” of TEM analysis. Many times, the results from having these materials analyzed under PLM result in false positives or false negatives. After reviewing your report, please notify the inspector if you want these samples analyzed under the “Chatfield Method”.

10. Any sample less than 10% asbestos may be Point Counted. Point counting is a more accurate method of analyzing bulk samples. The results of the point counting are the results that will determine if the material will be treated as asbestos.

11. Asbestos inspections are performed based on current understanding of the regulations. As new interpretations of the regulations are made aware of by the EPA, DNR, and Iowa Division of Labor. Advanced Environmental Testing and Abatement Inc. will adapt their inspections to comply with these new procedures. If additional sampling is required by the different agencies, Advanced Environmental will do the additional sampling. The owner is responsible for the additional cost for these samples as well as labor.

12. Advanced Environmental shall not be responsible for any cost of abating any additional asbestos discovered in any renovation or demolition activities. Any additional items discovered shall be tested when they become accessible. For example, old adhesives may be under new floor tiles and adhesives. Additional materials may be concealed in walls, under multi layers of flooring, etc.

13. All amounts listed are estimates. It is up to other contractors to field verify any amounts that are listed within this report.

14. All material that looks similar should be treated as asbestos containing materials.

15. Asbestos Material containing <1%. Some material tested for asbestos may contain trace amounts of asbestos and be below the threshold for asbestos contain material according to both the Iowa DNR and Iowa State Code. However, the Federal Occupational Safety and Health Administration still have some regulations that contractors must follow under 29 CFR 1926.1101. Contractors working with asbestos material with <1% asbestos must still produce a negative and initial exposure assessment, completed by a “competent person”. Contractors must follow 29 CFR 1926. 1101 (g)(1)(ii) and (iii) and 29 CFR 1926. 1101(g)(3)(i), (ii), and (iv). Please contact Advanced Environmental Testing and Abatement, Inc. for consultation on how to handle material with <1% asbestos.

16. Flat roofs: If any layer of a flat roof tests positive for asbestos, all layers should be considered asbestos and removed as such. Advanced Environmental makes

every effort to core roof samples through all layers. If flashing is identified as asbestos containing, all tar on walls and adjacent roof decks shall be bid as and treated as asbestos containing unless separately and disproved by the abatement contractor.

17. Prior to the start of any demolition, have the demolition contractor review the asbestos inspection report, do a building walk through and sign that he agrees with the report and sees no questionable items. If any suspect material is discovered during the demolition, the demolition contractor shall stop immediately and inform the building owner of the suspect materials.

18. If asbestos containing materials are found during demolition:
    1: Stop demolition
    2: Call inspector
    3: Notify DNR of change through notification and phone call:
    515-725-9576

Options for handling found asbestos during demolition activities:

1: Have the inspector stay on site and direct what ACM (RACM) should go as RACM or what they want to go as regular construction waste.
2: Least logical: Most Expensive: Treat all waste as RACM. This isn't necessary in most cases. Demolition contractors have the most to gain in this option.

19. The inspector shall not be responsible for the cost of abating any "found" asbestos after the original inspection. The inspector did not create them just aided in identifying them. The owner pays for all abatement and RACM found or made on the site. Payment for the inspection means acceptance of the conditions herein – no exceptions.

ASBESTOS CODES

A = Assumed
ADH = Adhesive
APW = Air Cell Pipe Wrap
BP = Boiler Plaster
C = Ceiling
CAPS = Stair Treads
CQ = Can't Quantify
CT = Ceiling Tiles
CT/12 = 12" Ceiling Tiles
DAM. = Damaged
DEB = Debris
DW = Drywall
F = Friable
FE = Furnace Exhaust
FT = Floor Tiles
GASK = Gaskets
GYM = Gypsum
HOMO = Homogeneous
LINO = Linoleum
MISC = Miscellaneous Non-Friable
MAC = Metal Asbestos Chimney
MATL DESC = Material Description
MD = Metal Door
ME = Miscellaneous Electrical
MF = Miscellaneous Friable
MJ = Mudded Joint
NC = Nose Cap
NF = Non-friable
NSM = Not Suspect Material
P or PH = Previous History
PP = Patched Plaster/Drywall
PSA = Sand Plaster
PSM = Smooth Plaster
S = Sample/Samples/Sampled
SCT = Suspended Ceiling Tile
SR = Sample Result
ST = Storage Tank
SUR = Surfacing
T = Thermal
Thermal Pipe Measurement = Linear Ft
TR = Transite
TSI = Thermal System Insulation
VC = Vibration Cloth
VDW = Vinyl Covered Drywall
W = Walls
WD = Wood Door
N = North
S = South
E = East
W = West

1. All Metal Doors are listed by quantities, example 3 = 3 metal doors.
2. All Mudded Joints are listed by quantities of MJ, not sizes.
3. All Pipe Wrap materials are listed in linear feet.
4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
   Y = Considered Asbestos Containing Material
   P or PH = Previous History
   N/A = Not Analyzed
   <1% = Contains less than 1% Asbestos Containing Material
   >1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non-Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non-Friable ACM.

SECTION 4

ASBESTOS INSPECTION REPORT SUMMARY

METHOD:

All collected samples were submitted to EMC LABS, INC., located in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP #101926-0) for Polarized Light Microscopy (PLM) analysis. The sampling was conducted by a State of Iowa licensed asbestos inspector and followed the National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos-containing materials (ACMs) were analyzed using EPA Method 600-R93-116 via PLM.

OVERVIEW:

Advanced Environmental Testing and Abatement, Inc. performed an Asbestos Containing Materials (ACM) Inspection on June 26th 2026. The purpose of this inspection was to identify the presence of asbestos-containing materials prior to the future demolition of the building.

- **Property Description:**
  - 521 Pine St Waterloo IA 50703
- **Occupancy Status at Time of Inspection:** Vacant
- **Scope of Inspection:** Asbestos Inspection for Demolition

RESULTS:

- **Total Bulk Samples Collected:** Twenty Four (24)
- **Asbestos Detected:** Nine (9)

All building materials similar in appearance, color, and/or texture to those determined to contain asbestos must be assumed to contain asbestos throughout the building.

SECTION 5

POSITIVE MATERIALS:

The following samples tested positive (>1%) for asbestos or are assumed to contain asbestos:

Material	Color	Location	Results	Quantity:
Sheet Vinyl	Redish	Back Bathroom	Layer 1 Sheet Vinyl, Reddish Chrysotile 17% Layer 2 Mastic Brown Chrysotile 5%	10 Sq Ft
Sink Coating	Black	Back North Room	Chrysotile 8%	1 Sink
Window Glazing	White	N Side Addition (Interior window)	Chrysotile 3%	14 Windows(16 sqft)
Vinyl Sheet Flooring	Brown	2nd Floor Kitchen	Layer 1 Sheet Vinyl, Brown Chrysotile 17% Layer 2 Mastic Yellow Chrysotile 5%	150 Sq Ft.
Sink Coating	Black	2nd Floor Kitchen	Chrysotile 5%	1 Sink
Vinyl Sheet Flooring	Yellow	2nd Floor SE Bathroom	Layer 1 Sheet Vinyl,Yellow Chrysotile 17% Layer 2 Mastic Lt. grey Chrysotile 3%	20 Sq Ft.
Pipe Insulation (Aircell)	Whiteish	Basement	Layer 1: Chrysotile 85% Layer 2: None Detected Layer 3: None Detected Layer 4: None Detected	150 Ln Ft.
Pipe Insulation Coating	Yellow	Basement	Chrysotile 5%	150 Ln Ft (Same material as above)
Chimney Flashing	Grey	Roof	Layer 1: Chimney Flashing, Grey Chrysotile 5% Layer 2: Felt Black: None Detected	15 Sq Ft.

REGULATION REVIEW

The United State Environmental Protection Agency definition of asbestos containing materials (ACM) is a material with an asbestos content greater than 1%. According to Iowa Division of Labor, ACM is any material found to contain asbestos, regardless of its concentration. Materials containing asbestos containing <1% asbestos still have some Division of Labor regulations overseeing removal of the material.

CONCLUSIONS AND RECOMMENDATIONS

The results of laboratory testing during the asbestos renovations contained Eight (8) positive samples out of Two (2) taken for asbestos in one homogenous material.

Advanced Environmental Testing and Abatement, Inc. make the following recommendations and conclusions:

1: Removal of all asbestos containing materials prior to demolition by a Permitted asbestos company with the Iowa Department of Inspections, Appeals, and Licensing.

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Sample No	Material	Color	Location	Current Condition	Results
7926-521-1A	Plaster with Wallpaper	brown	Living room Ceiling	Poor	
7926-521-1B	Wall Plaster	White	Living Room Wall	Poor	
7926-521-2A	Linoleum	Tan	1st Floor Kitchen	Poor	
7926-521-3A	Drywall Joint Compound	White	1st Floor Kitchen wall Patch	Poor	
7926-521-3B	Drywall Joint Compound	White	Kitchen South Wall	Poor	
7926-521-4A	Ceiling Tile	White	Back Bathroom	Poor	
7926-521-5A	Wall Tile	Blue	Back Bathroom Wall	Poor	
7926-521-6A1	Sheet Vinyl	Redish	Back Bathroom	Poor	Layer 1 Sheet Vinyl, Reddish Chrysotile 17% Layer 2 Mastic Brown Chrysotile 5%
7926-521-4A1	Joint Compound	Tan	Back Kitchen	Poor	
7926-521-5A1	Linoleum Flooring	Grey	Back Kitchen	Poor	
7926-521-6A	Sink Coating	Black	Back North Room	Poor	Chrysotile 8%
7926-521-7A	Window Glazing	White	N Side Addition	Poor	
7926-521-7B	Window Glazing	White	N Side Addition (Interior window)	Poor	Chrysotile 3%
7926-521-7C	Window Glazing	White	N Side Addition (Exterior Window)	Poor	
7926-521-8A	Vinyl Sheet Flooring	Pebble	2nd Floor North Bathroom	Poor	
7926-521-9A	Vinyl Sheet Flooring	Brown	2nd Floor Kitchen	Poor	Layer 1 Sheet Vinyl, Brown Chrysotile 17% Layer 2 Mastic Yellow Chrysotile 5%
7926-521-10A	Plaster	Yellowish	2nd Floor Kitchen	Poor	
7926-521-11A	Sink Coating	Black	2nd Floor Kitchen	Poor	Chrysotile 5%
7926-521-12A	Vinyl Sheet Flooring	Yellow	2nd Floor SE Bathroom	Poor	Layer 1 Sheet Vinyl,Yellow Chrysotile 17% Layer 2 Mastic Lt. grey Chrysotile 3%
7926-521-13A	Pipe Insulation (Aircell)	Whiteish	Basement	Poor	Layer 1: Chrysotile 85% Layer 2: None Detected Layer 3: None Detected Layer 4: None Detected
7926-521-13B	Pipe Insulation Coating	Yellow	Basement	Poor	Chrysotile 5%

Sample No	Material	Color	Location	Current Condition	Results
7926-521-14A	Chimney Flashing	Grey	Roof	Poor	Layer 1: Chimney Flashing, Grey Chrysotile 5% Layer 2: Felt Black: None Detected
7926-521-15A	Chimney Caulking	Dark Grey	Roof	Poor	
7926-521-16A	Shingle	Grey & Black	Roof	Poor	

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0354022

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/10/2026
	WATERLOO, IA 50703	Date Analyzed:	07/13/2026
Collected:	07/09/2026	Date Reported:	07/13/2026
Project Name:	CITY OF WATERLOO	Submitted By:	BRENT SCHREIBEL
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0354022-001 7926-521-1A	LIVING ROOM	LAYER 1 Plaster/ Drywall, Lt. Gray/ Brown	No	None Detected	Cellulose Fiber Gypsum Quartz Non-Fibrous Binder/Filler	10% 90%
		LAYER 2 Wall Paper/ Paint, White Note: Sample is mainly Paint	No	None Detected	Carbonates Non-Fibrous Binder/Filler	 100%
0354022-002 7926-521-1B	LIVING ROOM	LAYER 1 Wall Plaster-Scratch Coat, Beige	No	None Detected	Hair Gypsum Quartz Non-Fibrous Binder/Filler	<1% 99%
		LAYER 2 Wall Plaster-Finish Coat, White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%
0354022-003 7926-521-2A	1ST FLOOR KITCHEN	LAYER 1 Linoleum, Tan	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 2 Mastic, Beige	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	1% 99%

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Laboratory Report
0354022

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/10/2026
	WATERLOO, IA 50703	Date Analyzed:	07/13/2026
Collected:	07/09/2026	Date Reported:	07/13/2026
Project Name:	CITY OF WATERLOO	Submitted By:	BRENT SCHREIBEL
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0354022-004 7926-521-3A	1ST FLOOR KITCHEN	LAYER 1 Drywall, Off White/ Brown	No	None Detected	Cellulose Fiber 10% Fibrous Glass 2% Gypsum Quartz Non-Fibrous Binder/Filler 88%
		LAYER 2 Joint Compound, White/ Off White	No	None Detected	Carbonates Mica Perlite Non-Fibrous Binder/Filler 100%
0354022-005 7926-521-3B	KITCHEN	Drywall Joint Compound, Beige/ Lt. Gray	No	None Detected	Carbonates Perlite Non-Fibrous Binder/Filler 100%
0354022-006 7926-521-4A	BACK BATHROOM	Ceiling Tile, White/ Beige	No	None Detected	Cellulose Fiber 40% Mineral Wool 40% Carbonates Perlite Non-Fibrous Binder/Filler 20%
0354022-007 7926-521-5A	BACK BATHROOM	LAYER 1 Wall Tile, Dk. Green	No	None Detected	Gypsum Quartz Non-Fibrous Binder/Filler 100%
		LAYER 2 Mastic, Cream	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0354022-008 7926-521-6A1	BACK BATHROOM	LAYER 1 Sheet Vinyl, Reddish	Yes	Chrysotile	17%	Cellulose Fiber	3%
						Carbonates Quartz Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Brown	Yes	Chrysotile	5%		
						Carbonates Quartz Non-Fibrous Binder/Filler	95%
0354022-009 7926-521-4A1	BACK KITCHEN	Joint Compound, Tan/ White	No	None Detected			
						Carbonates Perlite Non-Fibrous Binder/Filler	100%
0354022-010 7926-521-5A1	BACK KITCHEN	LAYER 1 Linoleum Flooring, Gray/ Lt. Pink	No	None Detected		Fibrous Glass	5%
						Foam Carbonates Non-Fibrous Binder/Filler	95%
		LAYER 2 Mastic, Clear	No	None Detected		Cellulose Fiber	1%
						Carbonates Quartz Non-Fibrous Binder/Filler	99%
0354022-011 7926-521-6A	BACK NORTH ROOM	Sink Coating, Black	Yes	Chrysotile	8%		
						Carbonates Quartz Non-Fibrous Binder/Filler	92%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0354022-012 7926-521-7A	N SIDE ADDITION	Window Glazing, White/ Lt. Gray	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
0354022-013 7926-521-7B	N SIDE ADDITION	Window Glazing, White/ Beige	Yes	Chrysotile	3%	Carbonates Quartz Non-Fibrous Binder/Filler	97%
0354022-014 7926-521-7C	N SIDE ADDITION	Window Glazing, White/ Lt. Gray	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
0354022-015 7926-521-8A	2ND FLOOR NORTH BATHROOM	LAYER 1 Vinyl Sheet Flooring, Pebble Pattern	No	None Detected		Cellulose Fiber Synthetic Fiber Fibrous Glass Wollastonite Carbonates Quartz Non-Fibrous Binder/Filler	10% 5% 3% 2% 80%
		LAYER 2 Mastic, Yellow	No	None Detected		Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	1% 99%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0354022-016 7926-521-9A	2ND FLOOR KITCHEN	LAYER 1 Vinyl Sheet Flooring, Brown	Yes	Chrysotile	17%	Cellulose Fiber	3%
						Carbonates Quartz Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Yellow	Yes	Chrysotile	5%		
						Carbonates Quartz Non-Fibrous Binder/Filler	95%
0354022-017 7926-521-10A	2ND FLOOR KITCHEN	LAYER 1 Plaster-Scratch Coat, Lt. Beige	No	None Detected			
						Gypsum Quartz Perlite Non-Fibrous Binder/Filler	100%
		LAYER 2 Plaster-Finish Coat, Yellowish/ Beige	No	None Detected			
						Quartz Gypsum Non-Fibrous Binder/Filler	100%
0354022-018 7926-521-11A	2ND FLOOR KITCHEN	Sink Coating, Black	Yes	Chrysotile	5%		
						Carbonates Quartz Non-Fibrous Binder/Filler	95%

AETA
ADVANCED ENVIRONMENTAL
TESTING AND ABATEMENT, INC.

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Laboratory Report
0354022

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0354022-019 7926-521-12A	2ND FLOOR SE BATHROOM	LAYER 1 Vinyl Sheet Flooring, Yellow	Yes	Chrysotile	17%	Cellulose Fiber	3%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Lt. Gray	Yes	Chrysotile	3%		
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	97%
0354022-020 7926-521-13A	BASEMENT	LAYER 1 Pipe Insulation (Aircell), White/sh	Yes	Chrysotile	85%	Cellulose Fiber	10%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	5%
		LAYER 2 Pipe Insulation (Aircell), White/sh	No	None Detected		Cellulose Fiber	97%
						Synthetic Fiber	1%
						Carbonates	
						Non-Fibrous Binder/Filler	2%
		LAYER 3 Pipe Insulation (Aircell), White/sh	No	None Detected		Cellulose Fiber	90%
						Synthetic Fiber	5%
						Carbonates	
						Non-Fibrous Binder/Filler	5%
		LAYER 4 Pipe Insulation (Aircell), White/sh	No	None Detected		Cellulose Fiber	98%
						Carbonates	
						Non-Fibrous Binder/Filler	2%
0354022-021 7926-521-13B	BASEMENT	Pipe Insulation Coating, Yellow/ Beige	Yes	Chrysotile	5%		
						Gypsum	
						Quartz	
						Non-Fibrous Binder/Filler	95%

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Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0354022-022 7926-521-14A	ROOF	LAYER 1 Chimney Flashing, Gray	Yes	Chrysotile	5%		
						Carbonates Quartz Non-Fibrous Binder/Filler	95%
		LAYER 2 Felt, Black	No	None Detected		Cellulose Fiber	40%
						Carbonates Quartz Non-Fibrous Binder/Filler	60%
0354022-023 7926-521-15A	ROOF	Chimney Caulking, Dk. Gray	No	None Detected		Cellulose Fiber	10%
						Carbonates Quartz Non-Fibrous Binder/Filler	90%
0354022-024 7926-521-16A	ROOF	Shingle, Gray/ Black	No	None Detected		Cellulose Fiber	20%
						Carbonates Quartz Non-Fibrous Binder/Filler	80%

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Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

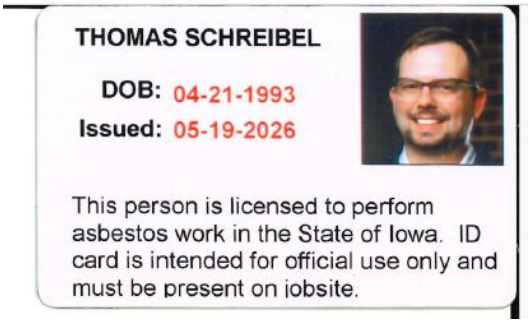
Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents

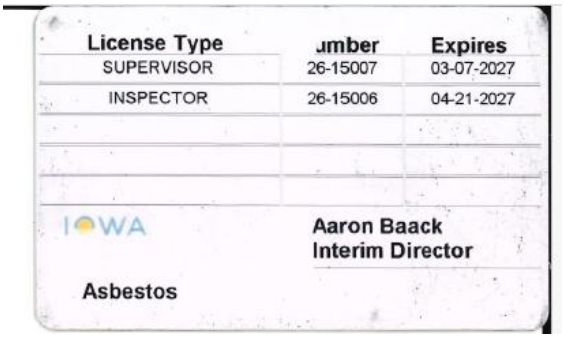
Analyst - Ramon Suarez

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION





APPENDIX C
PICTURES



7926-521-1A,Plaster with Wallpaper
7926-521-1B,Wall Plaster



7926-521-2A,Linoleum



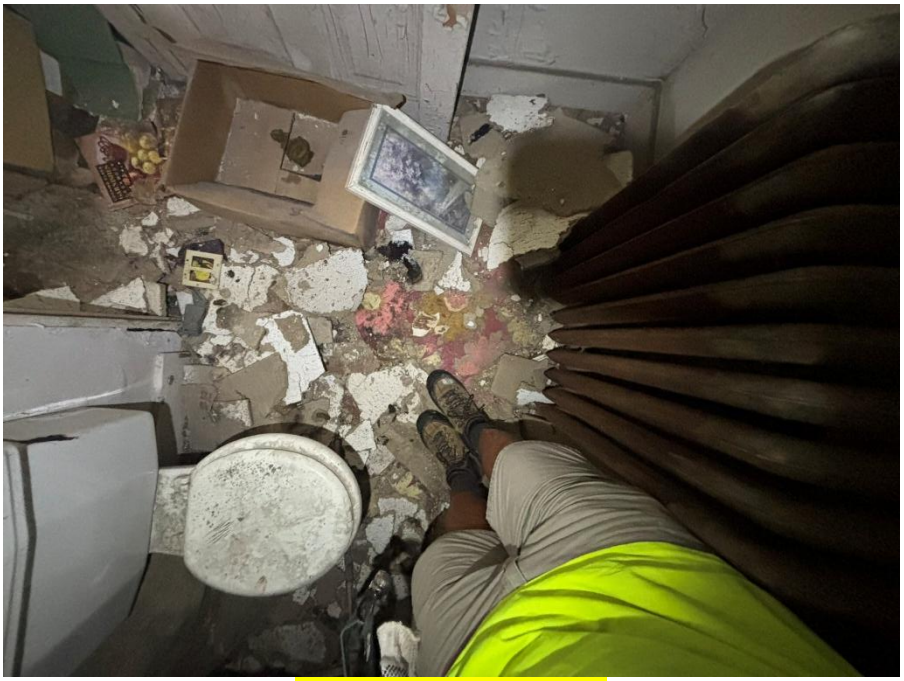
7926-521-3A,Drywall Joint Compound



7926-521-4A,Ceiling Tile



7926-521-5A,Wall Tile



7926-521-6A1,Sheet Vinyl



7926-521-4A1,Joint Compound



7926-521-5A1,Linoleum Flooring



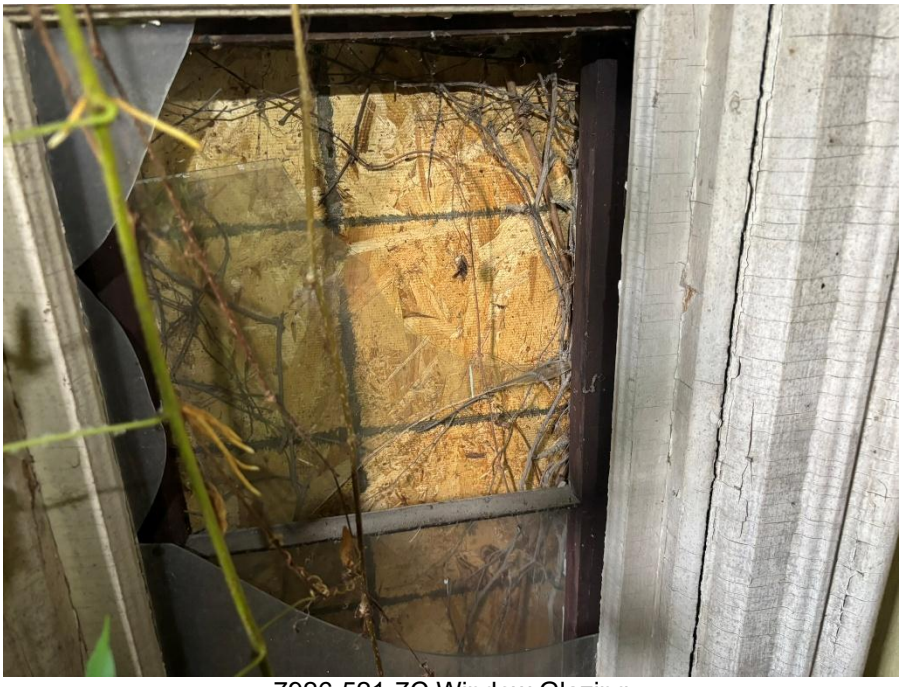
7926-521-6A,Sink Coating



7926-521-7A,Window Glazing



7926-521-7B,Window Glazing



7926-521-7C,Window Glazing



7926-521-8A,Vinyl Sheet Flooring



7926-521-9A,Vinyl Sheet Flooring



7926-521-12A,Vinyl Sheet Flooring



7926-521-13A,Pipe Insulation (Aircell)

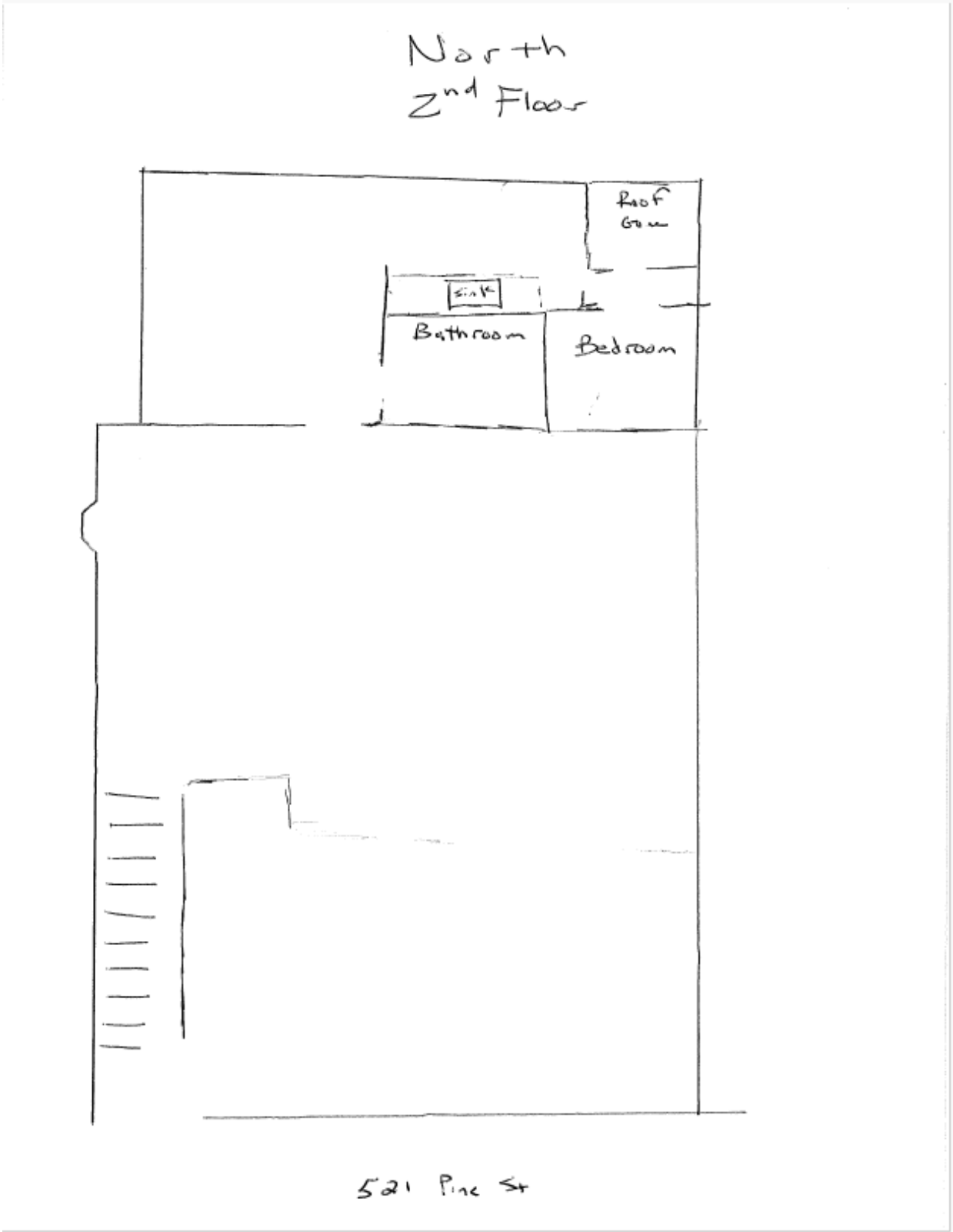


7926-521-13B,Pipe Insulation Coating

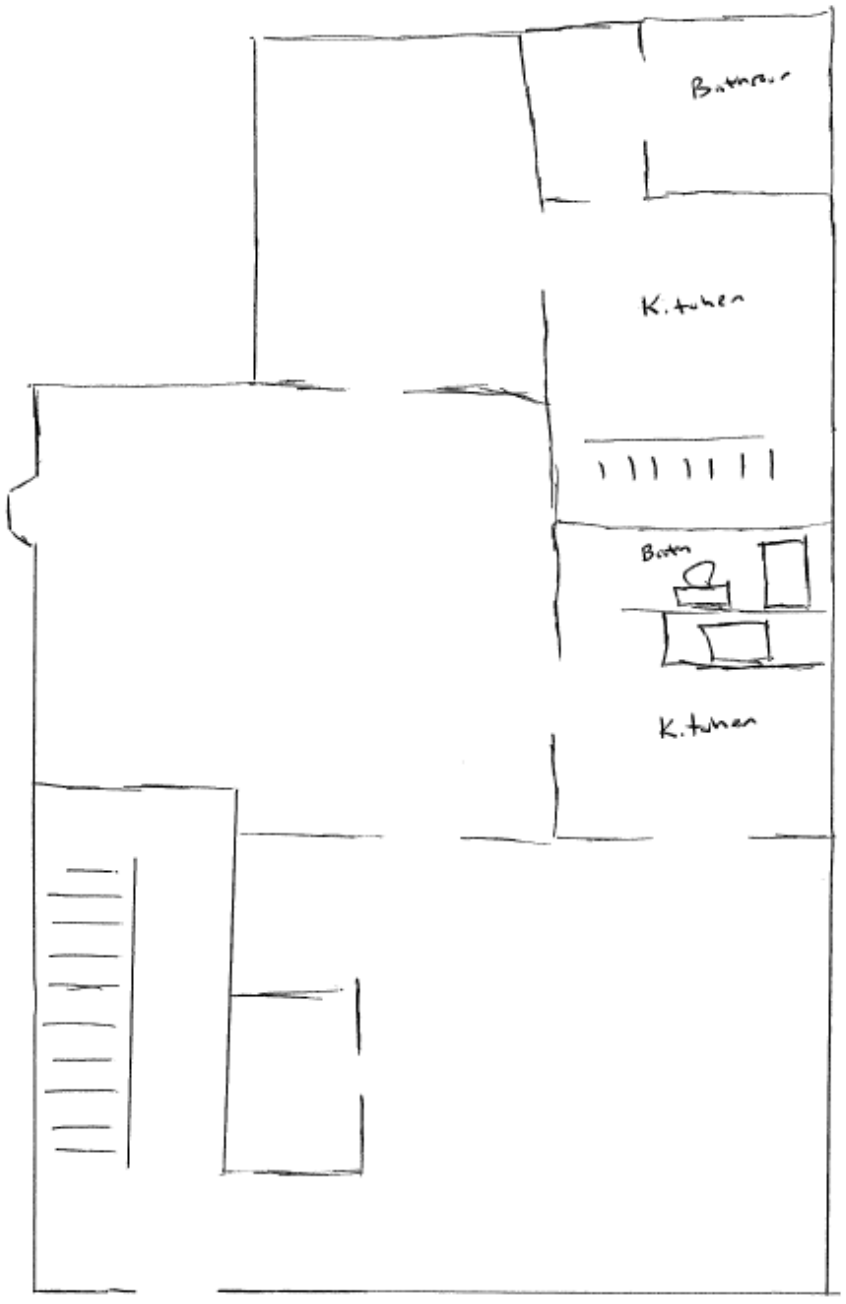


7926-521-14A,Chimney Flashing

APPENDIX D: FLOORPLAN

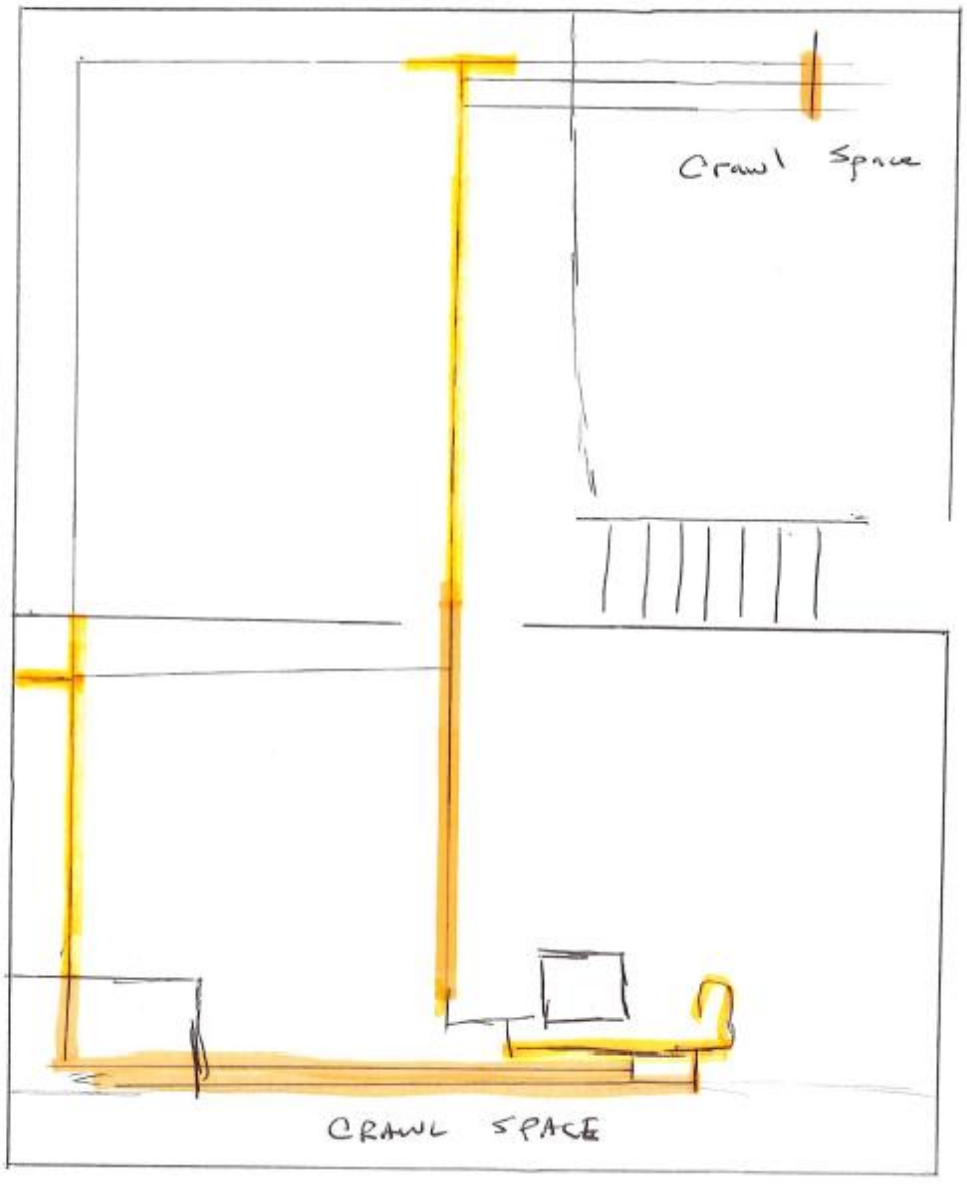


North - 1st Floor



521 Pine St -

North



521 Pine St. Basement

ASBESTOS INSPECTION REPORT

Inspection Address:

City Of Waterloo
314 Rebar Ave.
Waterloo, IA 50701

Project #: 26-30948



Prepared for:

Aric Schroeder
Community Planning and Development
715 Mulberry St.

Prepared by:

Thomas Brent Schreibel

Thomas Brent Schreibel

7/20/2026
Date

26-15006
Inspector #

4/21/2027
License Expiration date

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SECTION 1

INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspected Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (I) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packaging, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials, i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspected asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility of these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms, i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspected ACM.

3. **Debris: In** areas where damaged ACM may be found there may and usually will be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

6. **In the Inspection Report,** certain items such as mudded joints (MJ) or metal doors (MD), etc. are listed as units or number of units, i.e. 10 MJ, 3 Damaged, which is an indication of count rather than square feet or linear feet. Most materials listed in the assessment are either listed as square feet or linear feet with these noted exceptions.

7. **In the Assessment Process,** there are additional codes such as ME and MG; ME representing miscellaneous electrical and MG representing miscellaneous gasket materials. Both codes are used to indicate materials that are unusual to the normal course of an assessment of the building. Miscellaneous electrical materials include old electrical wiring, switchboards, transite panels, etc. Miscellaneous gasket materials can be found between (thermal) valves, on boiler doors, between fittings, between molds, etc. These codes give the Inspector the ability to qualify materials, which sometimes may not be considered as ACM.

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16. Flat roofs: If any layer of a flat roof tests positive for asbestos, all layers should be considered asbestos and removed as such. Advanced Environmental makes

every effort to core roof samples through all layers. If flashing is identified as asbestos containing, all tar on walls and adjacent roof decks shall be bid as and treated as asbestos containing unless separately and disproved by the abatement contractor.

17. Prior to the start of any demolition, have the demolition contractor review the asbestos inspection report, do a building walk through and sign that he agrees with the report and sees no questionable items. If any suspect material is discovered during the demolition, the demolition contractor shall stop immediately and inform the building owner of the suspect materials.

18. If asbestos containing materials are found during demolition:
    1: Stop demolition
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Options for handling found asbestos during demolition activities:

1: Have the inspector stay on site and direct what ACM (RACM) should go as RACM or what they want to go as regular construction waste.
2: Least logical: Most Expensive: Treat all waste as RACM. This isn't necessary in most cases. Demolition contractors have the most to gain in this option.

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ASBESTOS CODES

A = Assumed
ADH = Adhesive
APW = Air Cell Pipe Wrap
BP = Boiler Plaster
C = Ceiling
CAPS = Stair Treads
CQ = Can't Quantify
CT = Ceiling Tiles
CT/12 = 12" Ceiling Tiles
DAM. = Damaged
DEB = Debris
DW = Drywall
F = Friable
FE = Furnace Exhaust
FT = Floor Tiles
GASK = Gaskets
GYM = Gypsum
HOMO = Homogeneous
LINO = Linoleum
MISC = Miscellaneous Non-Friable
MAC = Metal Asbestos Chimney
MATL DESC = Material Description
MD = Metal Door
ME = Miscellaneous Electrical
MF = Miscellaneous Friable
MJ = Mudded Joint
NC = Nose Cap
NF = Non-friable
NSM = Not Suspect Material
P or PH = Previous History
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PSA = Sand Plaster
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1. All Metal Doors are listed by quantities, example 3 = 3 metal doors.
2. All Mudded Joints are listed by quantities of MJ, not sizes.
3. All Pipe Wrap materials are listed in linear feet.
4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
   Y = Considered Asbestos Containing Material
   P or PH = Previous History
   N/A = Not Analyzed
   <1% = Contains less than 1% Asbestos Containing Material
   >1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non-Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non-Friable ACM.

SECTION 4

ASBESTOS INSPECTION REPORT SUMMARY

METHOD:

All collected samples were submitted to EMC LABS, INC., located in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP #101926-0) for Polarized Light Microscopy (PLM) analysis. The sampling was conducted by a State of Iowa licensed asbestos inspector and followed the National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos-containing materials (ACMs) were analyzed using EPA Method 600-R93-116 via PLM.

OVERVIEW:

Advanced Environmental Testing and Abatement, Inc. performed an Asbestos Containing Materials (ACM) Inspection on June 26th 2026. The purpose of this inspection was to identify the presence of asbestos-containing materials prior to the future demolition of the building.

- **Property Description:**
  - Residence at 314 Rebar Ave.
- **Occupancy Status at Time of Inspection:** Vacant
- **Scope of Inspection:** Asbestos Inspection Prior to Demolition

RESULTS:

- **Total Bulk Samples Collected:** Twenty Four (24)
- **Asbestos Detected:** Five (5)

All building materials similar in appearance, color, and/or texture to those determined to contain asbestos must be assumed to contain asbestos throughout the building.

SECTION 5

POSITIVE MATERIALS:

The following samples tested positive (>1%) for asbestos or are assumed to contain asbestos:

Material	Color	Location	Current Condition	Results	Quantity
Shingle with Roofing Tar	Black, Green	Roof	Poor	Roofing Tar Chrysotile 8%	20 Sq Ft
Refractory Cement	Grey	Basement	Good	Chrysotile 3% Amosite 2%	5 Sq Ft
Duct paper	White	Upstairs register	Poor	Chrysotile 85%	50 Sq Ft
Window Glazing	White	South Bedroom	Good	Chrysotile 3%	20 Sq Ft (17 Windows)
Flashing Tar	Black	Above Back Door	Good	Chrysotile 8%	5 Ln Ft

REGULATION REVIEW

The United State Environmental Protection Agency definition of asbestos containing materials (ACM) is a material with an asbestos content greater than 1%. According to Iowa Division of Labor, ACM is any material found to contain asbestos, regardless of its concentration. Materials containing asbestos containing <1% asbestos still have some Division of Labor regulations overseeing removal of the material.

CONCLUSIONS AND RECOMMENDATIONS

The results of laboratory testing during the asbestos renovations contained Five (5) positive samples out of taken for asbestos in one homogenous material.

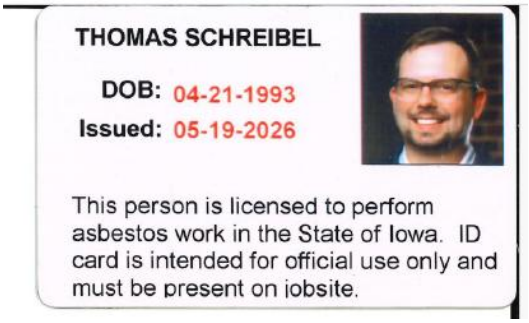
Advanced Environmental Testing and Abatement, Inc. make the following recommendations and conclusions:

1: Removal of all asbestos containing materials prior to demolition by a Permitted asbestos company with the Iowa Department of Inspections, Appeals, and Licensing.

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Sample No	Material	Color	Location	Current Condition	Results
7926-314-1A	Flashing Tar	Black	Roof	Poor	
7926-314-2A	Shingle	Green, Brown	Roof	Poor	
7926-314-2B	Shingle	Green, Grey, Brown	Roof	Poor	
7926-314-3A	Shingle with Roofing Tar	Black, Green	Roof	Poor	Roofing Tar Chrysotile 8%
7926-314-4A	Sheet Vinyl	White/Blue	Back Stairs Entrance	Good	
7926-314-5A	Plaster & texture	White	Back Stairs Entrance	Good	
7926-314-6A	12x12 ceiling tile	White	Basement	Poor	
7926-314-7A	Kiln Blocks	Yellow	Basement	Good	
7926-314-7B	Kiln Blocks	Yellow	Basement	Good	
7926-314-8A	Refractory Cement	Grey	Basement	Good	Chrysotile 3% Amosite 2%
7926-314-9A	Sheet Vinyl	Tan	Kitchen Flooring	Good	
7926-314-10A	Ceiling Tile	White	Kitchen	Poor	
7926-314-11A	Ceiling Tile	White	Living Room	Poor	
7926-314-12A	Flooring Tile Entry	Tan	Entryway	Good	
7926-314-13A	Plaster	White	Entryway	Poor	
7926-314-13B	Plaster	White	Upstairs Bedroom	Poor	
7926-314-14A	Duct paper	White	Upstairs register	Poor	Crysotile 85%
7926-314-15A	Wall Tile	White/Yellow	Bathroom 2nd floor	Good	
7926-314-16A	Shower Surround Adhesive	White/Yellow	Bathroom 2nd floor	Good	
7926-314-16B	Shower Surround Adhesive 2nd layer	Brown/white	Bathroom 2nd floor	Good	
7926-314-17A	Linoleum	Tan/White	Bathroom 2nd floor	Good	
7926-314-18A	Paneling & Texture	White	Bathroom 2nd floor	Good	
7926-314-19A	Window Glazing	White	South Bedroom	Good	Chrysotile 3%
7926-314-20A	Flashing Tar	Black	Above Back Door	Good	Chrysotile 8%

APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION

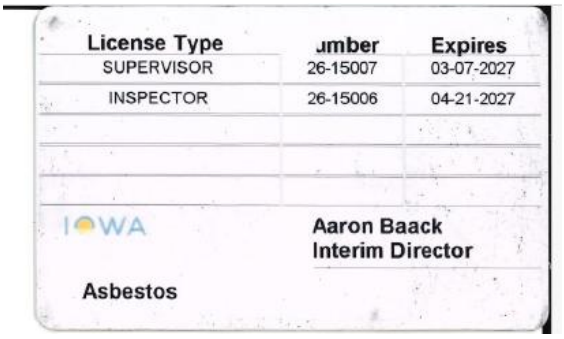


THOMAS SCHREIBEL

DOB: 04-21-1993

Issued: 05-19-2026

This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.



License Type	umber	Expires
SUPERVISOR	26-15007	03-07-2027
INSPECTOR	26-15006	04-21-2027

IOWA

Aaron Baack
Interim Director

Asbestos

APPENDIX C
PICTURES



7926-314-1A Flashing Tar



7926-314-2A Shingle



7926-314-4A Sheet Vinyl



7926-314-5A Plaster & texture



7926-314-6A 12x12 ceiling tile



7926-314-7A Kiln Blocks



7926-314-7B Kiln Blocks



7926-314-9A Sheet Vinyl



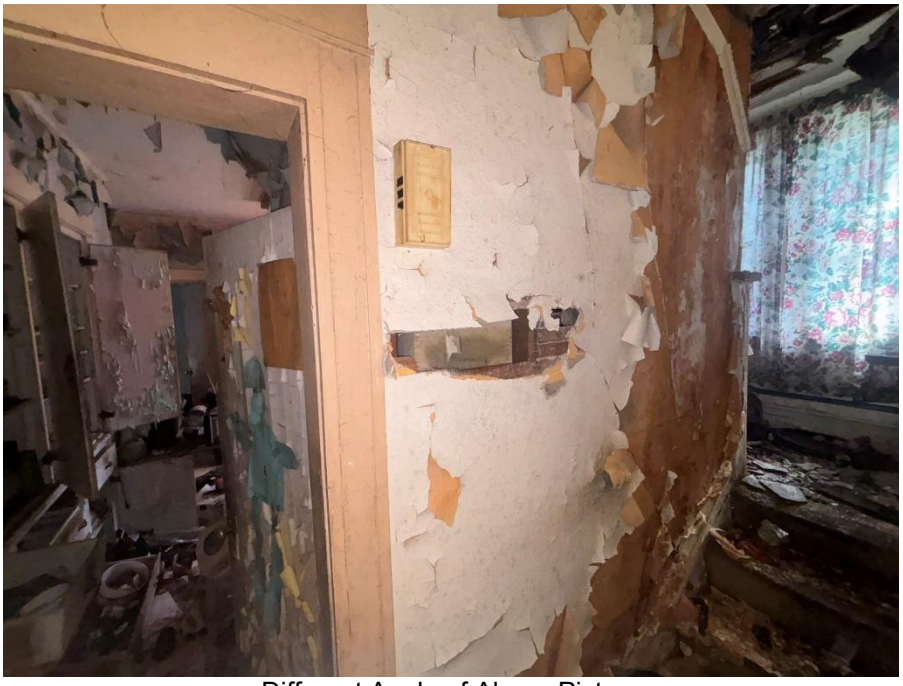
7926-314-10A Ceiling Tile



7926-314-12A Flooring Tile Entry



7926-314-14A Duct paper



Different Angle of Above Picture



7926-314-13A Plaster



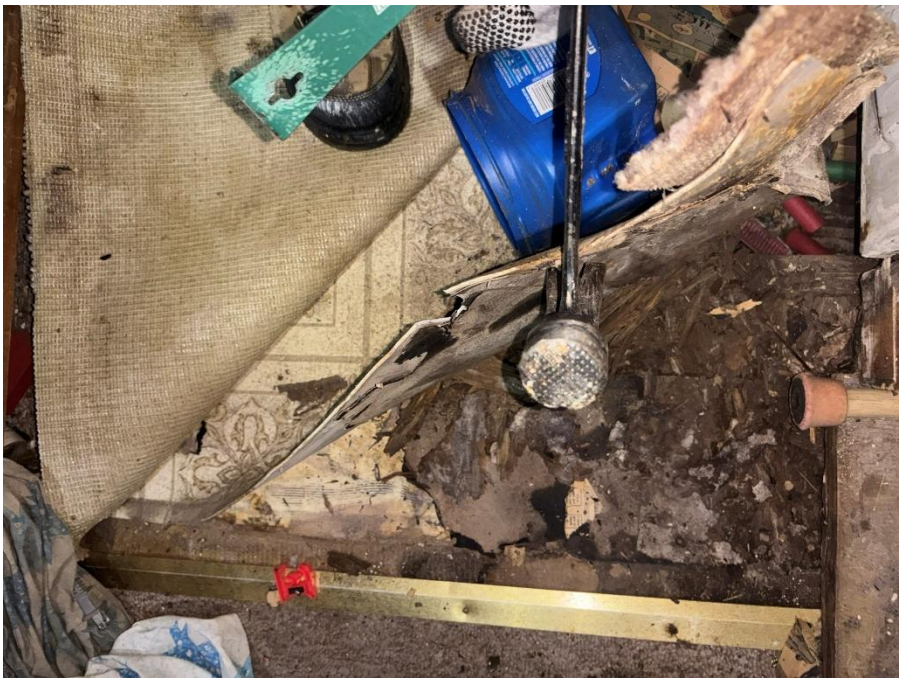
7926-314-15A Wall Tile



7926-314-16A Shower Surround Adhesive



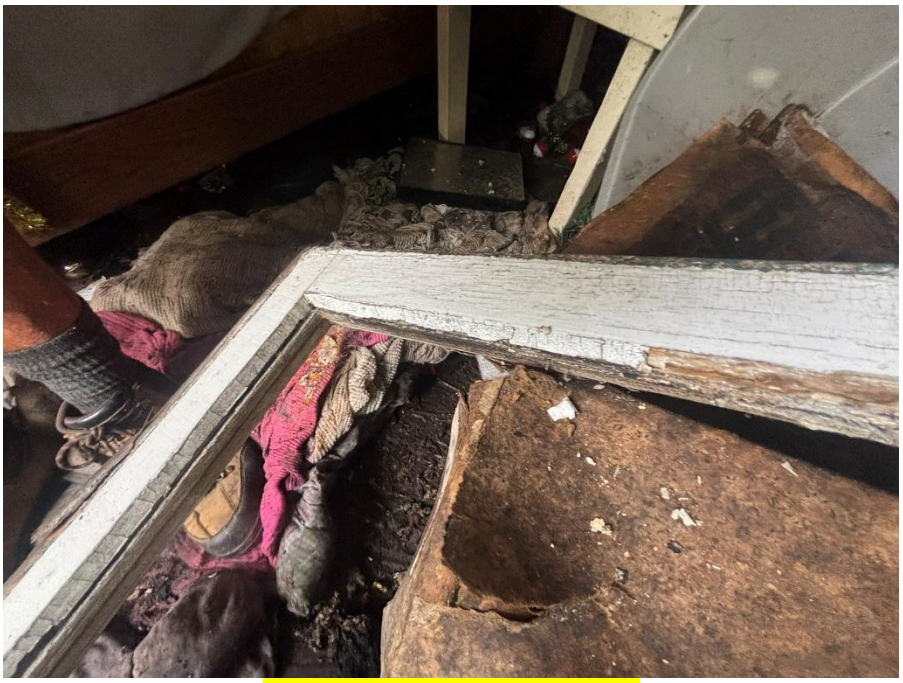
7926-314-16B Shower Surround Adhesive 2nd layer



7926-314-17A Linoleum



7926-314-18A Paneling & Texture

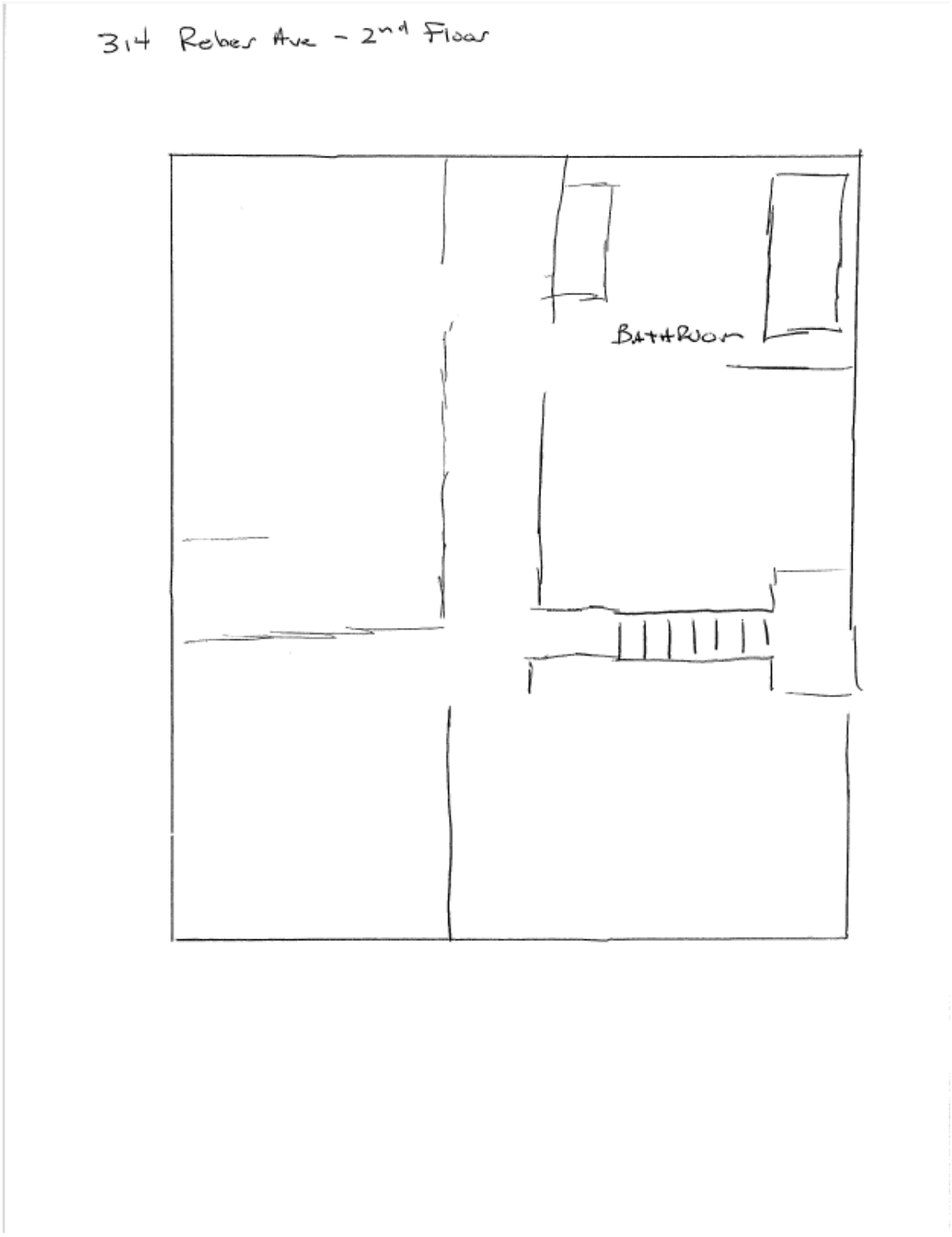


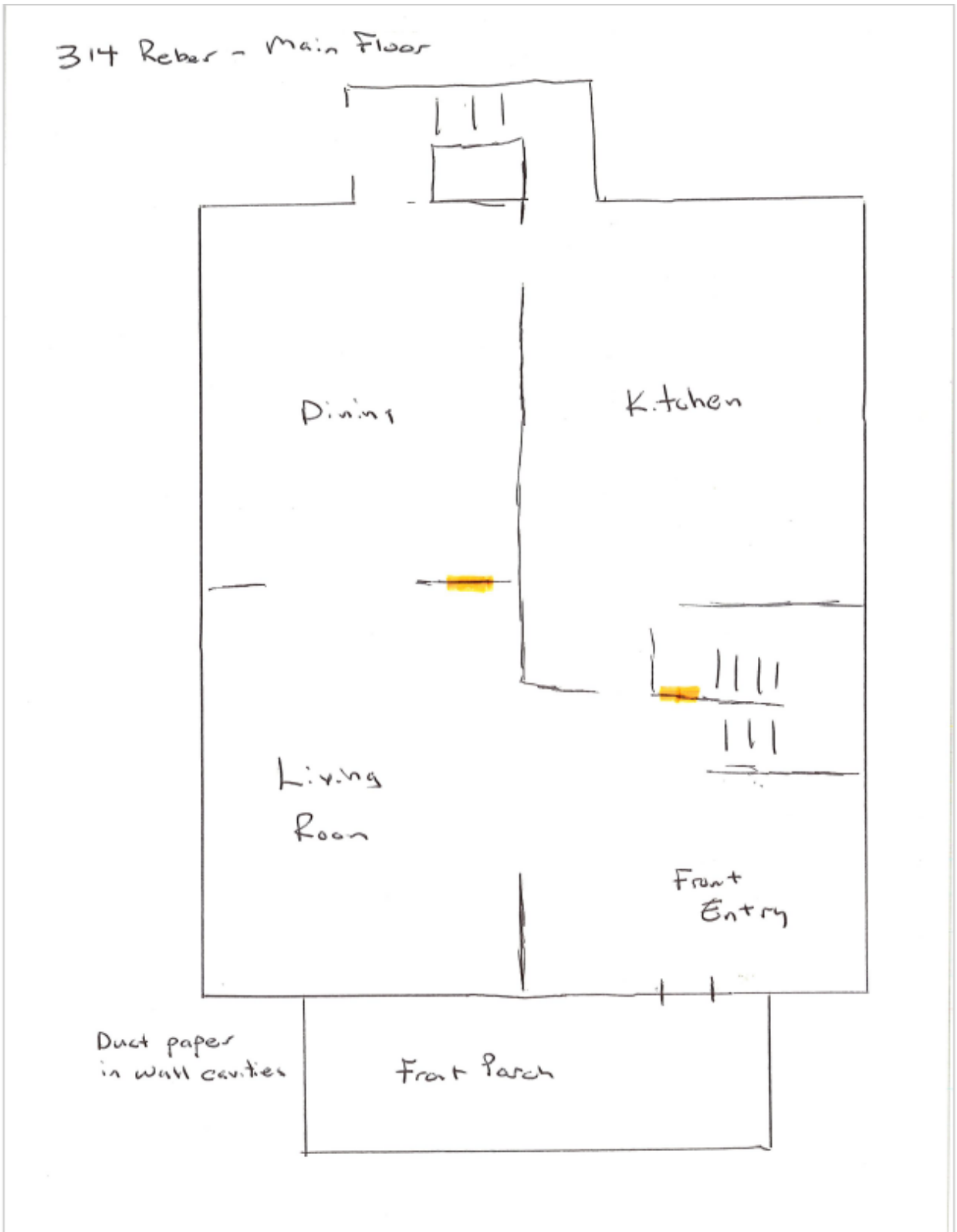
7926-314-19A Window Glazing

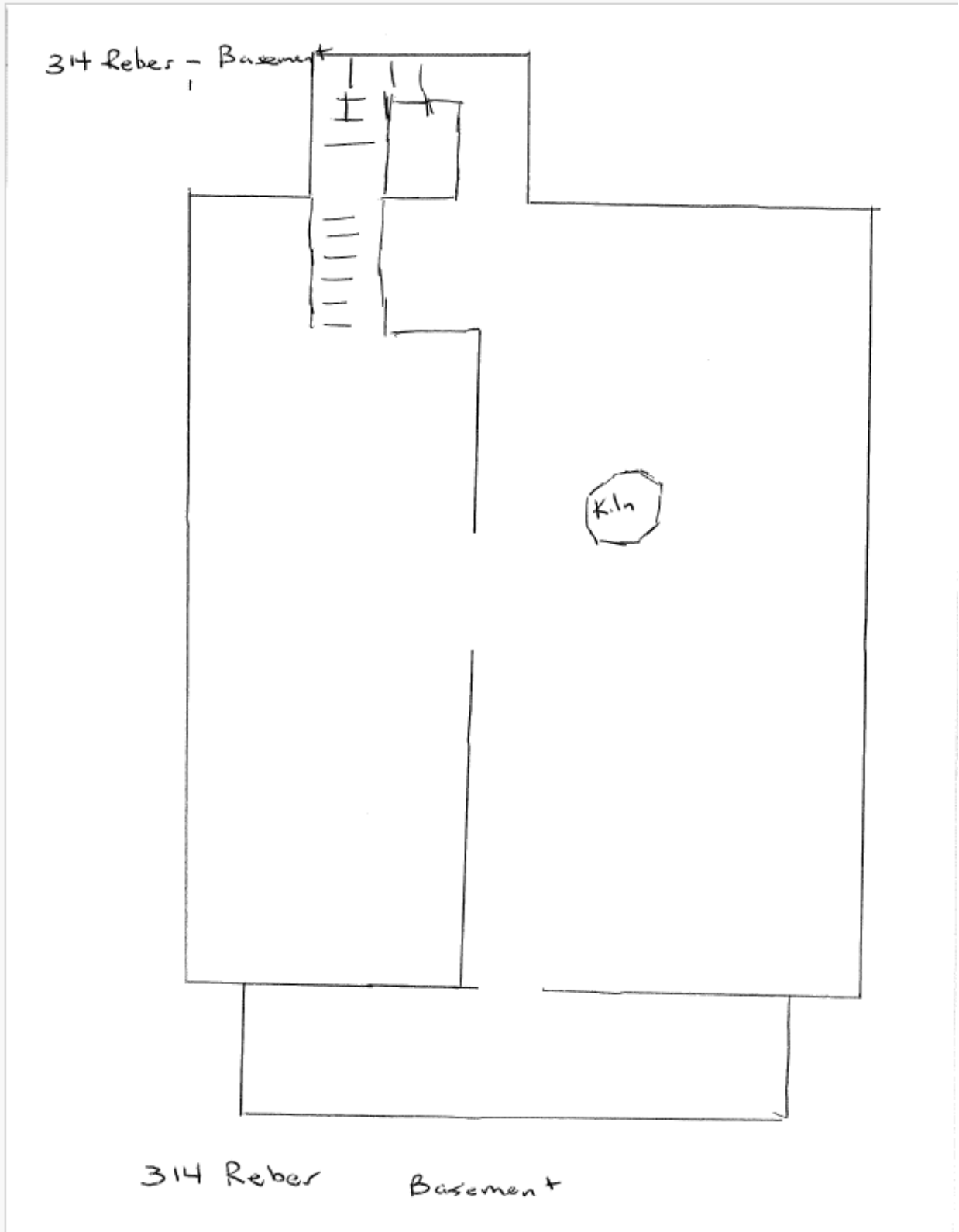


7926-314-20A Flashing Tar

APPENDIX D – FLOORPLAN




314 Rebar - Main Floor
Dining
Kitchen
Living Room
Front Entry
Duct paper in wall cavities
Front Porch


314 Rebes - Basement
Kiln
314 Reber Basement

ASBESTOS INSPECTION REPORT

Inspection Address:

City of Waterloo
Vacant Property
1410 Mulberry St.
Waterloo, IA
Project #: 26-30968

Prepared for:

City of Waterloo
Attn: Aric Schroeder
715 Mulberry St.
Waterloo, IA 50703

Prepared by:

Travis Haas

Travis J. Haas, Inspector

7/16/26
Date

25-13724
Inspector #

8/2/26
License Expiration date

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2. DEFINITIONS

3. GENERAL BUILDING OBSERVATIONS

4. REPORT DATA
    a. METHOD
    b. REPORT DATA

5. PROJECT SUMMARY
    a. POSITIVE ASBESTOS SAMPLE LIST
    b. CONCLUSIONS AND RECOMMENDATIONS

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APPENDIX A - SAMPLE INVENTORY LIST & LAB ANALYSIS

APPENDIX B - INSPECTOR LICENSE AND CERTIFICATION

APPENDIZ C - PICTURES

SECTION 1

INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspected Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (l) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packaging, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials, i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspected asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility of these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms, i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspected ACM.

3. **Debris: In** areas where damaged ACM may be found there may and usually will be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

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HOMO = Homogeneous
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MATL DESC = Material Description
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4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
Y = Considered Asbestos Containing Material
P or PH = Previous History
N/A = Not Analyzed
<1% = Contains less than 1% Asbestos Containing Material
>1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non-Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non-Friable ACM.

SECTION 4

ASBESTOS INSPECTION REPORT SUMMARY

METHOD:

All collected samples were submitted to EMC LABS, INC., located in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP #101926-0) for Polarized Light Microscopy (PLM) analysis. The sampling was conducted by a State of Iowa licensed asbestos inspector and followed the National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos-containing materials (ACMs) were analyzed using EPA Method 600-R93-116 via PLM.

OVERVIEW:

Advanced Environmental Testing and Abatement, Inc. performed an Asbestos Containing Materials (ACM) Inspection on July 1st 2026. The purpose of this inspection was to identify the presence of asbestos-containing materials prior to the future demolition of the residence.

- **Property Description:**
  - Residential house
- **Occupancy Status at Time of Inspection:** Vacant
- **Scope of Inspection:** Total Inspection

RESULTS:

- **Total Bulk Samples Collected:** twenty-eight (28) samples
- **Asbestos Detected:** Four (4) samples with asbestos

All building materials similar in appearance, color, and/or texture to those determined to contain asbestos must be assumed to contain asbestos throughout the building.

SECTION 5

POSITIVE MATERIALS:

The following samples tested positive (>1%) for asbestos or are assumed to contain asbestos:

Material	Color	Location	Results	Quantity
Linoleum Backer	Grey	Landing by kitchen to basement stairs	40% Chrysotile	20 Sq. Ft.
Linoleum/Adhesive	Lt. Tan	Kitchen flooring, bottom layer	3-15% Chrysotile	320 Sq. Ft.
Duct paper	Grey	Basement throughout, one run to second floor	85% Chrysotile	42 Sq. Ft.
Window glazing	White	Basement window	2% Chrysotile	1 Each

REGULATION REVIEW

The United State Environmental Protection Agency definition of asbestos containing materials (ACM) is a material with an asbestos content greater than 1%. According to Iowa Division of Labor, ACM is any material found to contain asbestos, regardless of its concentration. Materials containing asbestos containing <1% asbestos still have some Division of Labor regulations overseeing removal of the material.

CONCLUSIONS AND RECOMMENDATIONS

The results of laboratory testing during the asbestos inspection contained five (5) positive samples for asbestos from four (4) homogenous materials.

Advanced Environmental Testing and Abatement, Inc. make the following recommendations and conclusions:

1: Removal of all asbestos containing materials prior to demolition of the structure.

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Facility Name/Site Location					
			City of Waterloo 1410 Mulberry St Waterloo, IA		**Inspected By:** Travis Haas
Sample No	**Material**	**Color**	**Location**	**Current Condition**	**Results**
M7126-1A	Texture	White	Knock down texture 1st floor room A	Damaged	0%, 0%
M7126-1B	Texture	White	Knock down texture 1st floor room D (kitchen)	Damaged	0%, 0%
M7126-1C	Texture	White	Knock down texture 1st floor room B	Damaged	0%, 0%
M7126-2A	Plaster	Grey	Ceiling in room B	Sign. Damaged	0%, 0%, 0%
M7126-2B	Plaster	Grey	Walls room B	Sign. Damaged	0%, 0%, 0%
M7126-2C	Plaster	Grey	Walls room B	Sign. Damaged	0%, 0%, 0%
M7126-3A	Ceramic tile/grout/mortar	Grey	Bathroom 1st floor	Sign. Damaged	0%, 0%, 0%
M7126-4A	Floor tile	Grey/brown	Bathroom 1st floor two layers	Sign. Damaged	0%, 0%
M7126-5A	Floor tile	Black	Kitchen 1st floor	Sign. Damaged	0%, 0%
M7126-6A	Ceramic tile/grout/mortar	Grey	Kitchen wall behind stove	Damaged	0%, 0%,0%
M7126-7A	Linoleum backer	Grey	Hallway by laundry room and stairs to basement under laminate	Sign. Damaged	40%, 5%
M7126-8A	Drywall/compound	White	Kitchen walls/ceiling	Good	0%, 0%, 0%
M7126-8B	Drywall/compound	White	Front bedroom 1st floor	Good	0%, 0%, 0%
M7126-9A	Linoleum	Lt. Tan	2nd layer flooring in kitchen	Good	15%, 3%
M7126-10A	tar paper	Black	Under flooring in bathroom 1st floor	Good	0%
M7126-11A	Duct paper	Grey	Throughout basement (unknown if in 1st floor walls)	Sign. Damaged	85%
M7126-12A	Floor tile	White	Top of landing 2nd floor	Sign. Damaged	0%, 0%
M7126-13A	Drywall/compound	White	1st bedroom to left, newer drywall	Sign. Damaged	0%, 0%
M7126-14A	Drywall/compound	White	middle room 2nd floor walls	Good	0%, 0%
M7126-14B	Drywall/compound	White	middle room 2nd floor walls	Good	0%, 0%, 0%
M7126-15A	Texture	White	Middle room 2nd floor walls	Good	0%, 0%
M7126-15B	Texture	White	Middle room 2nd floor ceiling	Good	0%
M7126-15C	Texture	White	Middle room 2nd floor ceiling	Good	0%, 0%
M7126-16A	Floor tile	White/blue	Front room 2nd floor	Sign. Damaged	0%, 0%
M7126-17A	Glazing	White	Basement window	Good	2%
M7126-18A	tar	Black	Flat roof top of house	Good	0%, 0%, 0%
M7126-19A	Rolled roofing	Black	Flat roof top of house	Good	0%
M7126-20A	Shingle/tar paper	Black	Main house shingles	Good	0%, 0%, 0%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0353606

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-001 M7126-1A	1ST FLOOR ROOM A	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Texture, Beige/ Off White	No	None Detected		
					Carbonates Quartz Non-Fibrous Binder/Filler	100%
0353606-002 M7126-1B	1ST FLOOR ROOM D (KITCHEN)	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Texture, Beige/ Off White	No	None Detected		
					Carbonates Quartz Non-Fibrous Binder/Filler	100%
0353606-003 M7126-1C	1ST FLOOR ROOM B	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Texture, Beige/ Off White	No	None Detected		
					Carbonates Quartz Non-Fibrous Binder/Filler	100%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-004 M7126-2A	ROOM B	LAYER 1 Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected	Hair Gypsum Quartz Non-Fibrous Binder/Filler	<1% 99%
		LAYER 2 Plaster-Finish Coat, White	No	None Detected	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 3 Plaster Texture, Beige/ Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%
0353606-005 M7126-2B	ROOM B	LAYER 1 Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected	Hair Gypsum Quartz Non-Fibrous Binder/Filler	<1% 99%
		LAYER 2 Plaster-Finish Coat, White	No	None Detected	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 3 Plaster/ Paint, Beige/ Lt. Blue	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	1% 99%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0353606-006 M7126-2C	ROOM B	LAYER 1 Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected	Hair <1% Gypsum Quartz Non-Fibrous Binder/Filler 99%
		LAYER 2 Plaster-Finish Coat, White	No	None Detected	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler 100%
		LAYER 3 Plaster/ Paint, Beige/ Lt. Blue	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
0353606-007 M7126-3A	BATHROOM 1ST FLOOR	LAYER 1 Ceramic Tile, Gray	No	None Detected	Gypsum Quartz Carbonates Non-Fibrous Binder/Filler 100%
		LAYER 2 Grout/ Caulk, Beige/ Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
		LAYER 3 Cement, Gray	No	None Detected	Quartz Gypsum Non-Fibrous Binder/Filler 100%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-008 M7126-4A	BATHROOM 1ST FLOOR	LAYER 1 Floor Tile, Brown/ Gray	No	None Detected		
					Carbonates	
					Quartz	
					Non-Fibrous Binder/Filler	100%
		LAYER 2 Mastic, Clear/ Yellow	No	None Detected	Cellulose Fiber	3%
					Carbonates	
					Quartz	
					Non-Fibrous Binder/Filler	97%
0353606-009 M7126-5A	KITCHEN 1ST FLOOR	LAYER 1 Floor Tile, Black/ Beige/ Off White	No	None Detected		
					Carbonates	
					Quartz	
					Non-Fibrous Binder/Filler	100%
		LAYER 2 Mastic, Clear/ Yellow	No	None Detected	Cellulose Fiber	1%
					Synthetic Fiber	<1%
					Carbonates	
					Quartz	
					Non-Fibrous Binder/Filler	98%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0353606-010 M7126-6A	KITCHEN	LAYER 1 Ceramic Tile, White/ Off White	No	None Detected		Gypsum Quartz Non-Fibrous Binder/Filler	100%
		LAYER 2 Grout/ Mastic, Tan	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
		LAYER 3 Mastic, Tan	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
0353606-011 M7126-7A	HALLWAY BY LAUNDRY ROOM AND STAIRS TO BASEMENT	LAYER 1 Linoleum Backing, Lt. Gray	Yes	Chrysotile	40%	Cellulose Fiber Carbonates Gypsum Non-Fibrous Binder/Filler	10% 50%
		LAYER 2 Mastic, Tan Note: Difficult to separate adjacent layer	Yes	Chrysotile	5%	Carbonates Quartz Non-Fibrous Binder/Filler	95%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-012 M7126-8A	KITCHEN	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber Gypsum Carbonates Non-Fibrous Binder/Filler	10% 90%
		LAYER 2 Joint Compound, Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 3 Texture, Beige/ Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%
0353606-013 M7126-8B	FRONT BEDROOM 1ST FLOOR	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber Gypsum Carbonates Non-Fibrous Binder/Filler	10% 90%
		LAYER 2 Joint Compound, Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%
		LAYER 3 Texture, Beige/ Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler	 100%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0353606-014 M7126-9A	KITCHEN	LAYER 1 Linoleum, Beige/ Lt. Gray	Yes	Chrysotile	15%	Cellulose Fiber	5%
						Carbonates Gypsum Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Tan Note: Difficult to separate adjacent layer	Yes	Chrysotile	3%	Cellulose Fiber	5%
						Carbonates Quartz Non-Fibrous Binder/Filler	92%
0353606-015 M7126-10A	BATHROOM 1ST FLOOR	Tar Paper, Brown/ Black	No	None Detected		Cellulose Fiber	60%
						Carbonates Quartz Non-Fibrous Binder/Filler	40%
0353606-016 M7126-11A	THROUGHOUT BASEMENT	Duct Paper, Gray	Yes	Chrysotile	85%	Cellulose Fiber	5%
						Carbonates Gypsum Non-Fibrous Binder/Filler	10%
0353606-017 M7126-12A	TOP OF LANDING 2ND FLOOR	LAYER 1 Floor Tile, Off White/ Beige	No	None Detected			
						Carbonates Quartz Non-Fibrous Binder/Filler	100%
		LAYER 2 Mastic, Clear/ Yellow	No	None Detected		Cellulose Fiber	3%
						Carbonates Quartz Non-Fibrous Binder/Filler	97%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-018 M7126-13A	1ST BEDROOM TO LEFT	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Joint Compound, Off White	No	None Detected		
					Carbonates Perlite Non-Fibrous Binder/Filler	100%
0353606-019 M7126-14A	MIDDLE ROOM 2ND FLOOR	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Texture, Beige/ Off White	No	None Detected		
					Carbonates Perlite Non-Fibrous Binder/Filler	100%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-020 M7126-14B	MIDDLE ROOM 2ND FLOOR	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Joint Compound, Off White	No	None Detected	Fibrous Glass	2%
					Carbonates Perlite Non-Fibrous Binder/Filler	98%
		LAYER 3 Texture, Beige/ Off White	No	None Detected	Fibrous Glass	5%
					Carbonates Perlite Non-Fibrous Binder/Filler	95%
0353606-021 M7126-15A	MIDDLE ROOM 2ND FLOOR	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber	10%
					Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Texture, Beige/ Off White	No	None Detected	Carbonates Perlite Non-Fibrous Binder/Filler	100%
0353606-022 M7126-15B	MIDDLE ROOM 2ND FLOOR	Texture, Beige/ Off White	No	None Detected	Carbonates Perlite Non-Fibrous Binder/Filler	100%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0353606-023 M7126-15C	MIDDLE ROOM 2ND FLOOR	LAYER 1 Drywall, White/ Brown	No	None Detected		Cellulose Fiber	10%
						Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Texture, Beige/ Off White	No	None Detected		Carbonates Perlite Non-Fibrous Binder/Filler	100%
0353606-024 M7126-16A	FRONT ROOM 2ND FLOOR1	LAYER 1 Floor Tile, Beige/ Blue/ Black	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
		LAYER 2 Mastic, Clear/ Yellow	No	None Detected		Cellulose Fiber Synthetic Fiber	1% <1%
						Carbonates Quartz Non-Fibrous Binder/Filler	98%
0353606-025 M7126-17A	BASEMENT	Glazing, Beige/ Lt. Gray	Yes	Chrysotile	2%	Carbonates Quartz Non-Fibrous Binder/Filler	98%

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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0353606-026 M7126-18A	ROOF TOP OF HOUSE	LAYER 1 Tar Paper, Black	No	None Detected	Fibrous Glass	30%
					Carbonates Quartz Non-Fibrous Binder/Filler	70%
		LAYER 2 Tar Paper, Black	No	None Detected	Fibrous Glass	30%
					Carbonates Quartz Non-Fibrous Binder/Filler	70%
		LAYER 3 Tar Paper, Black	No	None Detected	Fibrous Glass	30%
					Carbonates Quartz Non-Fibrous Binder/Filler	70%
0353606-027 M7126-19A	ROOF TOP OF HOUSE	Rolled Roofing Mastic, Black	No	None Detected	Cellulose Fiber	5%
					Carbonates Quartz Non-Fibrous Binder/Filler	95%
0353606-028 M7126-20A	MAIN HOUSE	LAYER 1 Shingle, Gray/ Black	No	None Detected	Fibrous Glass	20%
					Carbonates Quartz Non-Fibrous Binder/Filler	80%
		LAYER 2 Shingle, Beige/ Gray/ Black	No	None Detected	Fibrous Glass	20%
					Carbonates Quartz Non-Fibrous Binder/Filler	80%
		LAYER 3 Tar Paper, Black	No	None Detected	Cellulose Fiber	60%
					Carbonates Quartz Non-Fibrous Binder/Filler	40%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0353606

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30948
Address:	803 RICKER ST	Date Received:	07/02/2026
	WATERLOO, IA 50703	Date Analyzed:	07/06/2026
Collected:	07/01/2026	Date Reported:	07/06/2026
Project Name:	CITY OF WATERLOO	Submitted By:	TRAVIS HAAS
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents

Analyst - Matt Kettler

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION

Certificate No: 5LW08012508AIR
Issue Date: August 4, 2025
Expiration Date: August 1, 2026



This diploma is awarded to

Travis J. Haas

For successfully completing and passing the examination for the

ASBESTOS INSPECTOR

REFRESHER TRAINING COURSE

This training course complies with the requirements of TSCA Title II and is accredited by the State of Wisconsin, Department of Health Services, under chapter DHS 159, Wis. Admin. Code, conducted by

Lake States Environmental, Ltd.

Attended Remotely on August 1, 2025

Examination Date: August 1, 2025

Lake States Environmental, Ltd.
P. O. Box 645, Rice Lake, WI 54868
www.lakestates.com
(800) 254-9811

Grant J Grassle

Grant Grassle - Training Instructor

TRAVIS HAAS

DOB: 01-09-1982

Issued: 08-07-2025



This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
SUPERVISOR	25-13616	06-27-2026
INSPECTOR	25-13724	08-01-2026

IOWA

Asbestos

Larry Johnson, Jr.
Labor Commissione

APPENDIX C
PICTURES

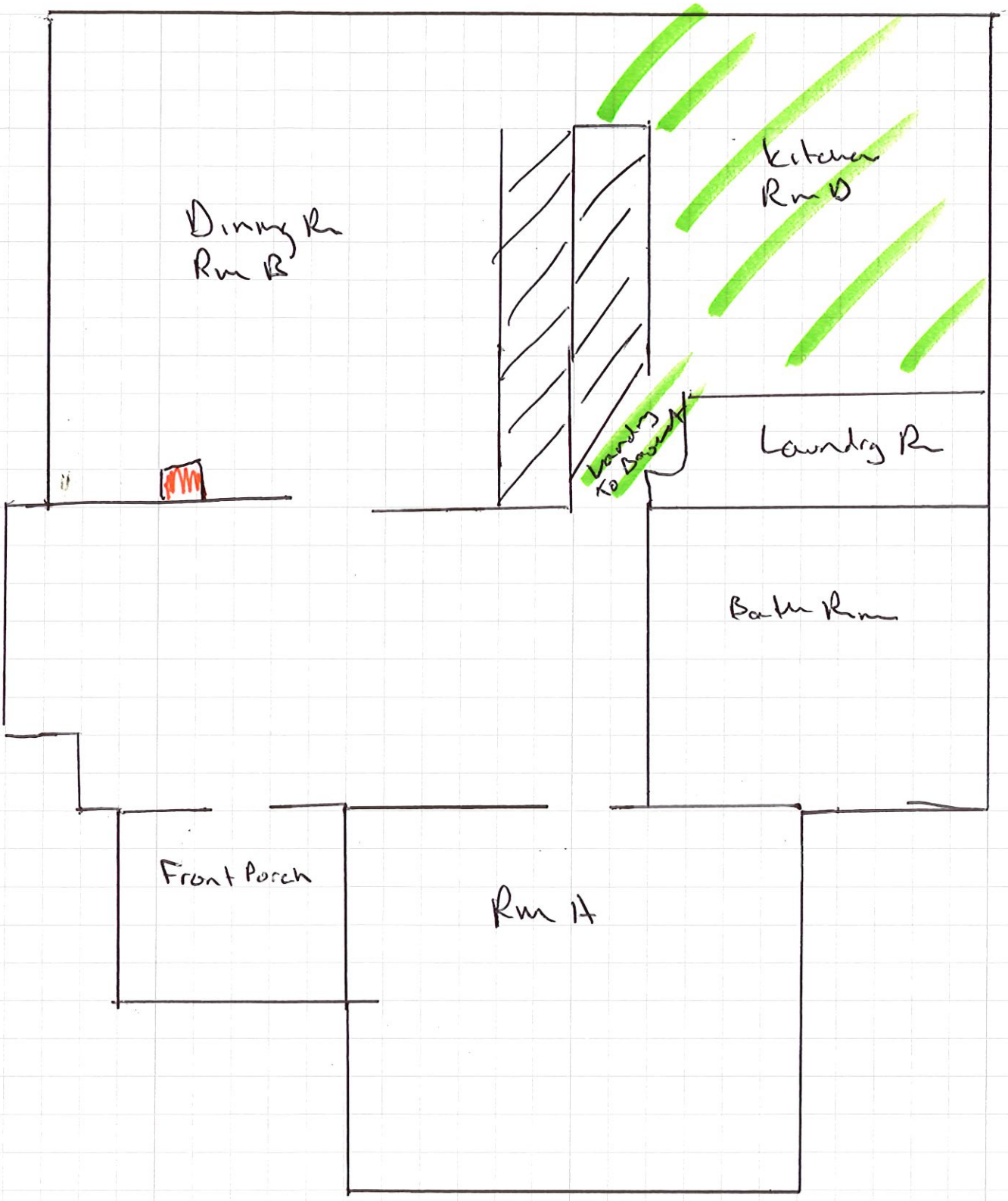
ADVANCED ENVIRONMENTAL TESTING AND ABATEMENT, INC.

WATERLOO, IOWA
319.287.4447

DAVENPORT, IOWA
563.323.2849

KANSAS CITY METRO AREA
816.892.2200

NOTES
- flooring
- Duct Paper Run to 2nd floor



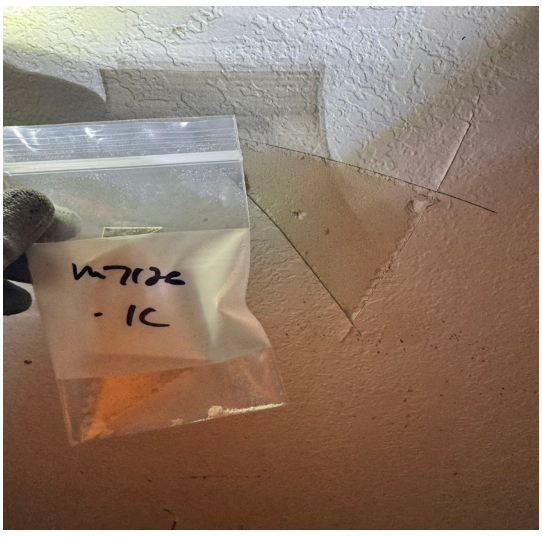
JOB#:	26-30948	NAME:	City of Waterloo: Mulberry St.



M7126-1A: Texture knockdown in room A first floor negative for asbestos.



M7126-1B: Texture knockdown 1st floor room D (kitchen) negative for asbestos.



M7126-1C: Texture knockdown in room B 1st floor negative for asbestos.



M7126-2A: Plaster ceiling in room B negative for asbestos.



M7126-2B: Plaster walls in room B negative for asbestos.



M7126-2C: Plaster walls in room B negative for asbestos.



M7126-3A: Ceramic tile/grout/mortar in bathroom 1st floor negative for asbestos.



M7126-4A: Floor tile in bathroom 1st floor two layers negative for asbestos.



M7126-5A: Floor tile, top layers in kitchen negative for asbestos.



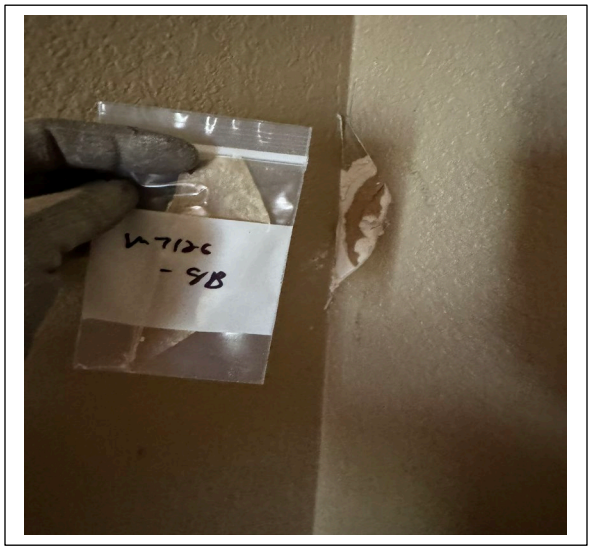
M7126-6A: Back splash ceramic tile/grout/mortar in kitchen negative for asbestos.



M7126-7A: Linoleum backer in hallway by basement landing next to kitchen positive for asbestos.



M7126-8A: Drywall/compound kitchen walls/ceiling negative for asbestos.



M7126-8B: Drywall/compound kitchen 1st floor negative for asbestos.



M7126-9A: Linoleum in kitchen bottom layer positive for asbestos.



M7126-10A: Tar paper under flooring in bathroom 1st floor negative for asbestos.



M7126-11A: Duct paper in basement, along with run to second floor positive for asbestos.



M7126-12A: Floor tile, top of landing 2nd floor negative for asbestos.



M7126-13A: Drywall/compound 1st bedroom to left 2nd floor, newer drywall negative for asbestos.



M7126-14A: Drywall/compound middle room 2nd floor walls negative for asbestos.



M7126-15A: Texture middle room 2nd floor walls negative for asbestos.



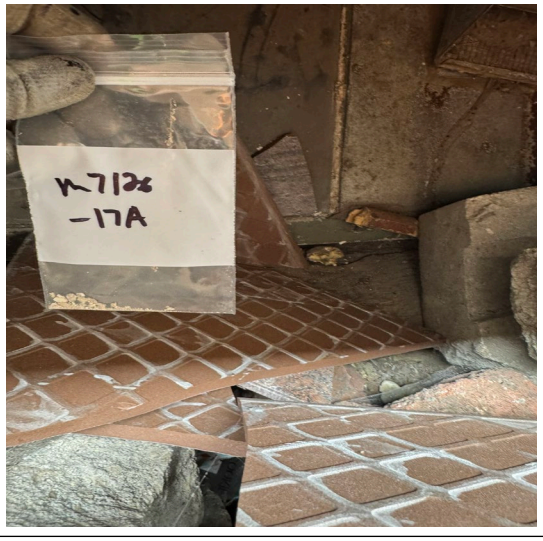
M7126-15B: Texture middle room 2nd floor walls negative for asbestos.



M7126-15C: Texture middle room 2nd floor walls negative for asbestos.



M7126-16A: Floor tile, 2nd floor front room negative for asbestos.



M7126-17A: Window glazing basement windows positive for asbestos.



M7126-18A: Tar on vent, top of roof negative for asbestos.



M7126-19A: Rolled roofing, top of house negative for asbestos.



M7126-20A: Shingle/tar paper on roof negative for asbestos.

ASBESTOS INSPECTION REPORT

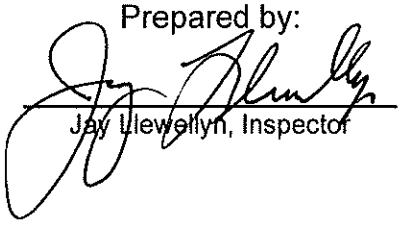
INSPECTION ADDRESS:
City of Waterloo
420 Bayard Street
Waterloo, IA 50703
Project #: 26-30449



SUBMITTED TO:
City of Waterloo Community Planning & Development
Attn: Aric Schroeder, City Planner
715 Mulberry Street
Waterloo, IA 50703

ASBESTOS INSPECTION

Prepared by:



Jay Llewellyn, Inspector

03/30/2026
Date

25-13314
Inspector #

04/09/2026
License Expiration date

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SECTION 1

INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspect Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (l) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packings, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials; i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspect asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility to these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces, and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms; i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspect ACM.
3. **Debris:** In areas where damaged ACM may be found there may and usually will

be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

6. **In the Inspection Report,** certain items such as mudded joints (MJ) or metal doors (MD), etc. are listed as units or number of units; i.e. 10 MJ, 3 Damaged, which is an indication of count rather than square feet or linear feet. Most materials listed in the assessment are either listed as square feet or linear feet with these noted exceptions.

7. **In the Assessment Process,** there are additional codes such as ME and MG; ME representing miscellaneous electrical and MG representing miscellaneous gasket materials. Both of these codes are used to indicate materials that are unusual to the normal course of an assessment of the building. Miscellaneous electrical materials include old electrical wiring, switchboards, transite panels, etc. Miscellaneous gasket materials can be found between (thermal) valves, on boiler doors, between fittings, between molds, etc. These codes give the Inspector the ability to qualify materials, which sometimes may not be considered as ACM.

8. **An Asbestos Code Sheet** is included with the Inspector's inspection report, which informs the client as to the Homogeneous Codes used during the inspection process.

9. **Caution-** Regarding Inspection results- Floor tiles, adhesives, and drywall (mud) found to not contain asbestos should be re-analyzed under the "Chatfield Method" of TEM analysis. Many times the results from having these materials analyzed under PLM results in false positives or false negatives. After reviewing your report, please notify the inspector if you want these samples analyzed under the "Chatfield Method".

10. Any sample less than 10% asbestos may be Point Counted. Point counting is a more accurate method of analyzing of bulk samples. The results of the point counting are the results that will determine if the material will be treated as asbestos.

11. Asbestos inspections are performed based on current understanding of the regulations. As new interpretations of the regulations are made aware of by the EPA, DNR, and Iowa Division of Labor. Advanced Environmental Testing and Abatement Inc. will adapt their inspections to comply with these new procedures. If additional sampling is required by the different agencies, Advanced Environmental will do the additional sampling. The owner is responsible for the additional cost for these samples as well as labor.

12. Advanced Environmental shall not be responsible for any cost of abating any additional asbestos discovered in any renovation or demolition activities. Any additional items discovered shall be tested when they become accessible. For example, old adhesive may be under new floor tiles and adhesive. Additional materials may be concealed in walls, under multi layers of flooring, etc.

13. All amounts listed are estimates. It is up to other contractors to field verify any amounts that are listed within this report.

14. All material that looks similar should be treated as asbestos containing materials.

15. Asbestos Material containing <1%. Some material tested for asbestos may contain trace amounts of asbestos and be below the threshold for asbestos contain material according to both the Iowa DNR and Iowa State Code.. However, the Federal Occupational Safety and Health Administration still have some regulations that contractors must follow under 29 CFR 1926.1101. Contractors working with asbestos material with <1% asbestos must still produce a negative and initial exposure assessment, completed by a "competent person". Contractors must follow 29 CFR 1926. 1101 (g)(1)(ii) and (iii) and 29 CFR 1926. 1101(g)(3)(i), (ii), and (iv). Please contact Advanced Environmental Testing and Abatement, Inc. for consultation on how to handle material with <1% asbestos.

16. Flat roofs: If any layer of a flat roof tests positive for asbestos, all layers should be considered asbestos and removed as such. Advanced Environmental makes every effort to core roof samples through all layers.

ASBESTOS CODES

A = Assumed
ADH = Adhesive
APW = Air Cell Pipe Wrap
BP = Boiler Plaster
C = Ceiling
CAPS = Stair Treads
CQ = Can't Quantify
CT = Ceiling Tiles
CT/12 = 12" Ceiling Tiles
DAM. = Damaged
DEB = Debris
DW = Drywall
F = Friable
FE = Furnace Exhaust
FT = Floor Tiles
GASK = Gaskets
GYM = Gypsum
HOMO = Homogeneous
LINO = Linoleum
MISC = Miscellaneous Non Friable
MAC = Metal Asbestos Chimney
MATL DESC = Material Description
MD = Metal Door
ME = Miscellaneous Electrical
MF = Miscellaneous Friable
MJ = Mudded Joint
NC = Nose Cap
NF = Non Friable
NSM = Not Suspect Material
P or PH = Previous History
PP = Patched Plaster/Drywall
PSA = Sand Plaster
PSM = Smooth Plaster
S = Sample/Samples/Sampled
SCT = Suspended Ceiling Tile
SR = Sample Result
ST = Storage Tank
SUR = Surfacing
T = Thermal
Thermal Pipe Measurement = Linear Ft
TR = Transite
TSI = Thermal System Insulation
VC = Vibration Cloth
VDW = Vinyl Covered Drywall
W = Walls
WD = Wood Door
N = North
S = South
E = East
W = West

1. All Metal Doors are listed by quantities, example 3 = 3 metal doors.
2. All Mudded Joints are listed by quantities of MJ, not sizes.
3. All Pipe Wrap materials are listed in linear feet.
4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
   Y = Considered Asbestos Containing Material
   P or PH = Previous History
   N/A = Not Analyzed
   <1% = Contains less than 1% Asbestos Containing Material
   >1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non Friable ACM.

SECTION 4

REPORT DATA

BUILDING NAME: Residence – 420 Bayard Street – Waterloo, IA
INSPECTION AREAS: Throughout
CLIENT CONTRACT: City of Waterloo – Aric Schroeder

METHOD:

All samples are sent to EMC LABS, INC in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology for Polarized Light Microscopy analysis under their NVLAP accreditation (NVLAP #: 101926-0). Sampling was completed by a State of Iowa licensed asbestos inspector. Sampling methods were based on National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos containing material were analyzed by Polarized Light Microscopy (PLM) using EPA Method 600-R93-116.

OVERVIEW:

An asbestos inspection was conducted at the residence located at 420 Bayard Street in Waterloo, IA on January14th of 2026. The house is full of debris throughout the house. We returned on March 26th to double check locations of acm. This is a 2-story building. The house was built in 1907. At the time of inspection, a total of thirteen samples were analyzed with twenty-three layers analyzed for asbestos content. Each sample is broken down by layers if necessary (I.e. floor tile and mastic). Samples can be categorized by miscellaneous, surfacing, and thermal. The following samples were taken of each:

Miscellaneous samples tested include:

Sheet floor & mastic
Linoleum & mastic
Window glazing
Drywall joint compound
12" x 12" floor tile & mastic
Roof shingles

Surfacing samples included:

Plaster /skim coat

Thermal samples include:

Duct paper
Attic & wall insulation
Refractory cement

SECTION 5

POSITIVE SAMPLE RESULTS:

The following samples tested positive (>1%) for asbestos:

1) Duct paper in basement & wall cavities	85% Chrysotile
8) Refractory cement in basement on Chimney stack	5% Chrysotile
12) Window glazing	3% Chrysotile

The inspection was to identify asbestos containing materials prior to demolition. The Inspection entailed a visual assessment of the property for suspect asbestos containing materials, collection, and submittal of bulk samples for analysis.

In the State of Iowa, asbestos is regulated by the Iowa Department of Natural Resources and the Iowa Division of Labor.

CONCLUSIONS AND RECOMMENDATIONS

There were four positive samples
:

1) The duct paper was located in at least four locations in the wall cavities and it is also in the basement in a couple of locations.. There is approximately 120 ln. ft. of this material.

2) The refractory cement in the basement on the chimney stack was positive (softer material). There is approximately 3 sq. ft. of this material.

3) There was one window laying on top of a pile of debris in the west room. Most of the windows have been removed during the fire. There may be a couple iof more.

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Facility Name/Site Location					
			Residence 420 Bayard Street Waterloo, IA 50701		**Inspected By:** Jay Llewellyn 1/14/2026
Sample No	**Material**	**Color**	**Location**	**Current Condition**	**Results**
1	**Duct paper**	**grey-white**	**In living room wall cavity - SE corner**	**damaged**	**85% Chrysotile**
2	Plaster	white	In living room - SE corner	damaged	0%
3	Sheet flooring	tan	Kitchen (under huge pile oif debris)	good	0%,0%,0%
4	Drywall joint compound	white	Kitchen - West side - South Wall	damaged	0%,0%
5	Plaster / skim coat	Grey / white	Kitchen - South wall	damaged	0%,0%,0%
6	Drywall joint compound	white	Kitchen - East side - South Wall	damaged	0%,0%
7	Linoluem	grey	Back entry - lots of debris on flooring +- 40 sq. ft.	good	0%,0%
8	**Refractory cement**	**white**	**Basement - Chimney - North side**	**some daamge**	**0%, 5% Chrysotile**
9	12" x 12" floor tile / mastic	greyish	2nd floor bathroom - under some debris)	some damage	0%,0%
10	Drywall joint compound	white	2nd floor bathroom - wall	damaged	0%,0%
11	Wall insulation	grey	West room (filled with debris)	some damage	0%
12	**Window glazing**	**white**	**West room - (laying on top of debris pile)**	**good**	**3% Chrysotile**
13	Roo fshingles	Green - gray	Roof	damaged	0%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0344505

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client: ADVANCED ENVIRONMENTAL
Address: 803 RICKER ST.
WATERLOO, IA 50703
Collected: 01/14/2026
Project Name: CITY OF WATERLOO HOUSES-420 BAYARD STREET-WATERLOO, IA
Address:

Job# / P.O. #: 26-30449A
Date Received: 01/15/2026
Date Analyzed: 01/19/2026
Date Reported: 01/19/2026
Submitted By: JAY LLEWELLYN
Collected By:

EPA Method: App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0344505-001 1	IN LIVING ROOM	Duct Paper, Gray/ White	Yes	Chrysotile	85%	Cellulose Fiber	5%
						Carbonates Gypsum Non-Fibrous Binder/Filler	10%
0344505-002 2	IN LIVING ROOM	Plaster, White	No	None Detected		Cellulose Fiber	<1%
						Gypsum Quartz Non-Fibrous Binder/Filler	99%
0344505-003 3	KITCHEN	LAYER 1 Sheet Flooring, Beige	No	None Detected		Cellulose Fiber	20%
						Carbonates Quartz Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Yellow	No	None Detected		Cellulose Fiber	3%
						Carbonates Quartz Non-Fibrous Binder/Filler	97%
		LAYER 3 Mastic, Black	No	None Detected		Cellulose Fiber	<1%
						Carbonates Quartz Non-Fibrous Binder/Filler	99%
0344505-004 4	KITCHEN	LAYER 1 Drywall, White/ Brown	No	None Detected		Cellulose Fiber	10%
						Gypsum Carbonates Non-Fibrous Binder/Filler	90%
		LAYER 2 Joint Compound, White/ Black	No	None Detected		Carbonates Perlite Non-Fibrous Binder/Filler	100%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0344505

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30449A
Address:	803 RICKER ST.	Date Received:	01/15/2026
	WATERLOO, IA 50703	Date Analyzed:	01/19/2026
Collected:	01/14/2026	Date Reported:	01/19/2026
Project Name:	CITY OF WATERLOO HOUSES-420 BAYARD STREET-WATERLOO, IA	Submitted By:	JAY LLEWELLYN
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0344505-005 5	KITCHEN	LAYER 1 Plaster-Scratch Coat, Gray/ Brown	No	None Detected	Quartz Gypsum Non-Fibrous Binder/Filler	100%
		LAYER 2 Plaster-Skim Coat, White	No	None Detected	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler	100%
		LAYER 3 Adhesive, Yellow	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	<1% 99%
0344505-006 6	KITCHEN	LAYER 1 Drywall, White/ Brown	No	None Detected	Cellulose Fiber Gypsum Carbonates Non-Fibrous Binder/Filler	10% 90%
		LAYER 2 Joint Compound, White/ Black	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	2% 98%
0344505-007 7	BACK ENTRY	LAYER 1 Linoleum, White	No	None Detected	Cellulose Fiber Fibrous Glass Foam Carbonates Non-Fibrous Binder/Filler	15% 5% 80%
		LAYER 2 Mastic, Yellow	No	None Detected	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	3% 97%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0344505

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30449A
Address:	803 RICKER ST.	Date Received:	01/15/2026
	WATERLOO, IA 50703	Date Analyzed:	01/19/2026
Collected:	01/14/2026	Date Reported:	01/19/2026
Project Name:	CITY OF WATERLOO HOUSES-420 BAYARD STREET-WATERLOO, IA	Submitted By:	JAY LLEWELLYN
		Collected By:	
Address:		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0344505-008 8	BASEMENT	LAYER 1 Refractory Cement, Dk. Gray	No	None Detected	Quartz Gypsum Non-Fibrous Binder/Filler 100%
		LAYER 2 Coating, White	Yes	Chrysotile 5%	Cellulose Fiber 2% Quartz Carbonates Gypsum Non-Fibrous Binder/Filler 93%
0344505-009 9	2ND FLOOR BATHROOM	LAYER 1 12"x12" Floor Tile, Gray	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
		LAYER 2 Mastic, Clear	No	None Detected	Cellulose Fiber 2% Synthetic Fiber <1% Carbonates Quartz Non-Fibrous Binder/Filler 97%
0344505-010 10	2ND FLOOR BATHROOM	LAYER 1 Joint Compound, White Note: No Drywall Present	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
		LAYER 2 Texture/ Paint, White	No	None Detected	Cellulose Fiber 1% Carbonates Quartz Non-Fibrous Binder/Filler 99%

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		Collected By:	
Address:		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0344505-011 11	WEST ROOM	Insulation, Brown	No	None Detected	Cellulose Fiber 98% Carbonates Non-Fibrous Binder/Filler 2%
0344505-012 12	WEST ROOM	Window Glazing, White/ Yellow	Yes	Chrysotile 3%	Carbonates Quartz Non-Fibrous Binder/Filler 97%
0344505-013 13	ROOF	Roof Shingle, Black	No	None Detected	Fibrous Glass 15% Carbonates Quartz Non-Fibrous Binder/Filler 85%

Analyst - Matt Kettler

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION

JAY LLEWELLYN

DOB: 05-31-1961

Issued: 12-23-2025



This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
INSPECTOR	25-13314	04-09-2026
SUPERVISOR	25-14152	12-17-2026

IOWA

Aaron Baack
Interim Director

Asbestos



Midwest Training Institute

"A Higher Standard of Training"

An ATC Company

This certifies that

Jay Llewellyn

has completed the requisite training for asbestos accreditation under TSCA Title II, 15 U.S.C. 2646 and the State of Nebraska Asbestos Regulations and passed the associated examination with a score of 70% or better.

EPA AHERA/Nebraska Asbestos Inspector Refresher Course

Course Location:
Omaha, NE

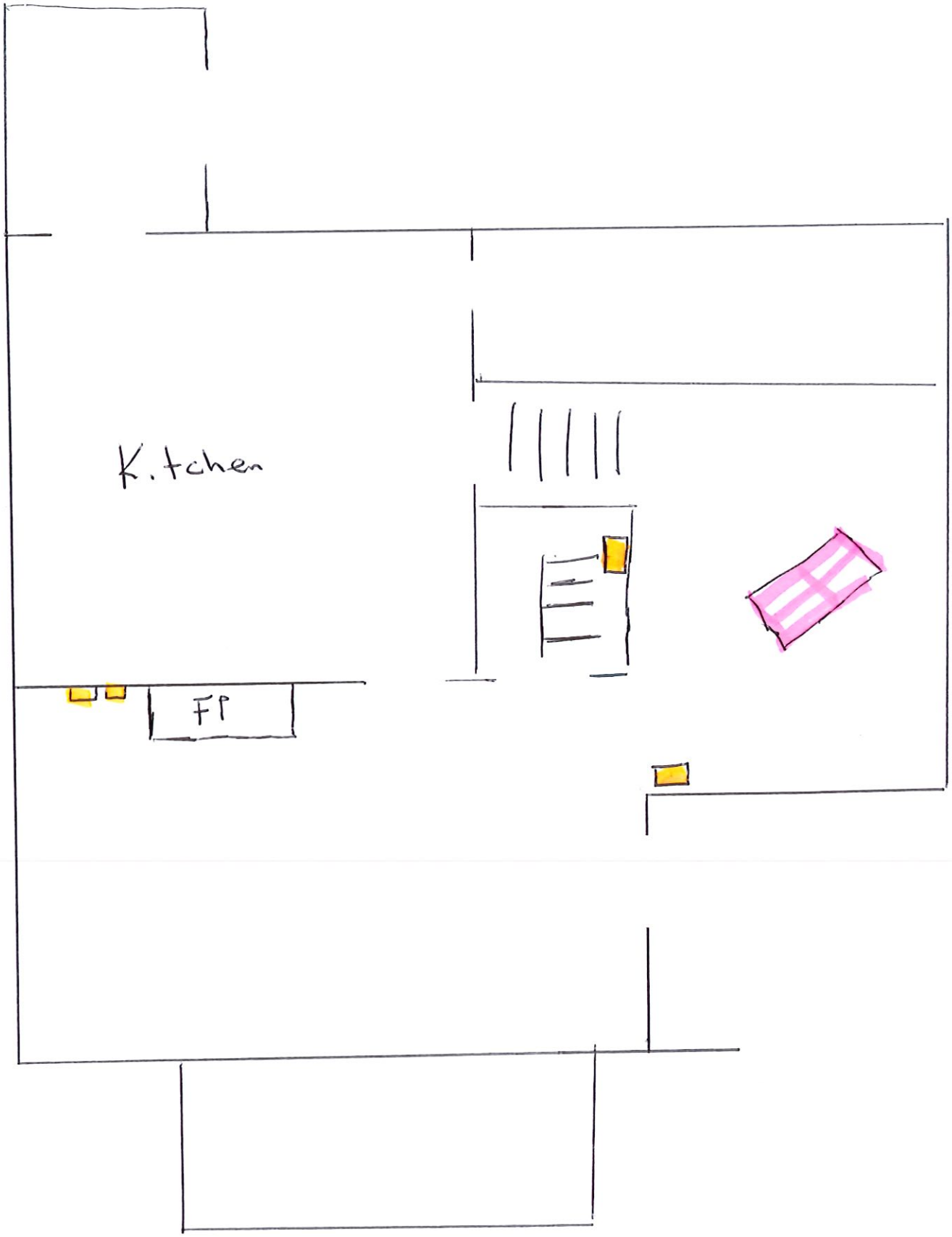
Midwest Training Institute, Inc.
11117 Mockingbird Drive
Omaha, NE 68137
(402) 697-9747
(402) 501-9206
www.atctraining-midwest.com

Tony L Wells

Instructor

Course Date: 04/09/2025
Examination Date: 04/09/2025
Expiration Date: 04/09/2026
Certificate # MTITC 0200 IR
Course Length 4 Hours

APPENDIX C
PICTURES



Front

420 Bayard St. - Waterloo, IA



Basement



420 Bayard Street – Waterloo, IA











House is full of debris





House is full of debris





Living room – South wall – East side

Duct paper (2 runs) – 85% Chrysotile





Basement – Duct paper – 85% Chrysotile





Basement – Duct paper – 85% Chrysotile





Burned out stairwell **West room – North wall**

Duct paper – 85% Chrysotile



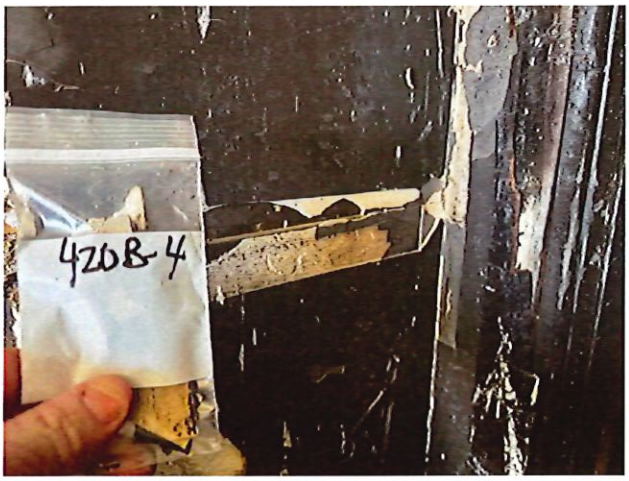


Living room – South wall – plaster / skim coat – NO ASBESTOS





Kitchen – Shet flooring (under debris) – NO ASBESTOS





Kitchen – Drywall joint compound – NO ASBESTOS



Kitchen – plaster – skim cot – NO ASBESTOS





Pantry area – Drywall joint compound – NO ASBESTOS





Back entry – sheet flooring/linoleum – NO ASBESTOS





Basement – chimney stack – Soft refractory cement – 5% Chrysotil

Sample #9 was floor tile & mastic from 2nd floor bathroom - NO ASBESTOS

Sample #10 was drywall joint compound from 2nd floor – NO ASBESTOS





Attic & wall insulation – NO ASBESTOS





Window in West room – main floor – Window glazing – 3% Chrysotile



Roof shingles – NO ASBESTOS

ASBESTOS INSPECTION REPORT

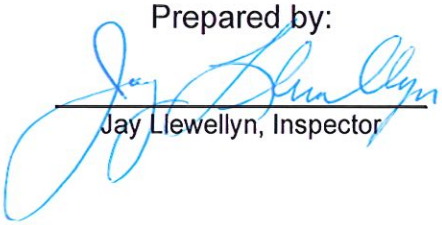
INSPECTION ADDRESS:
City of Waterloo
623 Barclay Street
Waterloo, IA 50703
Project #: 25-29918



SUBMITTED TO:
City of Waterloo Community Planning & Development
715 Mulberry Street
Waterloo, IA 50703
Attn: Aric Schroeder, City Planner

ASBESTOS INSPECTION

Prepared by:



Jay Llewellyn, Inspector

12/23/2026
Date

25-13314
Inspector #

04/09/2026
License Expiration date

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INTRODUCTION

For each area of the building, the inspector performing the inspection did the following:

1. Visually inspected the area(s) to identify the locations of all suspect Asbestos Containing Building Materials.

2. Identify all homogeneous areas of friable and non-friable suspected asbestos.

3. Assume, if necessary, that some or all of the homogeneous area(s) are Asbestos Containing Material (ACM), and for each homogeneous area that is not assumed to be ACM, collect and submit bulk samples for analysis.

SECTION 2

DEFINITIONS:

HOMOGENEOUS AREA
An area which appears similar throughout in terms of color, texture, and date of material application.

SURFACING MATERIAL
Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION
Means material applied to pipes, fittings, boilers breeching, tanks ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or other purposes.

MISCELLANEOUS MATERIAL
Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

SAMPLING AND ANALYSIS
All samples to be analyzed by Polarized Light Microscopy (PLM). Analysis was performed in accordance with EPA 40 CFR, Part 763, Appendix A to Subpart F.

A homogeneous area was considered not to contain Asbestos Containing Material (ACM) only if the results of all samples collected from the area showed asbestos in the amounts of one (I) percent (%) or less (_1%). A homogeneous area contains ACM when one or more samples collected from that area shows greater than one (1) percent (%) asbestos (>1%).

FRIABLE
Any material containing more than one (1) percent (%) asbestos that, when dry can be crumbled, pulverized, or reduced to a powder by hand pressure.

NON-FRIABLE (CATEGORY I)
Asbestos containing packings, gaskets, resilient floor covering, and asphalt roofing products, containing more than one (1) percent (%) asbestos.

NON-FRIABLE (CATEGORY II)
Any excluding Non-Friable (Category I) Asbestos Containing Material, containing more than one (1) percent (%) asbestos.

SECTION 3

General Building Inspection Observations

The building inspection is conducted by a qualified and State of Iowa licensed Asbestos Inspector. The purpose of a building inspection is to identify existing building materials that are asbestos containing materials (ACM). If the inspection is conducted in an occupied building, the Inspector is sometimes denied accessibility to building areas and materials; i.e., the Inspector may not be allowed to cut through floor coverings or walls, remove quarry tiles, etc. There are many situations where ACM are concealed in wall cavities and other non-accessible areas, such as tunnels, crawl spaces, above ceilings, pipe chases, behind wall coverings, beneath debris piles, under various floor coverings, etc. When these situations occur in construction, renovation, and/or demolition, etc., materials in these areas shall be treated as ACM and handled as such by qualified and licensed asbestos personnel. If suspect asbestos containing material is discovered or damaged during the course of any activities, the material shall be considered and treated as ACM to diminish further fiber release. In addition, the Inspector uses an independent laboratory that analyzes the bulk building material samples using Polarized Light Microscopy (PLM). PLM analysis technique may not be as accurate as more expensive analysis techniques for certain building materials. It remains the Building Owner and/or Representative(s)' responsibility to address this issue and consider analyzing suspect building material using different analysis techniques prior to disturbing the material(s). The following are areas that may not be inspected.

1. **Tunnels and Crawl Spaces:** During the inspection process, the Inspector attempts to check tunnels and crawl spaces for ACM and the degree of damage to the materials. In most cases, quantification of ACM in these areas is impossible due to the inaccessibility to these areas. In addition, these areas may fall under: "Confined Space Regulations". Due to the congestion in tunnels and crawl spaces, obtaining an accurate quantification for mudded joints, pipe wrap, etc. is almost impossible. The Inspector will quantify ACM only in accessible tunnels and crawl spaces, and estimate the quantities in the inaccessible areas. Some reasons for inaccessibility are as follows: flooded areas, pipe congestion, asbestos and other debris, electrical hazards, confined spaces, unknown gas emissions, low ceilings, etc.

2. **Boilers and Thermal System Insulation:** Interior portions of boilers, heaters, storage tanks, etc. are not always accessible. Materials in these areas will be treated as ACM. Areas of concern are packing inside boiler doors and liners. Use extreme care and properly trained personnel when handling these types of materials. Some boilers have insulated metal jackets over fiberglass or ACM. Thermal system insulation can be found in many different forms; i.e., air cell, preformed magnesium block, millboard, etc. All fiberglass materials are excluded as suspect ACM.
3. **Debris:** In areas where damaged ACM may be found there may and usually will

be ACM debris in the general area of the damaged material. These areas shall be treated with the utmost care even during the inspection and quantification process. The Inspector considers any exposure to this type of material as a health threat.

4. **State of Quantification:** As a general rule, individual rooms or areas of estimation contain inherently more probability of an error than those groups of rooms or areas or an entire building. In other words, the aggregate tends to be more accurate than the sums of the individual parts. Therefore, when designing response actions (measurements, air samples, etc.), the project designer and the asbestos abatement contractor's attention shall be given to ensure that quantification of materials and proper methods are followed through careful analysis of the site. If materials are quantified, the asbestos abatement contractor or owner, owner representatives or third parties are responsible for verifying the quantities.

5. **The Inspector** may take some latitude in the presentation of the Inspection Report. When the Inspector has found floor tiles, linoleum, and/or carpeting listed he/she may or may not have adhesives listed. Adhesives have been known to contain asbestos and therefore, although not mentioned, it may be presumed to be ACM, listed or not. Testing of the adhesive prior to disturbing is recommended. The same is true for adhesives or mastics used to adhere linoleum to floors or counter tops. All toweled-on and/or sprayed-on surfacing materials; i.e., floor mastics, wall and ceiling surfacing, etc. are either suspected or presumed ACM unless sampled and analyzed to indicate that they are not ACM.

6. **In the Inspection Report,** certain items such as mudded joints (MJ) or metal doors (MD), etc. are listed as units or number of units; i.e. 10 MJ, 3 Damaged, which is an indication of count rather than square feet or linear feet. Most materials listed in the assessment are either listed as square feet or linear feet with these noted exceptions.

7. **In the Assessment Process,** there are additional codes such as ME and MG; ME representing miscellaneous electrical and MG representing miscellaneous gasket materials. Both of these codes are used to indicate materials that are unusual to the normal course of an assessment of the building. Miscellaneous electrical materials include old electrical wiring, switchboards, transite panels, etc. Miscellaneous gasket materials can be found between (thermal) valves, on boiler doors, between fittings, between molds, etc. These codes give the Inspector the ability to qualify materials, which sometimes may not be considered as ACM.

8. **An Asbestos Code Sheet** is included with the Inspector's inspection report, which informs the client as to the Homogeneous Codes used during the inspection process.

9. **Caution-** Regarding Inspection results- Floor tiles, adhesives, and drywall (mud) found to not contain asbestos should be re-analyzed under the "Chatfield Method" of TEM analysis. Many times the results from having these materials analyzed under PLM results in false positives or false negatives. After reviewing your report, please notify the inspector if you want these samples analyzed under the "Chatfield Method".

10. Any sample less than 10% asbestos may be Point Counted. Point counting is a more accurate method of analyzing of bulk samples. The results of the point counting are the results that will determine if the material will be treated as asbestos.

11. Asbestos inspections are performed based on current understanding of the regulations. As new interpretations of the regulations are made aware of by the EPA, DNR, and Iowa Division of Labor. Advanced Environmental Testing and Abatement Inc. will adapt their inspections to comply with these new procedures. If additional sampling is required by the different agencies, Advanced Environmental will do the additional sampling. The owner is responsible for the additional cost for these samples as well as labor.

12. Advanced Environmental shall not be responsible for any cost of abating any additional asbestos discovered in any renovation or demolition activities. Any additional items discovered shall be tested when they become accessible. For example, old adhesive may be under new floor tiles and adhesive. Additional materials may be concealed in walls, under multi layers of flooring, etc.

13. All amounts listed are estimates. It is up to other contractors to field verify any amounts that are listed within this report.

14. All material that looks similar should be treated as asbestos containing materials.

15. Asbestos Material containing <1%. Some material tested for asbestos may contain trace amounts of asbestos and be below the threshold for asbestos contain material according to both the Iowa DNR and Iowa State Code.. However, the Federal Occupational Safety and Health Administration still have some regulations that contractors must follow under 29 CFR 1926.1101. Contractors working with asbestos material with <1% asbestos must still produce a negative and initial exposure assessment, completed by a "competent person". Contractors must follow 29 CFR 1926. 1101 (g)(1)(ii) and (iii) and 29 CFR 1926. 1101(g)(3)(i), (ii), and (iv). Please contact Advanced Environmental Testing and Abatement, Inc. for consultation on how to handle material with <1% asbestos.

16. Flat roofs: If any layer of a flat roof tests positive for asbestos, all layers should be considered asbestos and removed as such. Advanced Environmental makes every effort to core roof samples through all layers.

ASBESTOS CODES

A = Assumed
ADH = Adhesive
APW = Air Cell Pipe Wrap
BP = Boiler Plaster
C = Ceiling
CAPS = Stair Treads
CQ = Can't Quantify
CT = Ceiling Tiles
CT/12 = 12" Ceiling Tiles
DAM. = Damaged
DEB = Debris
DW = Drywall
F = Friable
FE = Furnace Exhaust
FT = Floor Tiles
GASK = Gaskets
GYM = Gypsum
HOMO = Homogeneous
LINO = Linoleum
MISC = Miscellaneous Non Friable
MAC = Metal Asbestos Chimney
MATL DESC = Material Description
MD = Metal Door
ME = Miscellaneous Electrical
MF = Miscellaneous Friable
MJ = Mudded Joint
NC = Nose Cap
NF = Non Friable
NSM = Not Suspect Material
P or PH = Previous History
PP = Patched Plaster/Drywall
PSA = Sand Plaster
PSM = Smooth Plaster
S = Sample/Samples/Sampled
SCT = Suspended Ceiling Tile
SR = Sample Result
ST = Storage Tank
SUR = Surfacing
T = Thermal
Thermal Pipe Measurement = Linear Ft
TR = Transite
TSI = Thermal System Insulation
VC = Vibration Cloth
VDW = Vinyl Covered Drywall
W = Walls
WD = Wood Door
N = North
S = South
E = East
W = West

1. All Metal Doors are listed by quantities, example 3 = 3 metal doors.
2. All Mudded Joints are listed by quantities of MJ, not sizes.
3. All Pipe Wrap materials are listed in linear feet.
4. All other measurements are square feet unless stated elsewhere.
5. Sample Results: N = Not Considered Asbestos Containing Material
   Y = Considered Asbestos Containing Material
   P or PH = Previous History
   N/A = Not Analyzed
   <1% = Contains less than 1% Asbestos Containing Material
   >1% = Contains more than 1% Asbestos Containing Material
6. All Adhesives are considered Asbestos Containing Material (ACM) which can't be quantified - Non Friable ACM.
7. All Seals and Gaskets are considered Asbestos Containing Material (ACM) which can't be quantified – Non Friable ACM.

SECTION 4

REPORT DATA

BUILDING NAME: Residence – 623 Barclay Street – Waterloo, IA
INSPECTION AREAS: Throughout
CLIENT CONTRACT: City of Waterloo – Aric Schroeder

METHOD:

All samples are sent to EMC LABS, INC in Phoenix, Arizona. EMC LABS is accredited by the National Institute for Standards and Technology for Polarized Light Microscopy analysis under their NVLAP accreditation (NVLAP #: 101926-0). Sampling was completed by a State of Iowa licensed asbestos inspector. Sampling methods were based on National Emission Standards for Hazardous Air Pollutants (NESHAPS) protocols. Bulk samples of suspect asbestos containing material were analyzed by Polarized Light Microscopy (PLM) using EPA Method 600-R93-116.

OVERVIEW:

An asbestos inspection was conducted at the residence located at 623 Barclay Street in Waterloo, IA on January13th & 14th of 2026.. This is a 2 story building. The house was built in 1897. At the time of inspection, a total of twenty-seven samples were analyzed with forty-eight layers analyzed for asbestos content. Each sample is broken down by layers if necessary (I.e. floor tile and mastic). Samples can be categorized by miscellaneous, surfacing, and thermal. The following samples were taken of each:

Miscellaneous samples tested include:

Linoleum & mastic
Sheet flooring & mastic
Window glazing
12" x 12" floor tile & mastic
Roof shingles on felt paper
Drywall joint compound
2' x 4' ceiling tile
Wall board adhesive
Roof tar at base of roof vents

Surfacing samples included:

Plaster /skim coat
Texture on plaster

Thermal samples include:

Duct paper

POSITIVE SAMPLE RESULTS:

The following samples tested positive (>1%) for asbestos:

3) Sheet flooring in SW room under carpeting on main level	17% Chrysotile
3) mastic for above	3% Chrysotile
9) Duct paper in basement – 3 locations	60% Chrysotile
15) 12" x 12" floor tile on 2nd floor – NE bedroom under carpet	3% Chrysotile
22) Sheet flooring on 2nd floor in hallway	20% Chrysotile
22) mastic for above	3% Chrysotile
26) Roof tar at base of roof vents	7% Chrysotile

The inspection was to identify asbestos containing materials prior to demolition. The Inspection entailed a visual assessment of the property for suspect asbestos containing materials, collection, and submittal of bulk samples for analysis.

In the State of Iowa, asbestos is regulated by the Iowa Department of Natural Resources and the Iowa Division of Labor.

CONCLUSIONS AND RECOMMENDATIONS

There were five positive samples
:

1) Sheet flooring on the main level – SW room under carpeting. The mastic under this flooring was positive as well There is approximately 140 sq. ft..

2) The duct paper was positive. There were 3 locations in the basement that were identified. The runs to the 2nd floor were not in wall cavities and did NOT have any duct paper on them. (See pictures). There is approximately 16 sq. ft.

3) 12" x 12" floor tile was found on the 2nd floor in the NE bedroom. This was underneath carpeting as well. There is approximately 140 sq. ft.

4) Sheet flooring on the 2nd floor in the hallway between the three bedrooms and bathroom. This flooring was also under carpeting. The mastic under this flooring was positive as well There is approximately 100 sq. ft..

5) Roof tar at the base of the roof vents. There is one vent in NW corner of roof. Need to check upper section of roof. Approximately 2 sq. ft. of roof tar

APPENDIX A
SAMPLE INVENTORY LIST, LAB ANALYSIS

Facility Name/Site Location					
			Residence 623 Barclay Street Waterloo, IA 50703		**Inspected By:** Jay Llewellyn 1/13/2026 & 1/14/2026
Sample No	**Material**	**Color**	**Location**	**Current Condition**	**Results**
B-1	Linoleum / mastic	beige-brown / Tan	Kitchen – NW room	good	0%,0%
B-2	Drywall jont compound	white	Kitchen ceiling - West	damaged	0%
B-3	**Sheet flooring/mastic**	**stone pattern / tan**	**SW room (under carpeting)**	**good**	**17%,3% Chrysotile**
B-4	2'x 4' ceiling tile	white	SE room (143 sq. ft.)	some damage	0%
B-5	Window glazing	grey-white	SE room – old windows / glazing	good	0%
B-6	Plaster	grey	SE room - North wall	some damage	0%
B-7	Drywall jont compound	white	Kitchen ceiling - East	Some damage	0%
B-8	Wall board adhesive	brown	Kitchen - East wall	some daamge	0%
B-9	**Duct paper**	**grey**	**Basement (3 locations)**	**good**	**60% Chrysotile**
B-10	Plaster	grey	Basement stairwell ceiling	damaged	0%
B-11	Sheet flooring	white sq. pattern	SE room (under 3 layers of carpet) / top layer of floor	good	0%
B-12	Sheet flooring	floral pattern	SE room (under 4 layers of flooring) / bottom two layers	good	0%,0%,0%,0%
B-13	Sheet flooring	white / floral	Main entry hallway - under carpeting	good	0%,0%,0%,0%
B-14	Sheet flooring	pink - silver	Front porch (under carpeting	good	0%,0%
B-15	**12" x 12" floor tile/mastic**	**stone pattren/yellow**	**2nd floor - NE bedroom under carpeting -**	**good**	**3% Chrysotile,0%**
B-15A	Plaster w / texture	grey / white	2nd floor - SE bedroom - ceiling - Center	some damage	0%,0%
B-16	two layers of sheet flooring	brown / greeen	2nd floor - SE bedroom (under carpeting)	good	0%,0%
B-17	Plaster w / texture	grey / white	2nd floor - SE bedroom - ceiling - North	some damage	0%,0%,0%
B-18	Plaster w / texture	grey / white	2nd floor - SE bedroom - North wall	some damage	0%,0%,0%
B-19	Sheet flooring	grey	2nd floor - SE bedroom closet	good	0%
B-20	Drywall jont compound	white	2nd floor - SW bedroom ceiling	some damage	0%
B-21	Drywall jont compound	white	2nd floor - SW bedroom - wall - NW corner	some damage	0%
B-22	**Sheet flooring / mastic**	**Stone pattern / light yellow**	**2nd floor - hallway (under carpeting)**	**good**	**20%,3% Chrysotile**
B-23	Linoleum	white - blue diamond	2nd floor bathroom	good	0%,0%
B-24	Drywall jont compound	white / white	2nd floor bathroom ceiling	some damage	0%
B-25	Sheet flooring	tan / white	Main entrry closet under stairs - two layers	good	0%,0%
B-26	**Roof tar**	**black**	**At base oif roof vent**	**good**	**7% Chrysotile**
B-27	Roof shingles on felt paper	green - white / black	Roof	good	0%,0%

EMC LABS, INC.

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Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0344453

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30449
Address:	803 RICKER ST.	Date Received:	01/14/2026
	WATERLOO, IA 50703	Date Analyzed:	01/16/2026
Collected:	01/12/2026	Date Reported:	01/16/2026
Project Name:	CITY OF WATERLOO HOUSES-623 N. BARCLAY-WATERLOO, IA	Submitted By:	JAY LLEWELLYN
		Collected By:	
Address:		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0344453-001 B-1	KITCHEN-NW ROOM	LAYER 1 Linoleum, Beige/ Brown	No	None Detected		Cellulose Fiber	17%
						Fibrous Glass	3%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Beige/ Tan	No	None Detected		Cellulose Fiber	1%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	99%
0344453-002 B-2	KITCHEN	Drywall Joint Compound/ Paint, Gray/ Off White	No	None Detected		Carbonates	
						Perlite	
						Non-Fibrous Binder/Filler	100%
0344453-003 B-3	SW ROOM	LAYER 1 Sheet Flooring, Beige/ Lt. Gray Note: Stone Pattern	Yes	Chrysotile	17%	Cellulose Fiber	3%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Beige/ Tan	Yes	Chrysotile	3%	Cellulose Fiber	1%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	96%
0344453-004 B-4	SE ROOM	2'x4' Ceiling Tile, White/ Beige	No	None Detected		Cellulose Fiber	40%
						Mineral Wool	40%
						Fibrous Glass	3%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	17%

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Laboratory Report
0344453

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		Collected By:	
Address:		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0344453-005 B-5	SE ROOM	Glazing, Off White/ Gray	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
0344453-006 B-6	SE ROOM	Plaster, Beige/ Lt. Gray	No	None Detected		Gypsum Quartz Non-Fibrous Binder/Filler	100%
0344453-007 B-7	KITCHEN	Drywall Joint Compound/ Paint, Gray/ Off White	No	None Detected		Carbonates Perlite Non-Fibrous Binder/Filler	100%
0344453-008 B-8	KITCHEN	Wallboard Adhesive, Dk. Brown	No	None Detected		Carbonates Quartz Non-Fibrous Binder/Filler	100%
0344453-009 B-9	BASEMENT (3 LOCATIONS)	Duct Paper, Beige/ Gray	Yes	Chrysotile	60%	Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	30% 10%
0344453-010 B-10	BASEMENT STAIRWELL	Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected		Gypsum Quartz Non-Fibrous Binder/Filler	100%

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Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0344453-011 B-11	SE ROOM	Linoleum, Beige/ Tan/ Black	No	None Detected	Cellulose Fiber 18% Synthetic Fiber 2% Carbonates Quartz Non-Fibrous Binder/Filler 80%
0344453-012 B-12	SE ROOM	LAYER 1 Linoleum, Beige/ Tan/ Black	No	None Detected	Cellulose Fiber 18% Synthetic Fiber 2% Carbonates Quartz Non-Fibrous Binder/Filler 80%
		LAYER 2 Mastic, Tan	No	None Detected	Cellulose Fiber 2% Synthetic Fiber 1% Carbonates Quartz Non-Fibrous Binder/Filler 97%
		LAYER 3 Linoleum, Beige/ Tan/ Black	No	None Detected	Cellulose Fiber 18% Synthetic Fiber 2% Carbonates Quartz Non-Fibrous Binder/Filler 80%
		LAYER 4 Mastic, Red	No	None Detected	Cellulose Fiber 2% Synthetic Fiber 1% Carbonates Quartz Non-Fibrous Binder/Filler 97%

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Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	(%)
0344453-013 B-13	FRONT ENTRY WAY	LAYER 1 Linoleum, Beige/ Black	No	None Detected		Cellulose Fiber Synthetic Fiber Carbonates Quartz Non-Fibrous Binder/Filler	18% 2% 80%
		LAYER 2 Mastic, Green	No	None Detected		Cellulose Fiber Carbonates Quartz Non-Fibrous Binder/Filler	1% 99%
		LAYER 3 Linoleum, Beige/ Tan/ Black	No	None Detected		Cellulose Fiber Synthetic Fiber Carbonates Quartz Non-Fibrous Binder/Filler	18% 2% 80%
		LAYER 4 Mastic, Red	No	None Detected		Cellulose Fiber Synthetic Fiber Carbonates Quartz Non-Fibrous Binder/Filler	2% 1% 97%

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	WATERLOO, IA 50703	Date Analyzed:	01/16/2026
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Project Name:	CITY OF WATERLOO HOUSES-623 N. BARCLAY-WATERLOO, IA	Submitted By:	JAY LLEWELLYN
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents

Analyst - Ramon Suarez

Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. This report is for the exclusive use of the addressed client and will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of sixty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method(s) for asbestos. The Client/Customer supplies the following information for this report: The Project Name, Address, Collection Date/Time, Sample Collector, Job/PO Number, Client Sample Identification and Sample Location. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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Laboratory Report
0344514

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client:	ADVANCED ENVIRONMENTAL	Job# / P.O. #:	26-30449
Address:	803 RICKER ST.	Date Received:	01/15/2026
	WATERLOO, IA 50703	Date Analyzed:	01/19/2026
Collected:	01/14/2026	Date Reported:	01/19/2026
Project Name:	CITY OF WATERLOO HOUSES-623 BARCLAY STREET-WATERLOO, IA	Submitted By:	JAY LLEWELLYN
Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0344514-001 B-14	FRONT PORCH	LAYER 1 Sheet Flooring Backing, Pink/ Silver/ Black	No	None Detected		Cellulose Fiber	40%
						Synthetic Fiber	10%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	50%
		LAYER 2 Mastic, Pink/ Silver	No	None Detected		Cellulose Fiber	1%
						Synthetic Fiber	<1%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	98%
0344514-002 B-15	2ND FLOOR-NE BEDROOM	LAYER 1 12"x12" Floor Tile, Beige/ Off White	Yes	Chrysotile	3%		
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	97%
		LAYER 2 Mastic, Yellow	No	None Detected		Cellulose Fiber	5%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	95%
0344514-003 B-15A	2ND FLOOR-SE BEDROOM	LAYER 1 Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected		Hair	1%
						Quartz	
						Gypsum	
						Non-Fibrous Binder/Filler	99%
		LAYER 2 Texture/ Paint, Beige/ White	No	None Detected			
						Carbonates	
						Gypsum	
						Quartz	
						Non-Fibrous Binder/Filler	100%

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Address:		Collected By:	
		EPA Method:	App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0344514-004 B-16	2ND FLOOR-SE BEDROOM	LAYER 1 Sheet Flooring, Beige/ Black/ Brown Note: No Mastic Present	No	None Detected	Cellulose Fiber 20% Synthetic Fiber 5% Carbonates Quartz Non-Fibrous Binder/Filler 75%
		LAYER 2 Sheet Flooring, Beige/ Black/ Green Note: No Mastic Present	No	None Detected	Cellulose Fiber 17% Synthetic Fiber 3% Carbonates Quartz Non-Fibrous Binder/Filler 80%
0344514-005 B-17	2ND FLOOR-SE BEDROOM	LAYER 1 Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected	Cellulose Fiber <1% Quartz Gypsum Non-Fibrous Binder/Filler 100%
		LAYER 2 Plaster-Finish Coat, White	No	None Detected	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler 100%
		LAYER 3 Texture/ Paint, Beige/ Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%

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Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP# 101926-0

Client: ADVANCED ENVIRONMENTAL
Address: 803 RICKER ST.
WATERLOO, IA 50703
Collected: 01/14/2026
Project Name: CITY OF WATERLOO HOUSES-623 BARCLAY STREET-WATERLOO, IA
Address:

Job# / P.O. #: 26-30449
Date Received: 01/15/2026
Date Analyzed: 01/19/2026
Date Reported: 01/19/2026
Submitted By: JAY LLEWELLYN
Collected By:

EPA Method: App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0344514-006 B-18	2ND FLOOR-SE BEDROOM	LAYER 1 Plaster-Scratch Coat, Beige/ Lt. Gray	No	None Detected	Hair <1% Quartz Gypsum Non-Fibrous Binder/Filler 100%
		LAYER 2 Plaster-Finish Coat, White	No	None Detected	Gypsum Carbonates Quartz Non-Fibrous Binder/Filler 100%
		LAYER 3 Texture/ Paint, Lt Purple/ Off White	No	None Detected	Carbonates Quartz Non-Fibrous Binder/Filler 100%
0344514-007 B-19	2ND FLOOR-SE BEDROOM CLOSET	Sheet Flooring, Beige/ Black/ Brown Note: No Mastic Present	No	None Detected	Cellulose Fiber 20% Synthetic Fiber 5% Carbonates Quartz Non-Fibrous Binder/Filler 75%
0344514-008 B-20	2ND FLOOR-SW BEDROOM	Drywall Joint Compound, Beige/ Off White	No	None Detected	Carbonates Perlite Non-Fibrous Binder/Filler 100%
0344514-009 B-21	2ND FLOOR-SW BEDROOM	Drywall Joint Compound, Beige/ Off White	No	None Detected	Carbonates Perlite Non-Fibrous Binder/Filler 100%

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Submitted By: JAY LLEWELLYN
Collected By:

EPA Method: App.E to Sub.E of 40 CFR Part 763 and EPA/600/R-93/116

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0344514-010 B-22	2ND FLOOR-HALLWAY	LAYER 1 Sheet Flooring, Beige/ Lt. Gray Note: Stone Pattern	Yes	Chrysotile	20%	Cellulose Fiber	5%
						Carbonates	
						Gypsum	
						Non-Fibrous Binder/Filler	75%
		LAYER 2 Mastic, Lt. Yellow Note: Difficult to separate adjacent layer	Yes	Chrysotile	3%	Cellulose Fiber	2%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	95%
0344514-011 B-23	2ND FLOOR BATHROOM	LAYER 1 Linoleum, Beige/ Lt. Gray/ Blue Diamond	No	None Detected		Cellulose Fiber	10%
						Fibrous Glass	5%
						Synthetic Fiber	5%
						Foam	
						Carbonates	
						Non-Fibrous Binder/Filler	80%
		LAYER 2 Mastic, Lt. Yellow	No	None Detected		Cellulose Fiber	3%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	97%
0344514-012 B-24	2ND FLOOR BATHROOM	Drywall Joint Compound, Beige/ Off White	No	None Detected			
						Carbonates	
						Perlite	
						Non-Fibrous Binder/Filler	100%

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Address:		Collected By:	
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Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0344514-013 B-25	MAIN ENTRY CLOSET	LAYER 1 Sheet Flooring, Beige/ Black/ Green Note: No Mastic Present	No	None Detected		Cellulose Fiber	20%
						Synthetic Fiber	5%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	75%
		LAYER 2 Sheet Flooring, Off White/ Black/ Green Note: No Mastic Present	No	None Detected		Cellulose Fiber	20%
						Synthetic Fiber	5%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	75%
0344514-014 B-26	ROOF	Roofing Tar/ Mastic, Gray/ Black	Yes	Chrysotile	7%		
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	93%
0344514-015 B-27	ROOF	LAYER 1 Roof Shingle, Green/ Off White/ Black	No	None Detected		Cellulose Fiber	20%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	80%
		LAYER 2 Roof Felt, Black	No	None Detected		Fibrous Glass	35%
						Carbonates	
						Quartz	
						Non-Fibrous Binder/Filler	65%

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Analyst - Matt Kettler

Signatory - Lab Director - Kurt Kettler

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APPENDIX B
INSPECTOR LICENSE AND CERTIFICATION

JAY LLEWELLYN

DOB: 05-31-1961

Issued: 04-18-2025



This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
INSPECTOR	25-13314	04-09-2026
SUPERVISOR	24-12596	11-14-2025

IOWA

Asbestos

Larry Johnson, Jr.
Labor Commissioner

Midwest Training Institute

"A Higher Standard of Training"

An ATC Company

This certifies that

Jay Llewellyn

has completed the requisite training for asbestos accreditation under TSCA Title II, 15 U.S.C. 2646 and the State of Nebraska Asbestos Regulations and passed the associated examination with a score of 70% or better.

EPA AHERA/Nebraska Asbestos Inspector Refresher Course

Course Location:
Omaha, NE

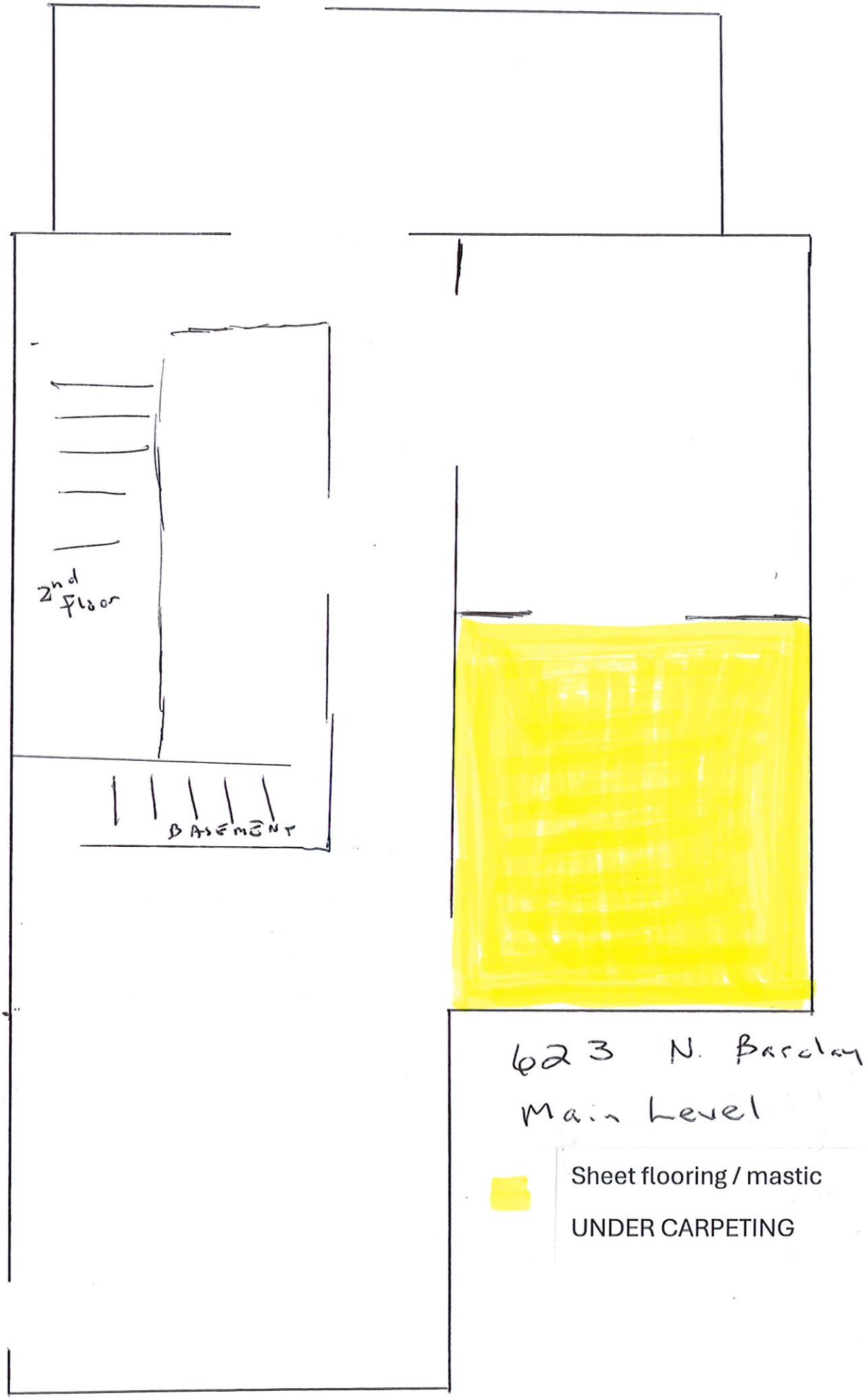
Midwest Training Institute, Inc.
11117 Mockingbird Drive
Omaha, NE 68137
(402) 697-9747
(402) 501-9206
www.atctraining-midwest.com

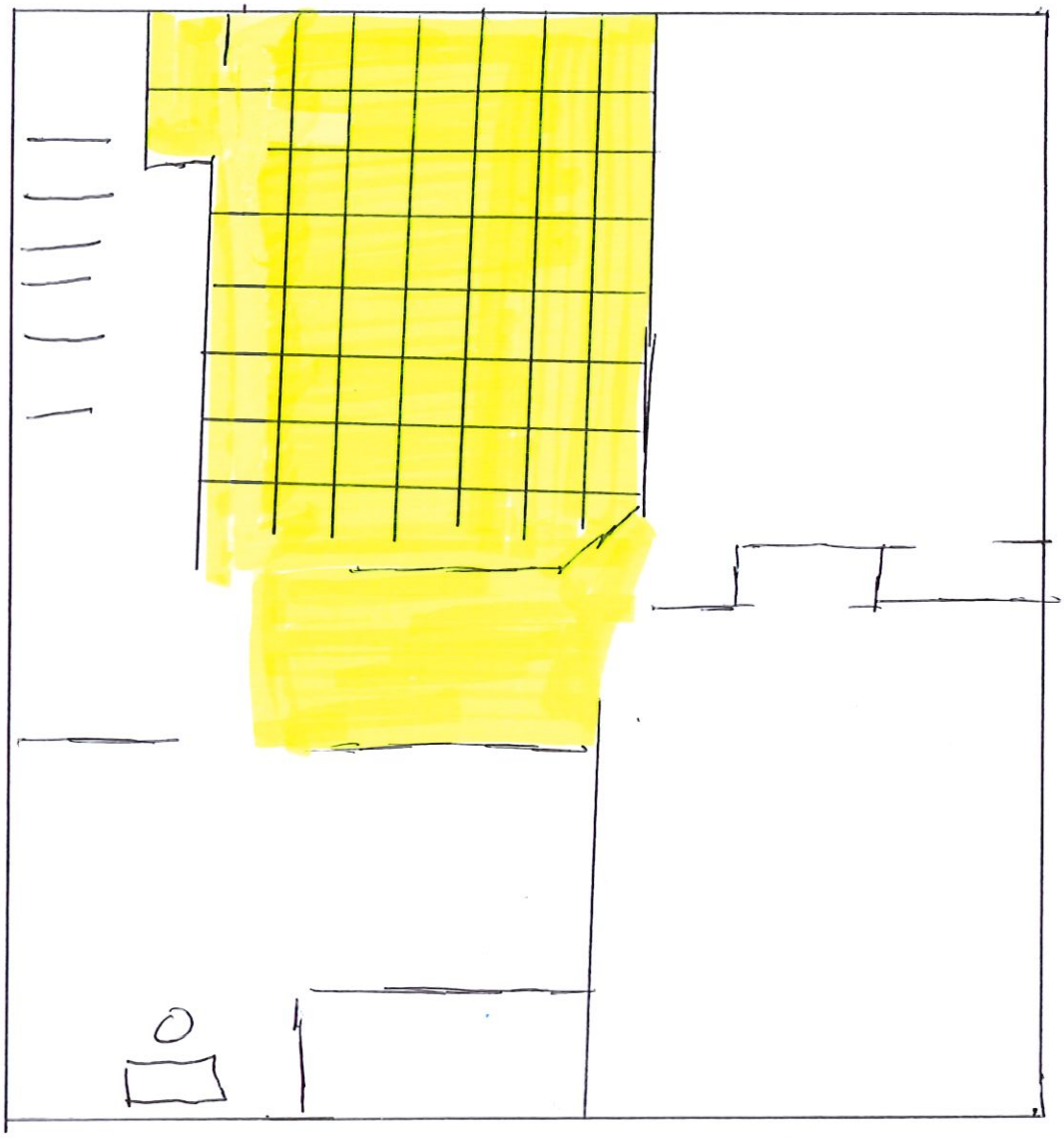
Tony L Wells

Instructor

Course Date: 04/09/2025
Examination Date: 04/09/2025
Expiration Date: 04/09/2026
Certificate # MTITC 0200 IR
Course Length 4 Hours

APPENDIX C
PICTURES


2nd floor
BASEMENT
623 N. Barclay
Main Level
Sheet flooring / mastic
UNDER CARPETING

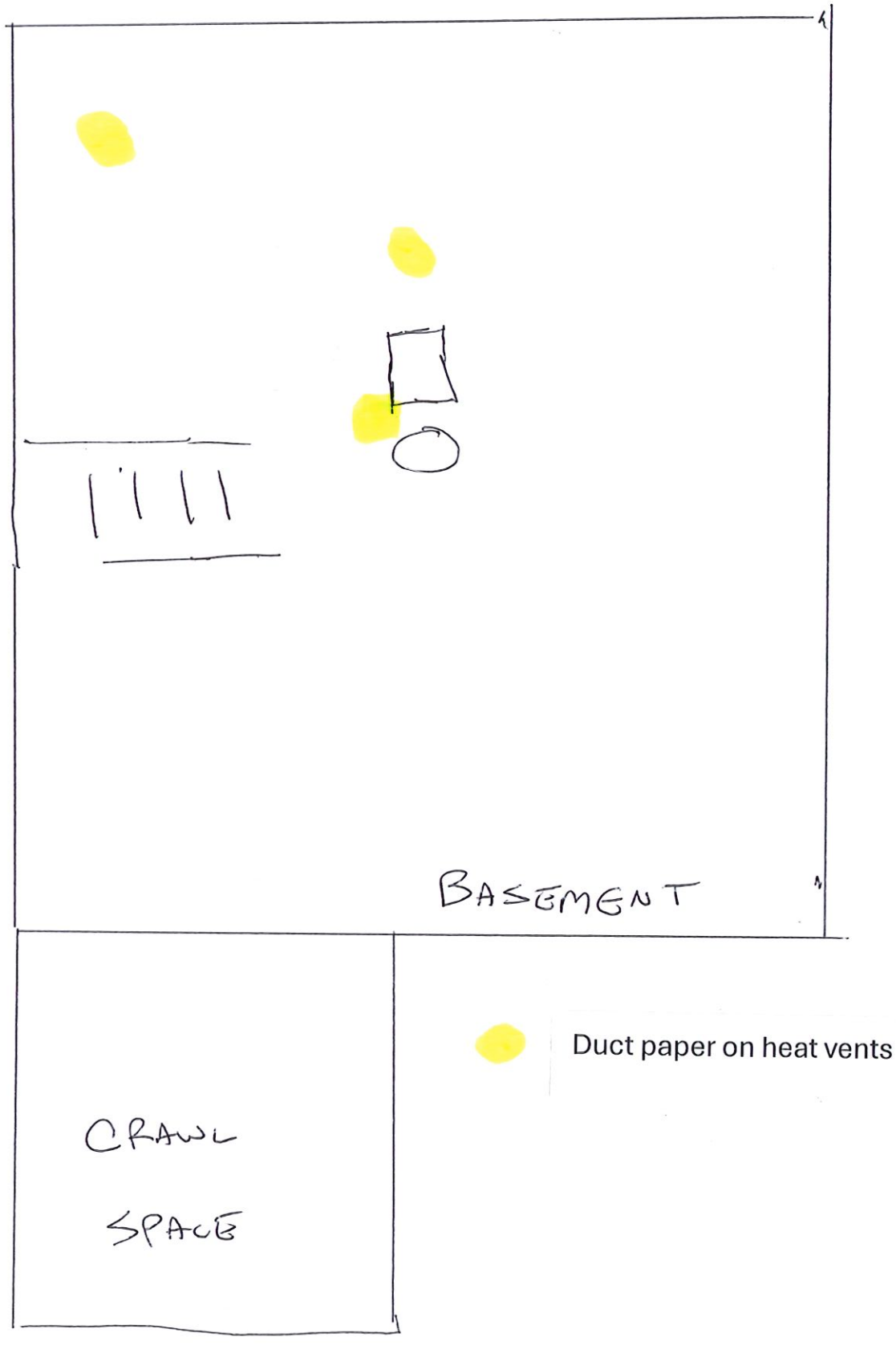


12" x 12" floor tile

UNDER CARPETING

Sheet flooring / mastic

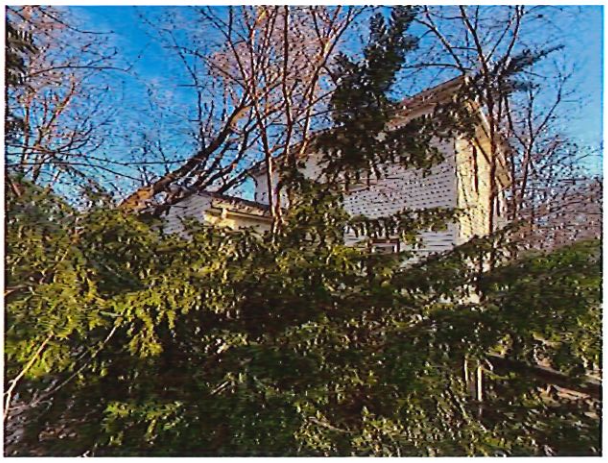
UNDER CARPETING

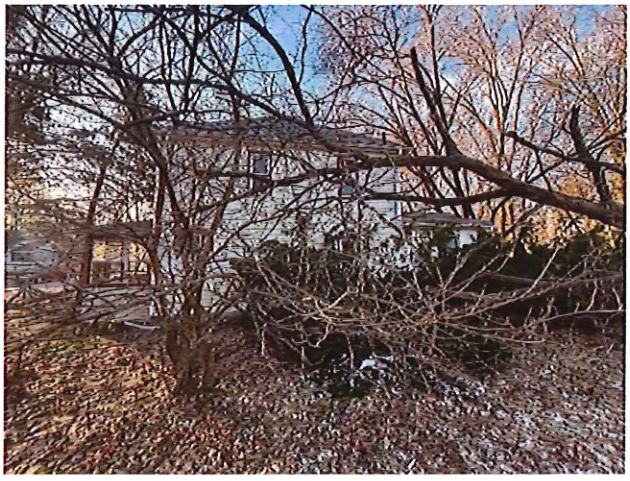

BASEMENT
CRAWL
SPACE
Duct paper on heat vents

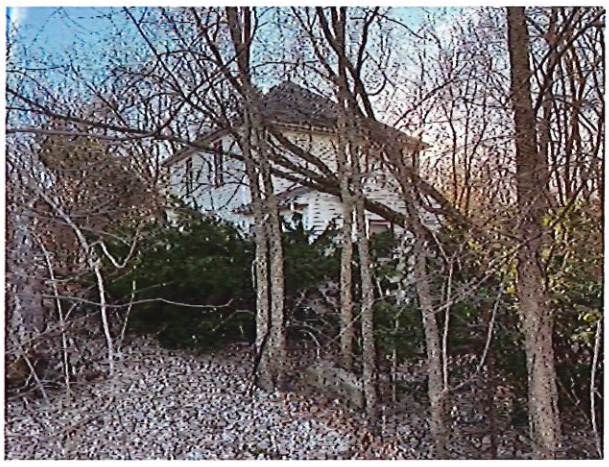


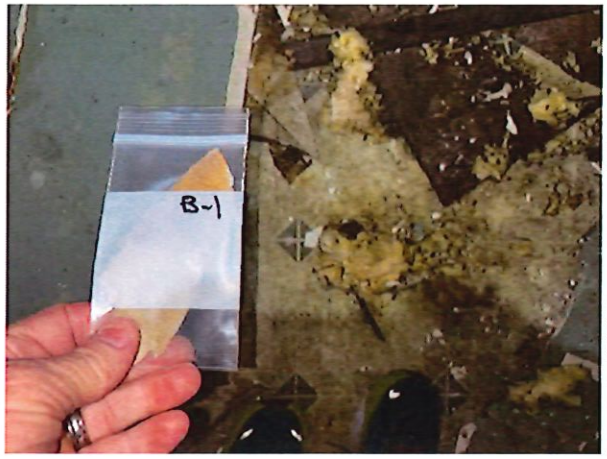
City of Waterloo House – 623 Barclay St.













Kitchen – Sheet flooring – NO ASBESTOS





Kitchen ceiling – Drywall joint compound – NO ASBETSOS





SW room (under carpeting)

Sheet flooring – 17% Chrysotile – Mastic – 3% Chrysotile



Ceiling tile were fiberglass in SW room



NO adhesive for paneling





SE Room – 2’ x 4’ ceiling tile – NO ASBESTOS





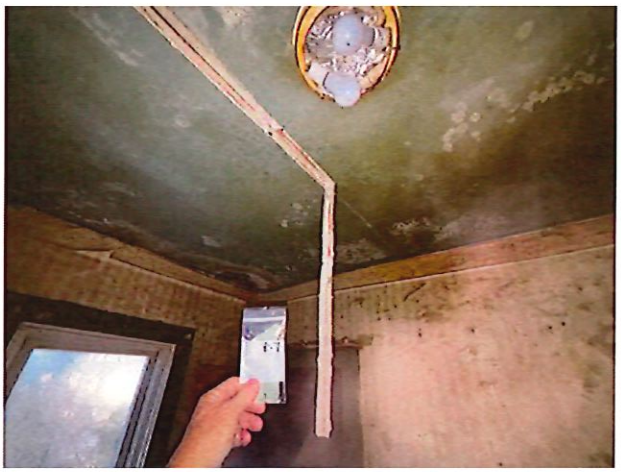
SE room – South window -Window glazing – NO ASBESTOS





SE room – North wall (behind paneling) – Plaster – NO ASBESTOS





Kitchen ceiling – drywall joint compound – NO ASBESTOS



Kitchen -Wallboard adhesive – NO ASBESTOS



Basement – Duct paper – 60% Chrysotile

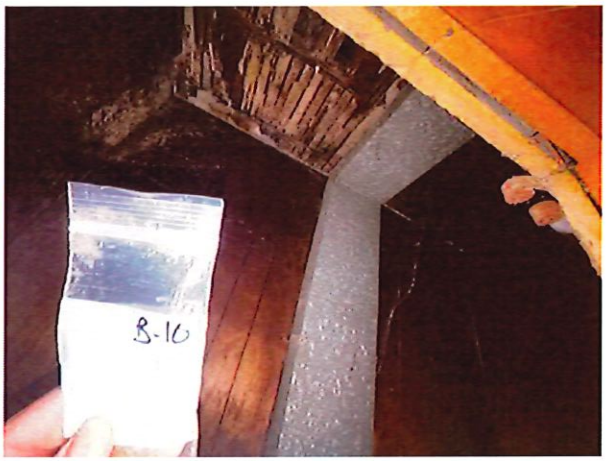


Basement – Duct paper – 60% Chrysotile



Basement – Crawl Space – did not see anything -Had fiberglass insulation





Basement Stairwell Ceiling – Plaster – NO ASBESTOS





2nd floor SE Bedroom – Under carpet – three layers of flooring – NO ASBESTOS



Font Entry (under carpeting) / 2 layers of sheet flooring/mastic-NO ASBESTOS



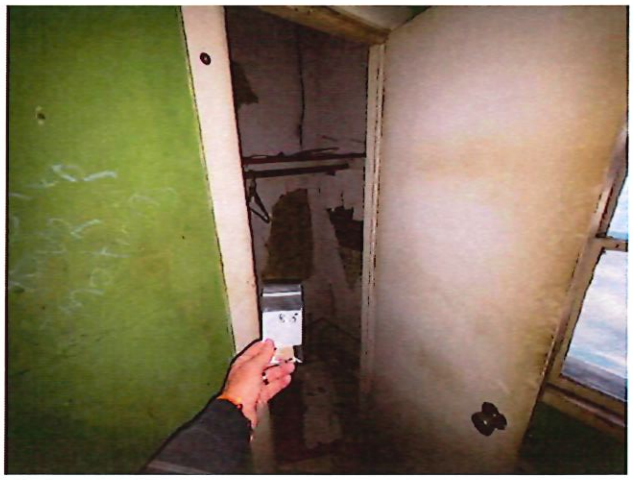
Front Porch – Sheet flooring – NO ASBESTOS



2nd floor – NE Bedroom – (under carpeting)

Sheet flooring – 3% Chrysotile Mastic – NO ASBESTOS



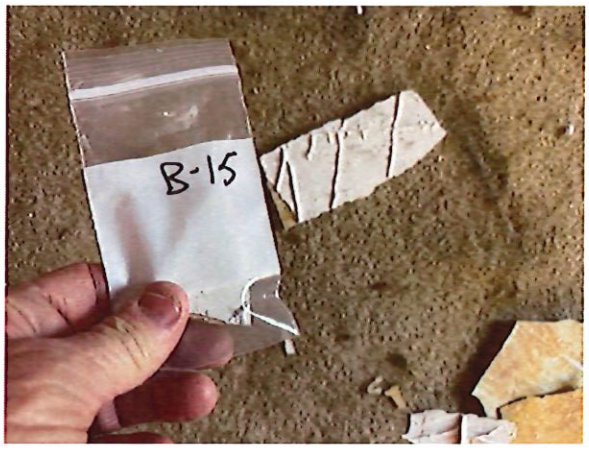


2nd floor – SE bedroom – Plaster / skim coat – NO ASBESTOS





2nd floor – SE bedroom (under carpeting)– Sheet flooring – NO ASBESTOS





2nd floor – SE bedroom ceiling – Plaster w/texture – NO ASBESTOS



2nd floor – SE bedroom ceiling – Plaster w/texture – NO ASBESTOS





2nd floor – SE bedroom walls – Plaster w/texture – NO ASBESTOS





2nd floor – SE Bedroom Closet – Sheet flooring– NO ASBESTOS





2nd floor-SW bedroom ceiling–drywall joint compound-NO ASBESTOS





2nd floor-SW bedroom walls-drywall joint compound-NO ASBESTOS





2nd floor Hall – under carpeting

Sheet flooring - 20% Chrysotile – Mastic – 3% Chrysotile




2nd floor bathroom - Sheet flooring – NO ASBESTOS

Light shield was fiberglass



Attic – NO INSULATION




2nd floor bathroom ceiling – drywall joint compound – NO ASBESTOS





Main front entry closet – Sheet flooring (2 layers)– NO ASBESTOS





Ducts not insulated to 2nd floor



NW area of roof - Roof tar at base of roof vent – 7% Chrysotile



Roof – Roof shingles on felt paper – NO ASBESTOS

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Jamie Knutson, City Engineer
Engineering Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
FY 2027 Sidewalk Repair Assessment Program - Zone 5B, Contract No. 1156.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION
The extent of the work involved is removing and replacing PCC sidewalk of various widths and thicknesses and water valve repair within Zone 5B of the City of Waterloo's Sidewalk Repair Program.
This project is generally located in an area bound by:
E. Ridgeway Avenue – East City Limit Line – South City Limit Line – Kimball Avenue

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES
Property Owner Assessments

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Bid Tabulation FY 2027 Sidewalk Repair Assessment Program - Zone 5B, Contract No. 1156

FY 2027 Sidewalk Repair Assessment Program - Zone 5B, Contract No. 1156

Engineer's Estimate: $107,576.10

Bid Opening: September 3, 2026

Bidder	Bid Security	Bid Amount
BROCK EVEN CONSTRUCTION, LLC JESUP, IOWA	5%	$104,440.83
BOULDER CONTRACTING, GRUNDY CENTER	5%	$131,434.50
N.B. KOCH GENERAL CONTRACTORS, CEDAR FALLS, IOWA	5%	$183,358.96

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Jamie Knutson, City Engineer
Engineering Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

FY 2027 Sergeant Road Trail Repairs, Contract No. 1091.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

This project is being bid by the Iowa Department of Transportation (IDOT) and the City is required to complete a public hearing on the proposed improvements. IDOT bid is September 15, 2026.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

None

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
City Council Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Resolution establishing a temporary moratorium on approvals relating to data centers.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
1. Data Center Moratorium (1)

RESOLUTION NO. 26-

RESOLUTION ESTABLISHING A TEMPORARY MORATORIUM ON APPROVALS RELATING TO DATA CENTERS

WHEREAS, Data Centers involve and infrastructure and land use considerations that warrant further study, including, but not limited to, water consumption, electrical demand, stormwater management, wastewater management, noise, emergency response, public safety, transportation impacts, utility capacity, environmental impacts, building design, site security, compatibility with surrounding land uses, and the potential need for additional development standards or conditions;

WHEREAS, the City Council desires to provide City staff, the Planning and Zoning Commission, and other appropriate boards, commissions, consultants, agencies, and utility providers sufficient time to study these matters and recommend any amendments to the City's Comprehensive Plan, Zoning Ordinance, development regulations, or other policies deemed appropriate;

WHEREAS, the City Council has identified a need to review the City's Comprehensive Plan, Zoning Ordinance, subdivision regulations, building and development standards, and other applicable City policies and ordinances as they relate to the development and operation of Data Centers;

WHEREAS, the City Council further desires to preserve the status quo while this review is underway and prevent the approval of applications that could be inconsistent with amendments or regulations developed as a result of that review;

WHEREAS, the City Council finds the following temporary regulations to be in the best interests of the City and the general public.

NOW THEREFORE BE IT RESOLVED;

Section 1. Definitions.

For purposes of this Resolution, the following definitions shall apply:

"Data Center" means a building rehabilitated or constructed to house a group of networked server computers in one physical location in order to centralize the storage, management, and dissemination of data and information pertaining to a particular business, taxonomy, or body of knowledge, containing uninterrupted power supply systems, specialized cooling systems designed for high-density computing loads, and/or contain cybersecurity systems designed for secure digital infrastructure operations. A data center business's facility typically includes the communications connections, environmental controls, and fire suppression systems. A data center business's facility also includes a restricted access area employing advanced physical

security measures such as video surveillance systems and card-based security or biometric security access systems.

The term "Data Center" shall not include a facility that is primarily used for manufacturing, research (including but not limited to quantum computing research or biomedical research), or education at an accredited educational institution by the State of Iowa, or provision of medical care.

"Approval" shall include, but not be limited to, any permit, application, zoning amendment, rezoning request, site plan, development plan, subdivision approval, special-use permit, variance, building permit, grading permit, utility-extension approval, certificate of occupancy, or other City authorization related to the establishment, construction, expansion, or operation of a Data Center.

"Substantial Expansion" shall mean any expansion, modification, redevelopment, or conversion that increases the operational capacity, physical footprint, utility demand, or primary function of a facility for Data Center purposes.

Section 2. Temporary Moratorium Established.

A temporary moratorium is hereby established on the acceptance, processing, and issuance of permits, applications, and other Development Approvals for the establishment, construction, Substantial Expansion, or operation of Data Centers within the corporate limits of the City of Waterloo.

During the effective period of this Resolution, no City department shall accept, process, approve, or issue any Development Approval for a Data Center unless specifically authorized pursuant to this Resolution.

Section 3. Applicability.

This Resolution shall apply to:

1. New Data Centers proposed within the City of Waterloo; and

2. The Substantial Expansion, redevelopment, or conversion of existing structures or uses for Data Center purposes.

This Resolution shall not prevent ordinary repair, maintenance, or replacement work necessary to protect public health, safety, or welfare at a lawfully existing facility, provided such work does not constitute the establishment, expansion, or conversion of a facility into a Data Center.

Section 4. Pending Applications.

This moratorium shall apply to applications that have not received final City approval as of the effective date of this Resolution, except to the extent the City Attorney determines that an applicant has acquired vested rights under applicable law.

Section 5. Effective Date and Duration.

The provisions of this Resolution shall take effect upon passage and shall remain in full force and effect for a period of three (3) months from the date of passage.

The City Council may extend the effective date and duration by resolutions as needed for further study. In no case shall this moratorium exceed one year.

Any extension authorized pursuant to this Section shall identify the extended expiration date of the moratorium and shall not be construed as authorizing an indefinite continuation of the moratorium without further legislative action by the City Council.

Section 6. Severability Clause.

If any section, provision, or part of this Resolution shall be adjudged to be invalid or unconstitutional, such adjudication shall not affect the validity of the Resolution as a whole, or any section thereof, not adjudged invalid or unconstitutional.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Todd Derifield, Leisure Services Director
Leisure Services Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution approving the Amendment to Business Property Lease with Friends of Faith Retirement Homes, Inc. for the purpose of stormwater detention, pickle ball courts, and parking at Bontrager Park, and authorizing Mayor and City Clerk to execute said document.

RECOMMENDED COUNCIL ACTION

Approval

SUMMARY STATEMENT AND BACKGROUND INFORMATION

A property lease with Friends of Faith Retirement Homes, Inc. was approved by City Council on 8/2/21. The purpose of this original agreement was to allow stormwater detention, parking, and pickleball courts at Bontrager Park. The amendment on the agenda is due to a change in design. The original agreement included a 100 stall parking lot and the amendment includes a 23 stall hard surface parking lot in Bontrager Park. Friends of Faith Retirement Homes, Inc. plan to build a 95 stall parking lot on their property instead of the large parking lot described in the original agreement. Also, wording has been added to define pickle ball court use more clearly for tenants of Friends of Faith Retirement Homes, Inc. and the general public.

NEIGHBORHOOD IMPACT

The Neighborhood will be gaining recreational opportunities that have been in high demand in the last several years.

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

The improvements described in the agreement will be at no cost to the City of Waterloo.

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Amendment to Bontrager Park Lease - signed by Friendship Village
2. Bontrager Park Lease Agreement 2021- Signed
3. FV revised Pickle Ball and parking lots

AMENDMENT TO BUSINESS PROPERTY LEASE

This Amendment to Business Property Lease ("Amendment") is made and entered into as of _____, 2026, by and between the City of Waterloo, Iowa, an Iowa municipal corporation ("Landlord"), and Friends of Faith Retirement Homes, Inc., an Iowa nonprofit corporation ("Tenant").

RECITALS

A. Pursuant to the provisions of that certain Business Property Lease dated August 3, 2021 (the "Lease") between Landlord and Tenant, Tenant leases from Landlord the real property located at the western portion of Bontrager Park in Waterloo, Iowa, as set forth on Exhibit "A" attached to the Lease (the "Premises").

B. The Lease contains a provision, Section 21, that relates to, inter alia, Tenant's construction of a parking lot and pickleball courts on the Premises (the "Project").

C. Tenant has requested, and Landlord consents to, amendment of the terms contained in Section 21 related to the Project, and the parties desire to enter into this Amendment for the purpose of amending the terms contained in Section 21 of the Lease, all as more particularly set forth herein.

D. All references to the Lease shall mean the Lease, as amended, whether or not such reference shall expressly refer to such amendment. Unless otherwise provided herein, all capitalized words and terms used herein shall have the same meanings ascribed to such words and terms as in the Lease.

AGREEMENT

NOW THEREFORE, for and in consideration of the mutual covenants and agreements set forth in this Amendment, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Landlord and Tenant hereby agree as follows:

1. Recitals. The above recitals are true and correct and are incorporated into this Amendment.

2. Amendment to Section 21. Section 21 of the Lease is deleted and replaced by Section 21 attached hereto as Exhibit A.

3. No Other Modifications. Except as otherwise expressly provided in this Amendment, all provisions of the Lease remain in full force and effect and are not modified by this Amendment, and the parties hereby ratify and confirm each and every provision thereof.

4. Entire Agreement. This Amendment contains the entire agreement of the parties and all preliminary negotiations are merged into and incorporated in this Amendment, and all prior documents and correspondence between the parties are superseded and of no further force and effect other than the Lease.

5. Severability. If any provision of this Amendment is held invalid, unenforceable or void, the remainder of this Amendment shall not be affected thereby and shall continue in full force and effect. In the event of a conflict or inconsistency between the provisions of this Amendment and the provisions of the Lease, the provisions of this Amendment shall govern and control to the extent of any such conflict or inconsistency.

[*Signature pages follow*.]

IN WITNESS WHEREOF, Landlord and Tenant have executed this Amendment to Business Property Lease as of the date first above written.

LANDLORD:

City of Waterloo, Iowa

By: _____
David Boesen, Mayor

Attest: _____
Kelley Felchle, City Clerk

STATE OF IOWA)
) ss.
BLACK HAWK COUNTY)

On _____, 2026, before me, the undersigned, a Notary Public in and for the State of Iowa, personally appeared David Boesen and Kelley Felchle, to me personally known, and who, being by me duly sworn, did say that they are the Mayor and City Clerk, respectively, of the City of Waterloo, Iowa; that the seal affixed to the foregoing instrument is the corporate seal of the corporation, and that the instrument was signed and sealed on behalf of the corporation by authority of its City Council as contained in the Resolution adopted by the City Council, under Council Action No. _____ of the City Council on _____, 2026, and that David Boesen and Kelley Felchle acknowledged the execution of the instrument to be their voluntary act and deed and the voluntary act and deed of the corporation, by it voluntarily executed.

_____
Notary Public

TENANT:

Friends of Faith Retirement Homes, Inc.

By: Sherry Turner
Sherry Turner, its President/CEO

SALLY A ADAMS
COMMISSION NO. 799640
MY COMMISSION EXPIRES
10-4-2028

STATE OF IOWA)
) ss.
BLACK HAWK COUNTY)

Acknowledged before me on August 17, 2026 by Sherry Turner as President/CEO of Friends of Faith Retirement Homes, Inc.

Sally A Adams
Notary Public

Exhibit "A"

21. OTHER PROVISIONS. (a) Either party may record this Lease or a memorandum hereof at any time.

(b) Tenant shall, at its own cost and expense, undertake all work of site preparation and construction necessary to excavate a stormwater detention facility and construct a paved, approximately 23-stall parking lot and up to three pickleball courts on the premises, together with such lighting, fencing, landscaping and other improvements as Tenant may desire, subject to the provisions of this paragraph. Tenant shall submit specific designs and site plans for review and approval by the Waterloo Leisure Services Director and City Engineer before the commencement of construction. The initial site plan is attached hereto as Exhibit "B" for purposes of illustration but may be modified upon mutual consent of the parties. Tenant will use its best efforts to obtain, or cause to be obtained, in a timely manner, all required permits, licenses and approvals, and will meet, in a timely manner, all requirements of all applicable local, state, and federal laws and regulations which must be obtained or met before the Improvements may be lawfully constructed. All improvements shall be constructed in accordance with all applicable building codes and shall comply with all applicable city ordinances and other applicable law. Any future replacements or alterations to the improved premises shall be subject to Tenant's compliance with the provisions of this paragraph that are applicable to original construction.

(c) The parking lot to be constructed by Tenant shall avoid an existing paved area of eleven (11) parking spaces on the northwest side of the premises. Pursuant to prior agreement between Landlord and the owner of the abutting property (currently DEC Real Estate LC), the abutting owner has the right to use such spaces for its business purposes. Tenant agrees not to interfere with such right of use or direct access thereto from the abutting owner's property.

(d) [*Intentionally deleted*.]

(e) Tenant shall be solely responsible for all repair, maintenance and upkeep of the premises and improvements thereon, including but not limited to snow removal, mowing, and weed control. As an alternative to remedies under Section 16, Landlord may, if Tenant fails to repair and maintain the improvements, terminate this Lease if Tenant does not provide to Landlord, within thirty (30) days after delivery of written notice to Tenant, a plan to complete repairs and/or maintenance according to plans and on a time table reasonably acceptable to Landlord. Tenant shall be further responsible for litter control in and around the premises, including but not limited to areas within 50 feet of the premises on any street, sidewalk, or other publicly owned area. Litter shall be picked up no less than weekly, but shall be done as often as required to maintain the premises and surrounding areas in clean condition. Tenant shall be solely responsible for any utility costs relating to the premises.

(f) The parking lot, pickleball courts, and other Tenant improvements shall be available for use by the general public at all times during normal operating hours, except: (i) Tenant's residents, guests and staff will have priority on two of the three pickleball courts between 9:00 AM and noon each day; and (ii) Tenant may reserve the facilities for up to four daily special events per year. Tenant's proposed closure of the facilities for special events, whether in whole or in part or whether in accordance with a regular schedule or otherwise, shall be subject to advance approval by the Waterloo Leisure Services Director or successor, which shall not be unreasonably withheld. Tenant may post reasonable regulations regarding use of the premises. Tenant shall provide, at its own cost and expense, any security that Tenant considers necessary or advisable for the protection of Tenant's residents, their guests, and any of their vehicles.

(g) Unless otherwise agreed, any improvements made by Tenant during the Lease term shall become the sole property of Landlord at the expiration of this Lease, without compensation for same to Tenant.

BUSINESS PROPERTY LEASE

This Business Property Lease (the "Lease") is made and entered into as of August 3, 2021, by and between the City of Waterloo, Iowa, an Iowa municipal corporation ("Landlord"), whose address for the purpose of this Lease is 715 Mulberry Street, Waterloo, Iowa, 50703, and Friends of Faith Retirement Homes, Inc., an Iowa nonprofit corporation ("Tenant"), whose address for the purposes of this Lease is 600 Park Lane, Waterloo, Iowa 50702.

1. PREMISES AND TERM. The Landlord, in consideration of the rents herein reserved and of the agreements and conditions herein contained, on the part of the Tenant to be kept and performed, leases unto the Tenant, and Tenant hereby rents and leases from Landlord, according to the terms and provisions herein, the following described real estate, situated in Black Hawk County, Iowa, to wit:

a portion of western Bontrager Park, as set forth on Exhibit "A" attached hereto;

with the improvements thereon and all rights, easements, and appurtenances thereto belonging, for a term commencing upon the date hereof and continuing until and including December 31, 2096, upon the condition that the Tenant pays rent therefor, and otherwise performs as provided in this Lease.

2. RENTAL. Tenant agrees to pay to Landlord as rental for said term, as follows: $10.00, in advance, due upon signing of this Lease.

3. POSSESSION. Tenant shall be entitled to possession on the first day of the term of this Lease and shall yield possession to the Landlord at the time and date of the close of this Lease term, except as herein otherwise expressly provided.

4. USE OF PREMISES. Tenant covenants and agrees during the term of this Lease to use and to occupy the leased premises only for pickleball courts, parking, stormwater detention and management facilities, and such other lawful purposes to which Landlord may give its advance written consent at any time during the term hereof.

5. QUIET ENJOYMENT. Landlord covenants that its estate in said premises is fee simple and that the Tenant on paying the rent herein reserved and performing all the agreements by the Tenant to be performed as provided in this Lease, shall and may peaceably have, hold and enjoy the demised premises for the term of this Lease free from molestation, eviction or disturbance by the Landlord or any other persons or legal entity whatsoever, except as otherwise provided herein.

6. CARE AND MAINTENANCE OF PREMISES. Tenant takes the leased premises in their present condition. Landlord shall have no duty whatsoever to care for or maintain the premises or any part thereof, or to prepare the premises in any way for Tenant's use. Tenant will make no unlawful use of said premises and agrees to comply with all valid regulations of the Board of Health, municipal ordinances, and the laws and regulations of the State of Iowa and the federal government, but this provision shall not be construed as creating any duty by Tenant to members of the general public. Tenant will not allow trash of any kind to accumulate on the premises, and it will remove same from the premises at its own expense. Tenant shall, after taking possession of the premises and until the termination of this Lease and the actual removal from the premises, at its own expense, care for and maintain the premises, including but not limited to any Tenant improvements, in a reasonably safe and serviceable condition consistent with its own needs and pursuant to applicable law, ordinance or regulation. Tenant shall make no structural improvements without the Landlord's prior written approval of the plans and specifications therefor. Tenant shall be responsible for all necessary upkeep of lawns and grounds to keep the premises well-maintained. Tenant shall be responsible to clear ice and snow from all sidewalks on or abutting the premises. Also see Section 21.

7. FACILITY SERVICES. Tenant, during the term of this Lease, shall pay before delinquency all charges for use of water, sewer, gas, electricity, power, garbage or trash disposal, and all other utilities or services of whatever kind and nature which may be used in or upon the leased premises.

8. END OF TERM. (a) This Lease shall terminate upon expiration of the original term in accordance with Section 1. Tenant agrees that upon the termination of this Lease it will surrender, yield up and deliver the leased premises as required by Sections 3 and 4. Tenant shall not continue to occupy the premises beyond the Lease term without the express prior written consent of Landlord.

(b) TERMINATION FOR CAUSE. At any time during the term of this Lease or any renewal thereof, Landlord may terminate this Lease for cause by delivery of written notice of termination to Tenant no less than ninety (90) days before such termination. For purposes of this Lease, "cause" shall mean any material breach of the terms or conditions of this Lease by Tenant, including but not limited to a failure to provide any documentation required to be delivered to Landlord hereunder. Said notice shall specify the grounds constituting cause for termination. Following delivery of such notice, Tenant shall have a period of thirty (30) days in which to cure the default to the reasonable satisfaction of Landlord, and following such cure Landlord shall deliver to Tenant a written notice of revocation of notice of termination.

9. ASSIGNMENT AND SUBLETTING. Tenant may not assign this Lease or sublet the premises or any part thereof without the prior written consent of Landlord.

10. PROPERTY TAXES. The premises are currently tax exempt. Tenant shall be responsible to pay before delinquency any general property taxes that may be assessed against the premises during the term hereof.

11. INSURANCE. (a) Tenant agrees that it will at its own expense procure and maintain commercial general liability insurance in the amount of not less than $1,000,000 per occurrence. Such insurance shall cover liability arising from premises operations, independent contractors, personal injury, products, completed operations and liability assumed under an insured contract, including but not limited to the activities of Tenant, its employees, invitees and agents. Certificates or copies of said policies, naming the Landlord as an additional insured on a primary and non-contributory basis, including a waiver of subrogation in favor of Landlord, and providing for thirty (30) days' advance notice to the Landlord before cancellation, shall be delivered to the Landlord no later than the date that Tenant begins to occupy the leased premises. A renewal certificate shall be provided to Landlord each year prior to expiration of any policy, upon request.

(b) Tenant will not do or omit the doing of any act which would vitiate any insurance, or increase the insurance rates in force upon the real estate improvements on the premises or upon any personal property of the Tenant upon which the Landlord by law or by the terms of this Lease, has or shall have a lien.

(c) Tenant further agrees to comply with recommendations of Iowa Insurance Services Office, or its successor office, and to be liable for and to promptly pay, as if current rental, any increase in insurance rates on said premises and on the building of which said premises are a part, due to increased risks or hazards resulting from Tenant's use of the premises otherwise than as herein contemplated and agreed.

(d) At each 10-year anniversary of the commencement of this Lease, the parties shall confer in good faith to review the appropriate amount of insurance coverage, and at such time the required coverage amount may be increased by written notice from Landlord to Tenant.

12. INDEMNITY. Except as to the gross negligence of the Landlord or its agents in the performance of any obligation of Landlord under this Lease, Tenant will protect, indemnify, and hold harmless the Landlord, its officers, officials, employees, and agents, from and against any and all claims, demands, causes of action, loss, costs, expenses, damages and liabilities of any type or nature (including but not limited to attorneys' fees and expenses) (each of the foregoing is a "Claim") occasioned by, or arising out of, any accident or other occurrence causing or inflicting injury and/or damage to any person or property, happening or done, in, upon, or about the leased premises, or due directly or indirectly to the tenancy, use, or occupancy thereof, or any part thereof by the Tenant or any person claiming through or under the Tenant. The foregoing indemnity shall include, but is not limited to, Claims of Tenant or any third party for loss, damage or destruction of any personal property or fixtures left on the premises after termination of the tenancy. The provisions of this paragraph shall survive the expiration, abandonment, or termination of this Lease.

13. FIRE AND CASUALTY. In the event of a destruction or damage of the leased premises so that Tenant is not able to authorized activities on the premises, and which damages cannot be repaired within one hundred eighty (180) days, this Lease may be terminated at the option of either the Landlord or Tenant. Such termination

in such event shall be effected by written notice of one party to the other, within ninety (90) days after such destruction. Tenant shall surrender possession within ten (10) days after such notice issues and, each party shall be released from all future obligations hereunder.

14. CONDEMNATION. (a) DISPOSITION OF AWARDS. Should the whole or any part of the leased premises be condemned or taken by a competent authority for any public or quasi-public use or purpose, each party shall be entitled to retain, as its own property, any award payable to it. Or in the event that a single entire award is made on account of the condemnation, each party will then be entitled to take such proportion of said award as may be fair and reasonable.

(b) DATE OF LEASE TERMINATION. If the whole of the leased premises shall be so condemned or taken, the Landlord shall not be liable to the Tenant except and as its rights are preserved as in paragraph 14(a) above.

15. TERMINATION OF LEASE AND DEFAULTS OF TENANT. (a) TERMINATION UPON EXPIRATION OR UPON NOTICE OF DEFAULTS. This Lease shall terminate upon expiration of the term hereof. Upon default by Tenant in accordance with the terms and provisions of this Lease, or upon Tenant's abandonment of the premises by failure to engage in authorized activities on the premises for more than ninety (90) consecutive business days, this Lease may at the option of the Landlord be canceled and forfeited, provided, however, before any such cancellation and forfeiture Landlord shall give Tenant a written notice specifying the default, or defaults, and stating that this Lease will be canceled and forfeited thirty (30) days after the giving of such notice, unless such default, or defaults, are remedied within such grace period. As an additional optional procedure or as an alternative to the foregoing (and neither being exclusive of the other), Landlord may proceed as provided in paragraph 22 below.

(b) BANKRUPTCY OR INSOLVENCY OF TENANT. In the event Tenant is adjudicated a bankrupt or in the event of a judicial sale or other transfer of Tenant's leasehold interest by reason by any bankruptcy or insolvency proceedings or by other operation of law, and such bankruptcy, judicial sale, or transfer has not been vacated or set aside within ten (10) days from the giving of notice thereof by Landlord to Tenant, then and in any such events Landlord may, at its option, immediately terminate this Lease and, upon giving of ten (10) days' written notice by Landlord to Tenant, re-enter said premises, all to the extent permitted by applicable law.

(c) Waiver as to any default shall not constitute a waiver of any other or subsequent default.

16. RIGHT OF EITHER PARTY TO MAKE GOOD ANY DEFAULT OF THE OTHER. If default shall be made by either party in the performance of, or compliance with, any of the terms, covenants, or conditions of this Lease, and such default shall have continued without cure for thirty (30) days after written notice thereof from one party to the other, the person aggrieved, in addition to all other remedies now or hereafter provided by law, may, but need not, perform such term, covenant, or condition, or make good such default, and any amount advanced shall be repaid forthwith on demand, together with interest at the rate of 12% per annum from the date of advance.

17. SIGNS. Tenant shall have the right and privilege of attaching, affixing, painting, or exhibiting signs on the leased premises, provided only that (a) any and all signs comply with the ordinances of the City of Waterloo and with the laws of the State of Iowa, and (b) Landlord has given its prior written approval of any sign.

18. MECHANIC'S LIENS. Neither the Tenant nor anyone claiming by, through, or under the Tenant, shall have the right to file or place any mechanic's lien or other lien of any kind or character whatsoever upon said premises or upon any building or improvement thereon, or upon the leasehold interest of the Tenant therein, and notice is hereby given that no contractor, subcontractor, or anyone else who may furnish any material, service, or labor for any building, improvements, alteration, repairs, salvaging or any part thereof, shall at any time be or become entitled to any lien thereon, and for the further security of the Landlord, the Tenant covenants and agrees to give actual notice thereof in advance to any and all contractors and subcontractors who may furnish or agree to furnish any such material, service, or labor.

19. LANDLORD'S LIEN AND SECURITY INTEREST. Landlord shall have, in addition to the lien given by law, a security interest as provided by the Uniform Commercial Code as codified in the State of Iowa upon all personal property, and all substitutions, replacements, accessories, and accessions thereto and thereof, kept and used on the leased premises by Tenant. Landlord may proceed at law or in equity with any remedy provided by

law or by this Lease for the recovery of rent or for termination of this Lease because of Tenant's default in its performance.

20. SUBSTITUTION OF EQUIPMENT, MERCHANDISE. ETC. Omitted.

21. OTHER PROVISIONS. (a) Either party may record this Lease or a memorandum hereof at any time.

(b) Tenant shall, at its own cost and expense, undertake all work of site preparation and construction necessary to excavate a stormwater detention facility and construct a paved, approximately 100-stall parking lot and up to three pickleball courts on the premises, together with such lighting, fencing, landscaping and other improvements as Tenant may desire, subject to the provisions of this paragraph. Tenant shall submit specific designs and site plans for review and approval by the Waterloo Leisure Services Director and City Engineer before the commencement of construction. The initial site plan is attached hereto as Exhibit "B" for purposes of illustration but may be modified upon mutual consent of the parties. Tenant will use its best efforts to obtain, or cause to be obtained, in a timely manner, all required permits, licenses and approvals, and will meet, in a timely manner, all requirements of all applicable local, state, and federal laws and regulations which must be obtained or met before the Improvements may be lawfully constructed. All improvements shall be constructed in accordance with all applicable building codes and shall comply with all applicable city ordinances and other applicable law. Any future replacements or alterations to the improved premises shall be subject to Tenant's compliance with the provisions of this paragraph that are applicable to original construction.

(c) The parking lot to be constructed by Tenant shall incorporate an existing paved area of eleven (11) parking spaces on the northwest side of the premises. Pursuant to prior agreement between Landlord and the owner of the abutting property (currently DEC Real Estate LC), the abutting owner has the right to use such spaces for its business purposes. Tenant agrees not to interfere with such right of use or direct access thereto from the abutting owner's property.

(d) In connection with the project described in paragraph (b) above, Tenant may make groundscape improvements for surface water control on abutting property to the northwest of the premises and to Landlord's property lying northeasterly of the premises, in accordance with plans and specifications approved in advance by Landlord and Tenant. The parties shall work to obtain permission from the abutting private landowner for access.

(e) Tenant shall be solely responsible for all repair, maintenance and upkeep of the premises and improvements thereon, including but not limited to snow removal, mowing, and weed control. As an alternative to remedies under Section 16, Landlord may, if Tenant fails to repair and maintain the improvements, terminate this Lease if Tenant does not provide to Landlord, within thirty (30) days after delivery of written notice to Tenant, a plan to complete repairs and/or maintenance according to plans and on a time table reasonably acceptable to Landlord. Tenant shall be further responsible for litter control in and around the premises, including but not limited to areas within 50 feet of the premises on any street, sidewalk, or other publicly owned area. Litter shall be picked up no less than weekly, but shall be done as often as required to maintain the premises and surrounding areas in clean condition. Tenant shall be solely responsible for any utility costs relating to the premises.

(f) The parking lot, pickleball courts, and other Tenant improvements shall be available for use by the general public at all times during normal operating hours, except for limited periods when appropriate for use by Tenant's residents, staff, and guests and during special events conducted by Tenant. Tenant's proposed closure of the facilities, whether in whole or in part or whether in accordance with a regular schedule or otherwise, shall be subject to advance approval by the Waterloo Leisure Services Director or successor, which shall not be unreasonably withheld. Tenant may post reasonable regulations regarding use of the premises. Tenant shall provide, at its own cost and expense, any security that Tenant considers necessary or advisable for the protection of Tenant's residents, their guests, and any of their vehicles.

(g) Unless otherwise agreed, any improvements made by Tenant during the Lease term shall become the sole property of Landlord at the expiration of this Lease, without compensation for same to Tenant.

22. RIGHTS CUMULATIVE. The various rights, powers, options, elections, and remedies of either party as provided in this Lease shall be construed as cumulative and no one of them as exclusive of the others or exclusive of any rights, remedies, or priorities allowed either party by law, and shall in no way affect or impair the right of

either party to pursue any other equitable or legal remedy to which either party may be entitled as long as any default remains in any way unremedied, unsatisfied, or undischarged.

23. NOTICES AND DEMANDS. Notices as provided for in this Lease shall be given to the parties hereto at the respective address of each designated on page one of this Lease unless either party notifies the other, in writing, of a different address. Without prejudice to any other method of notifying a party in writing or making a demand or other communication, such message shall be considered given under the terms of this Lease two (2) business days after it is mailed by US registered or certified mail, return receipt requested.

24. RELATIONSHIP OF PARTIES. Nothing in this Lease shall, or shall be deemed or construed to, create or constitute any joint venture, partnership, agency, employment, or any other relationship between the parties, nor to create any liability for one party with respect to the liabilities or obligations of the other party or any other person. Each party hereto is an independent contractor in relation to the other.

25. BINDING EFFECT. Each and every covenant and agreement herein contained shall extend to and be binding upon the respective heirs, personal representatives, successors, and assigns of the parties hereto.

26. CHANGES TO BE IN WRITING. None of the covenants, provisions, terms, or conditions of this Lease to be kept or performed by Landlord or Tenant shall be in any manner modified, waived, or abandoned, except by a written instrument duly signed by the parties and delivered to the Landlord and Tenant. This Lease contains the entire agreement of the parties and supersedes any and all discussions, negotiations, understandings, or agreements pertaining to the subject matter hereof.

27. SEVERABILITY; REFORMATION. If any provision of this Lease is held invalid, illegal, or unenforceable, whether in whole or in part, the remaining provisions of this Lease shall not be affected thereby and shall continue in full force and effect. If, for any reason, a court finds that any provision of this Lease is invalid, illegal, or unenforceable as written, but that by limiting such provision it would become valid, legal, and enforceable, then such provision shall be deemed to be written and shall be construed and enforced as so limited.

28. CONSTRUCTION. Words and phrases herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine, feminine, or neuter, according to the context.

IN WITNESS WHEREOF, the parties hereto have duly executed this Business Property Lease as of the date first written above.

LANDLORD

City of Waterloo, Iowa

By: _____
Quentin Hart, Mayor

Approved by council 8/2/2021

Attest: _____
Kelley Felchle, City Clerk

TENANT

Friends of Faith Retirement Homes, Inc.

By: _____
Lisa Gates, its President/CEO

[acknowledgments on next page]

STATE OF IOWA)
) ss.
BLACK HAWK COUNTY)

On August 2, 2021, before me, the undersigned, a Notary Public in and for the State of Iowa, personally appeared Quentin Hart and Kelley Felchle, to me personally known, and who, being by me duly sworn, did say that they are the Mayor and City Clerk, respectively, of the City of Waterloo, Iowa; that the seal affixed to the foregoing instrument is the corporate seal of the corporation, and that the instrument was signed and sealed on behalf of the corporation by authority of its City Council as contained in the Resolution adopted by the City Council, under Council Action No. 2021-524 of the City Council on August 2, 2021, and that Quentin Hart and Kelley Felchle acknowledged the execution of the instrument to be their voluntary act and deed and the voluntary act and deed of the corporation, by it voluntarily executed.

NOTARIAL SEAL IOWA
NANCY HIGBY
COMMISSION NO.788229
MY COMMISSION EXPIRES
2-3-2024

Notary Public

STATE OF IOWA)
) ss.
BLACK HAWK COUNTY)

Acknowledged before me on August 3, 2021 by Lisa Gates as President/CEO of Friends of Faith Retirement Homes, Inc.

NOTARIAL SEAL IOWA
MICHAEL R. YOUNG
Commission Number 731479
My Commission Expires
11-12-23

Notary Public

EXHIBIT "A"

Description of Leased Premises

See attached.

INDEX LEGEND	For County Recorder's use.
General Description: Part of SW 1/4, Sec. 03–T88N–R13W, Waterloo Surveyor: David L. Scheil (#16775) Surveying Company: Wayne Claassen Engineering & Surveying, Inc. 2705 University Avenue (P.O. Box 898) Waterloo, Iowa 50704 (319)235–6294 Survey Requested By: Clark & Associates Proprietor: Waterloo Board of Park Commission	

EXHIBIT "A"
DESCRIPTION OF LEASED PREMISES

LEGAL DESCRIPTION

That part of the Southwest Quarter (SW 1/4) of Section Three (03), Township Eighty–eight North (T88N), Range Thirteen West (R13W), of the Fifth Principal Meridian, Waterloo, Black Hawk County, Iowa, described as follows:

Beginning at the most Southerly corner of Parcel described in land Deed 570, Page 201 in the Black Hawk County Recorder's Office; thence N32°23'E Four Hundred Seventy–seven and Thirty–six Hundredths (477.36) feet along the Southeast line of said Parcel to the Southwesterly line of Lot Two Hundred Four (204), Crestview Second Addition; thence S60°32'E One Hundred Ninety–two and Thirty–one Hundredths (192.31) feet along the said Southwesterly line, and along the Southwesterly lines of Lot Two Hundred Five (205) and Lot Two Hundred Six (206) said Second Addition to the most Southerly corner of said Lot Two Hundred Six (206); thence S32°23'W Four Hundred Eighty–seven and Fifteen Hundredths (487.15) feet along a line parallel to aforesaid Southeast line to the North right–of–way line of Park Lane; thence N57°37'W One Hundred Ninety–two and Six Hundredths (192.06) feet along said North right–of–way line to the point of beginning containing 2.13 acres.

CES FILE NO. 2762

NOTES:

1. The basis of bearings for this Plat is the North line of Park Lane assigned a bearing of S57°37'E as per land Deed 570, Page 201 in the Black Hawk County Recorder's Office.

CES

CERTIFICATION

I hereby certify that this land surveying document was prepared and the related survey work was performed by me or under my direct personal supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Iowa.

Signature: _____
David L. Scheil, P.L.S.

Date: _____, 20____ License No. 16775

Pages or Sheets Covered by this Seal: 2

My license renewal date is December 31, 2022

WAYNE CLAASSEN ENGINEERING AND SURVEYING, INC.
P.O. BOX 898 WATERLOO, IOWA 50704-0898
PHONE: (VOICE) 319-235-6294
(FAX) 319-235-0028

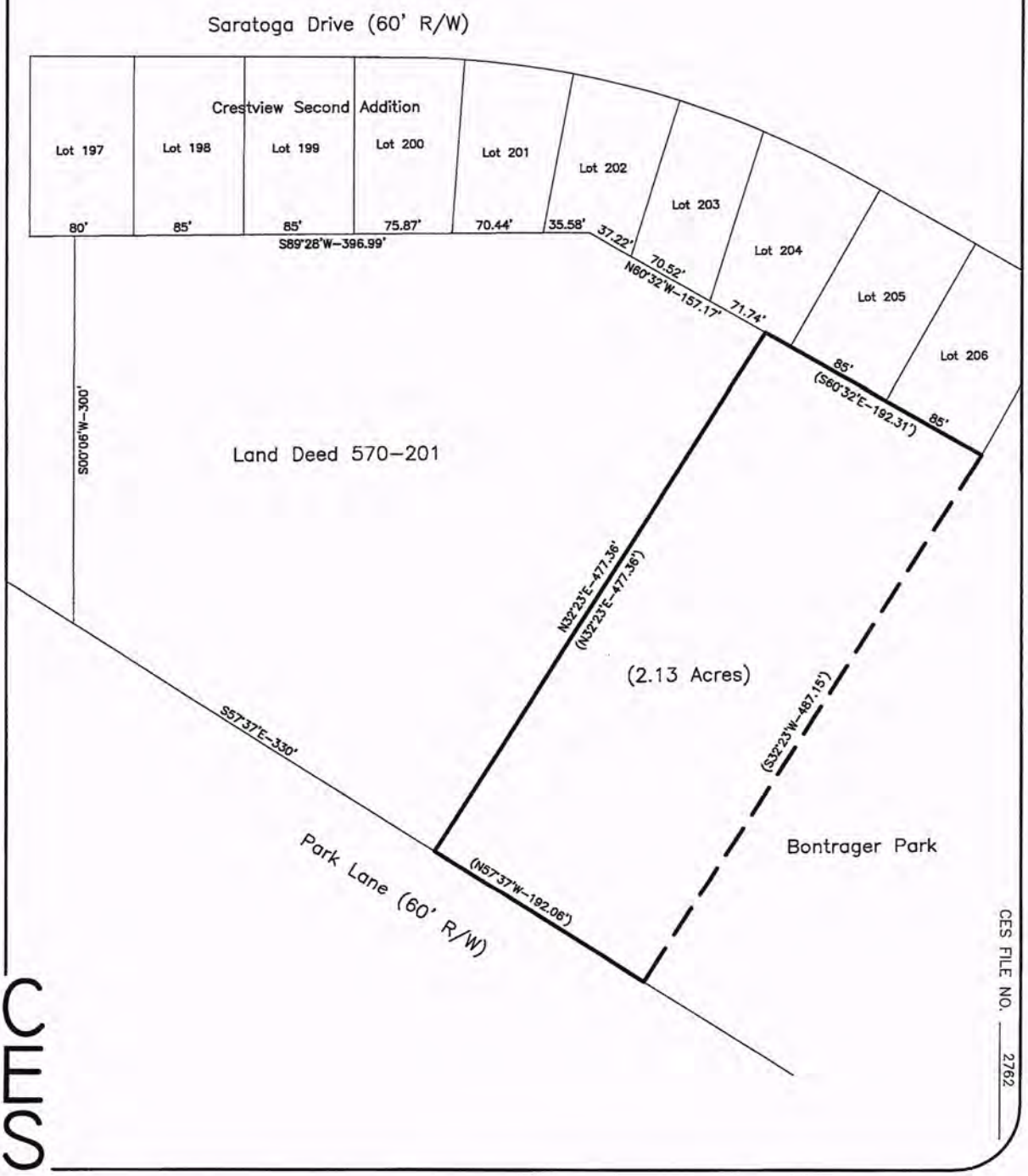
EXHIBIT "A"
DESCRIPTION OF LEASED PREMISES

Part of SW 1/4, Sec. 03-T88N-R13W
Waterloo, Black Hawk County, Iowa
Survey for: Clark & Associates
Proprietor: Waterloo Board of Park Commission

0 100
1 INCH = 100 FEET

SURVEY LEGEND:

000.00 DENOTES RECORD DIMENSION
(000.00) DENOTES FIELD DIMENSION



CES

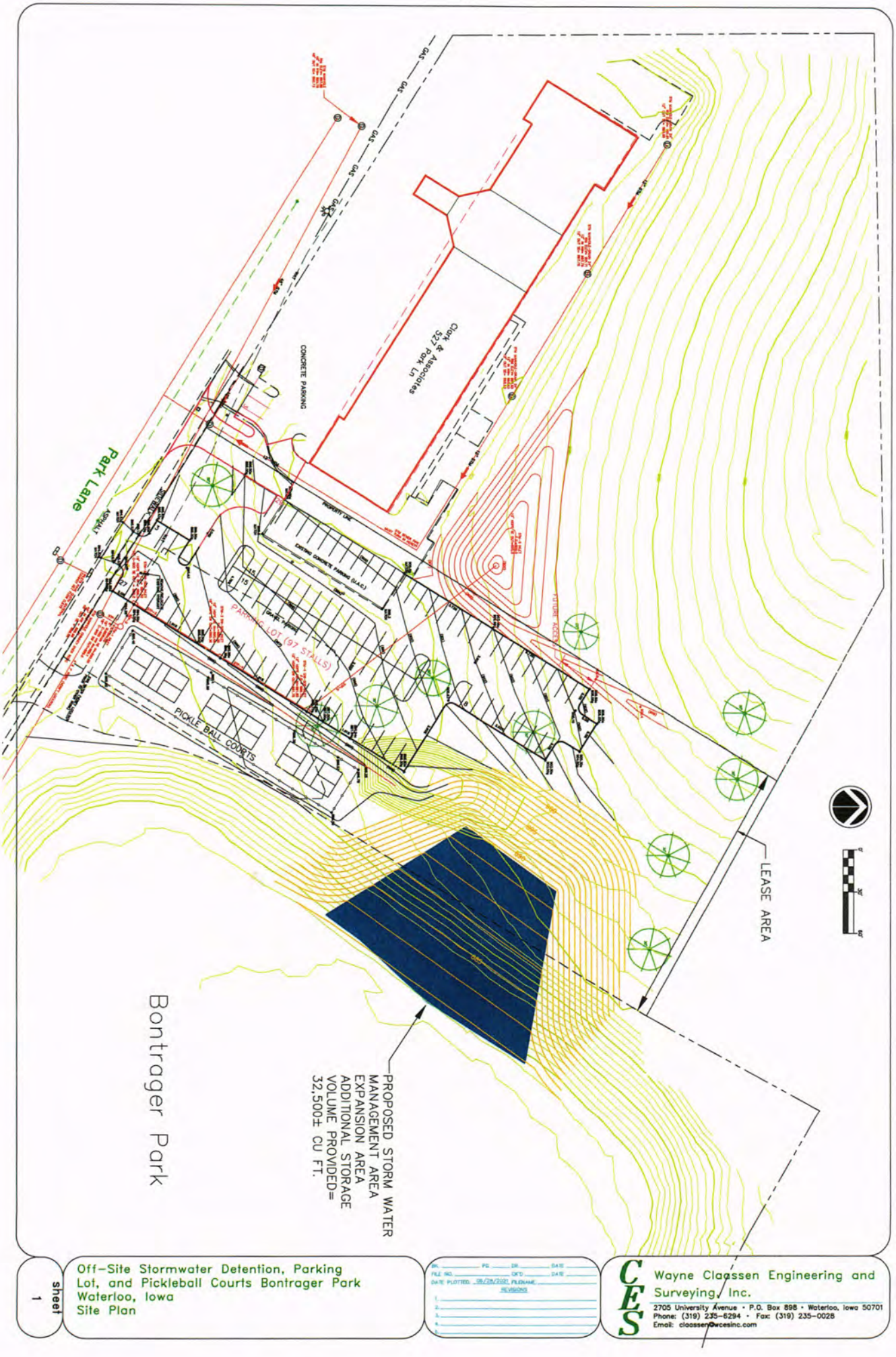
CES FILE NO. 2762

EXHIBIT "B"

Initial Site Plan
(subject to modification)

See attached.

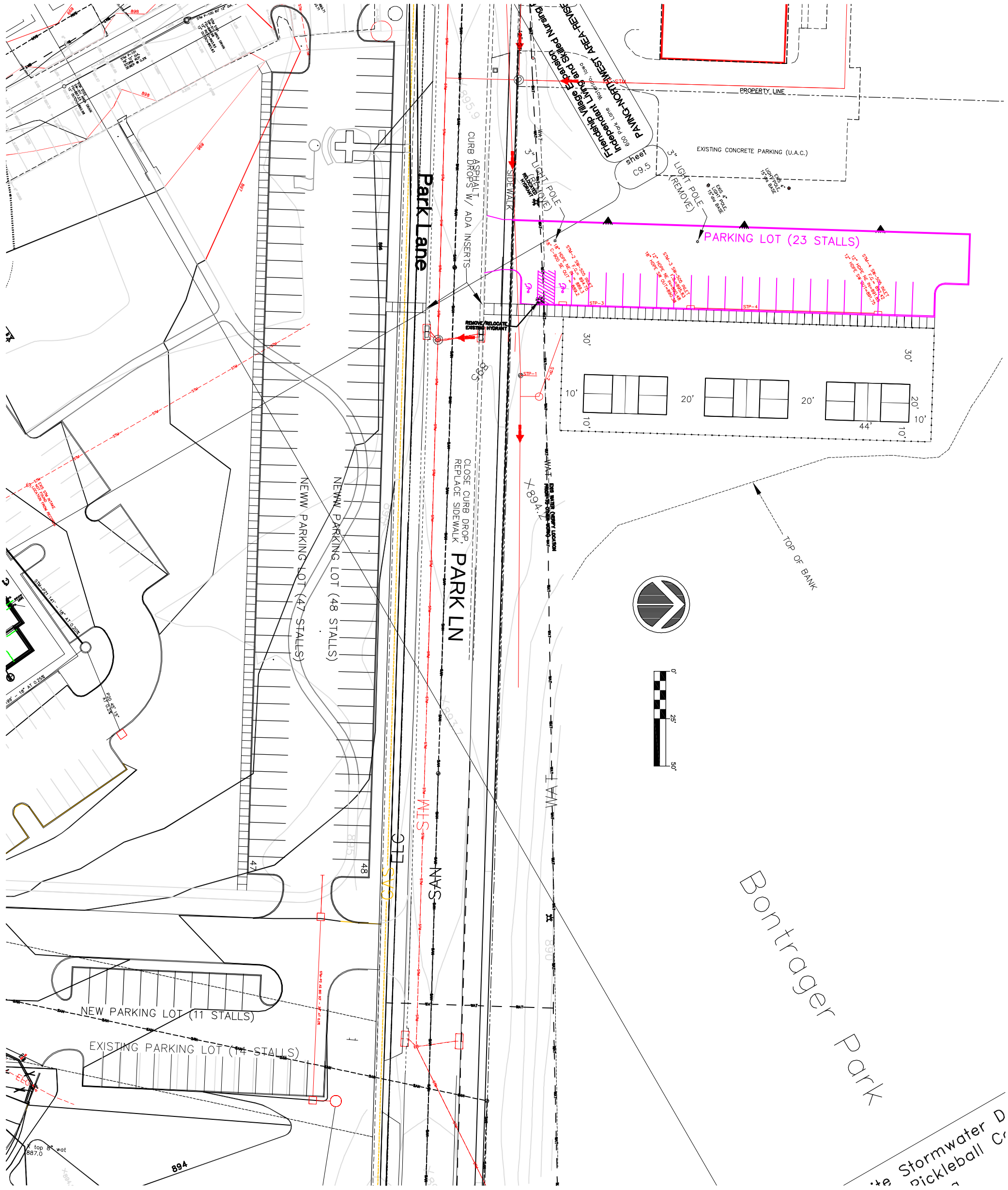
Exhibit B



Off-Site Stormwater Detention, Parking Lot, and Pickleball Courts Bontrager Park
Waterloo, Iowa
Site Plan

sheet 1

Wayne Claassen Engineering and Surveying, Inc.
2705 University Avenue · P.O. Box 898 · Waterloo, Iowa 50701
Phone: (319) 235-6294 · Fax: (319) 235-0028
Email: claassen@wcesinc.com



Park Lane
PARK LN
PROPERTY LINE
EXISTING CONCRETE PARKING (U.A.C.)
PARKING LOT (23 STALLS)
NEWW PARKING LOT (47 STALLS)
NEWW PARKING LOT (48 STALLS)
NEW PARKING LOT (11 STALLS)
EXISTING PARKING LOT (14 STALLS)
CLOSE CURB DROP, REPLACE SIDEWALK
ASPHALT CURB DROPS W/ ADA INSERTS
SIDEWALK
REMOVE/RELOCATE EXISTING HYDRANT
TOP OF BANK
Bontrager Park
Stormwater D
Pickleball C

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Brian Baker, Interim Building Official
Building Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution approving a Professional Service Agreement with Schumacher Elevator, Denver, Iowa, for the replacement of the Waterloo Public Library elevator in the amount of $274,344.00, rescinding Resolution No. 2025-641 in its entirety, and authorizing the Mayor and City Clerk to execute said document.

RECOMMENDED COUNCIL ACTION

Approval for new contract and rescind current contract.

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

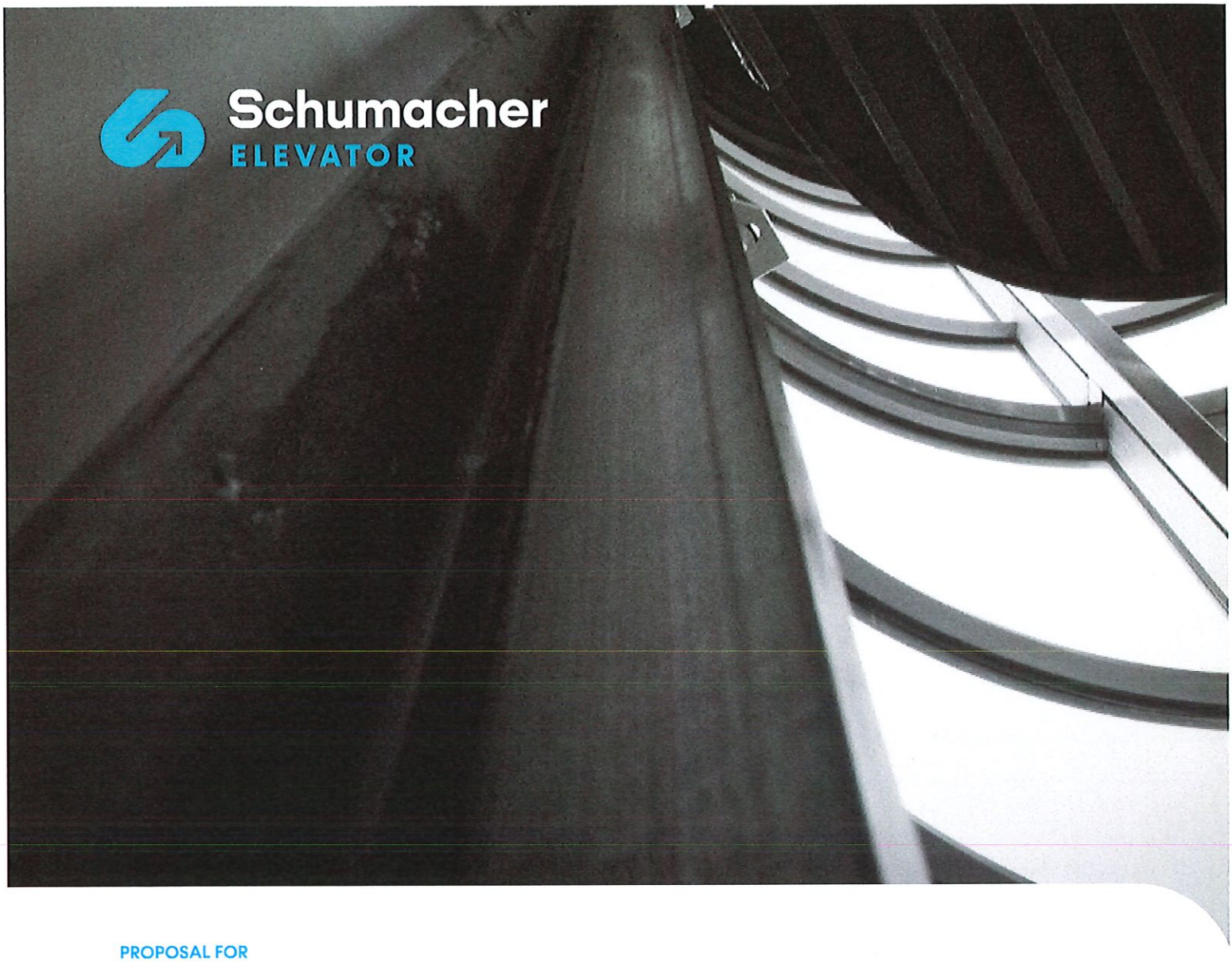
SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. New Contract Schumacher Library Elevator
2. Rescind Resolution No 2025-651 Schumacher Elevator



PROPOSAL FOR

Waterloo Public Library - Hydro Option

Prepared For:
GREG AHLHLEM
WATERLOO PUBLIC LIBRARY
415 COMMERCIAL ST
WATERLOO, IA 50703

Project ID:
SEC003669-2
Revision 2

Proposal Issued:
6/4/2026

Prepared By:
Nick Shinstine
Estimator & Project Manager
nick.shinstine@schumacherelevator.com
(319) 406-1275

Proposal Valid-To:
7/4/2026

Schumacher

Quote Summary

Waterloo Public Library - Hydro Option | SEC003669-2

Proposal Issued 6/4/2026

Package ID	Description	Qty	Price
1	Hydraulic In-Ground / Custom PKG / 2500 lb / 150 fpm / 4 stops / F&R	1	$274,344.00

$274,344.00

This proposal outlines the scope of work, equipment specifications, and pricing. It is based on the project requirements and site conditions known at the time of issuance. Any modifications, unforeseen conditions, or additional requests may require a revised proposal or change order. A fully executed contract agreement is required to commence work. Projects will not be scheduled for production until all necessary approvals are received.

- All equipment provided by Schumacher Elevator Company is non-proprietary allowing the owner the highest degree of flexibility in terms of maintenance and repair at the most competitive rates.
- Proposal includes complete new 850 series cab.
- Proposal does NOT include any related work to bring items related to the elevator up to code. If a turnkey price is needed, please reach out as we will need to get updated quotes from GC's.
- Proposal includes labor rates for installation on or before 12/31/2026.

Schumacher

Scope of Work

Waterloo Public Library - Hydro Option | Package ID: 1

General Notes	Proposal dimensions are for estimating purposes only and not for construction use. All dimensions and components are to be verified during the engineering process and are subject to change.
Package Details	Project Type: Mod Package ID: 1 Package Type: Custom Package Quantity: 1 Code Compliance: 2019
Elevator Specifications	Elevator Type: Hydraulic Sub-Type: In-Ground Capacity: 2500 Loading Class: Passenger Speed: 150 FPM Travel: 30'0" Stops: 4 Openings: 4 (Front: 3 | Rear: 1 | Side: 0) Operation: Simplex Door Type: Passenger Entrance Size: 3'6" x 7'0" Door Locations: Front LH / Rear RH Cab Layout: Standard Cab Cab Size: 6'8" x 4'3" x 8'0"
Building Notes	Power Supply: 480 volt / 3 phase Control Space/Room: Adjacent Pit Access: Bottom Landing Non-seismic conditions
Cab Equipment	Cab Package: 850 Series Car Doors: MAC 3'-6" x 7'-0" Car Ventilation: Nylube X12F9 (x1) Cartop: Steel Cartop Railing Package Ceiling & Lighting Series: CS4 - Stainless Island Ceiling Panel Finish: Stainless Cab Lighting Trim: Black Handrails: Stainless #4 Rectangle Hollow - 2 high x 1/2 thick (hollow) Offset Panels (Horizontal): Stainless Steel Offset Panels (Vertical): Plastic laminate with banded stainless steel edges Wall Panels: 14 ga steel with powder coat finish
Cab Rendering	

Fixtures	Schumacher Fixtures Car Position Indicator: Schumacher Car Station: #4 Stainless Swingout with Flush Dome Buttons Phone: Wurtec 2-Way Visual Communication Hall Position Indicator: Ground Floor Only Hall Stations: #4 Stainless Surface Mount with Flush Dome Buttons Fire Service Indicator in hall Hall Access Switch(es): Top & Bottom Line Loss Key Switch Phase I Hall Switch: FEO-K1-3P, 2KP Hall Station Tri-Flame: Stainless Sign Car Traveling Lantern Jamb Braille: Black Background + White Text
Door Operator Equipment	Door Screen: FCU47 (2D) Hatch Door Operator Equipment Car Door Operator Equipment Door Operator: PMSSC
Entrance Equipment	Peelle Complete Entrance Assembly (x4) Stainless #4 Finish Single Speed (3'-6" x 7'-0") Aluminum Entrance Sill
Controller Equipment	Controller: Schumacher Hydro SS-APS (Serial) Cartop inspect station Landing Package: CEDES Hydro Serial Limit Switches / Brackets / Cams Motor Starting: Soft Start STOCKED STARTER (NORDIC 22 - 85 FLA)
Jack Equipment	Jack Manufacturer: EECO Hydraulic Jack PJR-4 Jack Quantity: 1 Jack Sections: 3 Piston OD: 4.375 Cylinder Protection: Flexible Jack Liner Leak Monitoring: Plastic Tube
Sling & Platform	Sling & Platform Assembly Package Toe Guard Toe Guard Brace Stamped Crosshead Data Plate Guides: ELPRO 816DS Car Sill: Aluminum

Power Unit Equipment	Shut-off valves in pit (x1) & machine room (x1) Maxton Valve UC4M-E2, 2" THD Tank: L47.5" X D21.5" X H57" Submersible Pump (SEIM PA 055#4D) Power Unit Silencer Power Unit Assembly Package (Submersible) x1 Estimated System Oil: 86 gal Piping Package: PIPING PKG(2-IN PIPE/2-IN INLET) Dipstick Assembly System Oil: Conventional ISO 32 Submersible Motor 33HP80S/25HP120S 230/460V 3PH SUB ELMO-V
Hoistway Equipment	Under Car Light (Nylube) Multi-Cable (18GA, 42 Wire) Electrical Package Travel Cable Oil Container (Drilled with Romex) 5 gal (x1) Oil Return Tubing: 1/2" Plastic Pit Channel Package 5'-0"

Schumacher

Project Milestones

Schumacher's Responsibility	Purchaser's Responsibility	Shared Responsibility

Agreement
A fully executed contract is required to commence work, ensuring a mutual understanding and commitment to project terms, timelines, and deliverables.

Survey
If needed, Schumacher conducts a site survey to confirm project specifications before moving forward.

Submittal
Engineering reviews project specifications and prepares detailed drawings.

Approval
Purchaser provides written approval that all submittal drawings are approved, allowing Schumacher to proceed with production and the purchase of long lead-time items.

Please note: Projects are not scheduled for production until Schumacher has received full approval.

Production
All necessary materials and components are manufactured and procured with the highest quality standards in preparation for a seamless installation.

Delivery
Prior to shipment, all jobsite absolutes must be met. Purchaser has 14 days to accept delivery of equipment upon completion of production (or storage fees may apply). Schumacher coordinates delivery to ensure all items arrive safely and on schedule.

Installation
Schumacher installs equipment, ensuring all components are assembled according to the approved plans and specifications. Installation is completed with attention to safety, quality, and efficiency.

Handoff
Final inspection and testing is completed, and the elevator system is officially handed off to Purchaser, signifying project completion and readiness for use.

Schumacher

Obligations of Owner

The following work is the responsibility of the Owner, and at no cost to Schumacher Elevator Company. All work to be performed per the latest revision of the applicable national code and/or local code.

GENERAL WORK

a. Provide all cutting of walls, floors or partitions, together with all repairs made necessary by such cutting or changes;
b. Provide a staging and storage area close to the elevator hoistway;
c. Provide for removal of all spoils and debris accumulated during excavation from the lowest landing of the premises as required;
d. Both legal hoistway and machine room must be maintained at a temperature range 55°F - 85°F;
e. Provide proper support and install inserts provided by Schumacher Elevator Company as shown on G-1 print of the approved drawings;
f. Provide a legal machine room of adequate size, properly ventilated, lighted and heated per Elevator Code;
g. Provide routing for hydraulic and electrical lines;
h. Provide and install heat and smoke detectors as required;
i. Complete all this work in such time as not to delay work of Schumacher Elevator Company;
j. The price and installation schedule of Schumacher Elevator Company is based on these jobsite conditions existing at the beginning and during installation of the elevator equipment;
k. Complete all work prior to state inspection, if reinspection is required, the cost will be shared by the parties involved.
l. Provide a fire extinguisher in the machine room or in a location convenient to the machine space.
m. In accordance with code, if sprinklers are installed in hoistway, machine room, control space or machine space, provide means to automatically disconnect the main line power supply of the affected elevator and any other power supplies used to move the elevator upon the application of water is required (*Not applicable in the state of Minnesota*);

HOISTWAY & PIT WORK

n. Provide a legal hoistway of proper size with adequate pit depth, overhead height and be constructed to withstand forces and loads resulting from the use of the elevator;
o. Provide code compliant means to extract water from the pit;
p. Provide a hoisting beam as required at top of hoistway for digging and hoisting;
q. Provide all necessary sill supports;
r. Fill in around jack hole in pit, build in around door frames and grout under sills, as required by elevator contractor;
s. Provide all cutting of walls, floors or partitions, together with all repairs made necessary by such cutting or changes;
t. Provide all painting including hoistway doors and frames furnished with prime finish;
u. Provide means to guard and protect the hoistway during the time the elevator is being installed;
v. Provide sump pump and sump pit in elevator hoistway floor;

ELECTRICAL WORK

w. Electrical disconnects, one for three phase and several single-phase power supplies, with properly sized wires, as require by the manufacturer;
x. Provide standby power unit and means for starting it, that will deliver enough regulated power to the elevator disconnect switches to operate one or more elevators at a time at full-rated speed;
y. Provide electrical power to machine room and connect to controller terminals, with an intervening fused disconnect properly located in machine room, including shunt trip breakers, if required;
z. Provide a transfer switch for each feeder for switching from normal power to standby power and a contact on each transfer switch closed on normal power supply with two wires from this contact to one elevator controller;
aa. Provide means for absorbing power regenerated by the elevator system when running with overhauling loads such as full load down;
bb. Provide any required emergency power of adequate size to include switch gear and preconditioning signals, which may be required;
cc. Provide without charge, adequate power for excavation and tools during construction, starting, testing, and adjusting of equipment;
dd. Provide a separate 110-volt AC, 15-amp circuit fused disconnect terminated at controller;
ee. Provide GFI outlet and guarded light and switch;
ff. Provide means to guard and protect the hoistway during the time the elevator is being installed;
gg. When replacing an elevator controller, permanent hoistway lighting must provide 10 foot-candles at all points of the hoistway, measured with car top lights off. Install three-way switches at the pit and top landing access points. Refer to IAC 72.12(7) for complete requirements.
hh. ASME A17.1 2019 & IBC 2018 Code - Emergency Operation & Signaling Devices

For states that have adopted the ASME A17.1 2019 code or IBC 2018 the owner shall provide in addition to a dedicated analog phone line [1] an ethernet connection with internet access to the controller cabinet in the machine room. Per code, the ethernet connection is required to have 4-hour back-up power in the event power loss.

[1] Other options may be substituted such as cellular or VOIP. Please consult your local IT or telecom provider. This option still requires back-up power and must be communicated with your Schumacher Elevator Representative

*Fire control panel by others- per National Fire Alarm Code 6.15.3.2

The owner agrees to indemnify and hold harmless Schumacher Elevator Company against all claims, damages, losses, expenses, fines, and penalties, including but not limited to attorneys' and/or consultants fees, arising out of or resulting from the failure of the owner to carry out any obligations of the owner outlined in the foregoing agreement.

Schumacher

Contract Agreement

SEC003669-2 | VALID TO 7/4/2026

This Contract Agreement is entered into effective as of 6/4/2026 by and between Schumacher Elevator Company, an Iowa corporation, located in Denver, Iowa acting as an independent contractor and hereinafter referred to as the "Supplier," and WATERLOO PUBLIC LIBRARY, of WATERLOO, IA, hereinafter referred to as the "Purchaser."

That for consideration herein expressed, it is agreed by and between the parties as follows:

SECTION 1 – AGREEMENT

Supplier agrees to furnish all labor, material, equipment, and supervision necessary to perform and complete the Scope of Work described in the attached proposal document for the base price of $274,344.00 plus the sum of any accepted options or alternates included in the Scope of Work.

SECTION 2 – CONTRACT DOCUMENTS

The Contract Documents consist of this Contract Agreement (hereinafter "Agreement"), exhibits, and supplemental documents such as drawings, schedules, specifications, and addenda provided such exhibits and supplemental documents are attached to this Agreement or described in this Agreement or an exhibit to this Agreement with sufficient clarity to enable each party to understand that the exhibits and other supplemental documents are part of this Agreement. This Agreement and any exhibits and supplemental documents that meet the criteria of the preceding sentence represent the entire integrated agreement between the parties hereto and supersede all prior negotiations, representations, proposals, quotations, or agreements whether written or oral.

SECTION 3 – GENERAL TERMS & CONDITIONS

1. Contract price is based on project receiving final engineering approval and being scheduled for production by 12/1/2026. If project has not received final engineering approval and been scheduled for production by 12/1/2026, the price shall be adjusted to reflect any increase in the cost of materials, including but not limited to the cost of major components and subcomponents purchased from third parties, and any increase in labor costs between the date of this contract and the date Supplier schedules the project for production after having final engineering approval. Purchaser shall execute a change order confirming the change in price upon receipt of documentation of the cost increases from Supplier.
2. Supplier's design specifications supersede any descriptions or specifications in Purchaser's bid documents. Purchaser recognizes that minor differences in design, dimensions, and appearance between the product(s) supplied and the specifications are to be expected and are not a breach of this Agreement or a defect in the products manufactured by Supplier.
3. Supplier will commence work at the job site upon the Purchaser's completion of "Construction Requirements" form. All checklist items on the form must be completed prior to mobilization. If Supplier is unable to deliver materials and commence work on the scheduled start date, Purchaser will be responsible for storage at a rate of $500 per week/per elevator.
4. In the event Purchaser or Owner demands that Supplier stop work at the jobsite due to circumstances beyond the Supplier's control, a remobilization fee of $3,000 will be added to the contract price. A fully executed change order confirming Purchaser's agreement to pay the $3,000 remobilization fee is required for Supplier to return to the jobsite.
5. Supplier will complete the scope of work during regular working hours of 6:00 A.M. to 5:00 P.M. (not to exceed 8 hours per day for new construction and 10 hours per day for alteration of existing elevators and in either case not to exceed 40 hours in a work week) during regular working days of Monday to Friday, excluding holidays. Expedited work schedules can be arranged between the Supplier and the Purchaser with a fully executed change order specifying the additional compensation to be paid for the expedited work.
6. Contract price includes (1) elevator inspection by the local authority having jurisdiction. Additional inspections by other entities and re-inspections due to code violations not caused by Supplier are not included, and subsequent inspections will be charged at a rate of $1,250 for re-inspections without Supplier present, and at a rate of $3,000 for re-inspections requiring Supplier to be present. A fully executed change order is required prior to Supplier performing re-inspections.
7. Supplier will notify Purchaser in writing when the Project has been completed. Purchaser will complete Supplier's "Ready for Inspection" form. All checklist items on the form must be completed prior to scheduling the inspection. The inspection will occur within (10) business days of Supplier receiving confirmation that the checklist items have been completed, or at the authority having jurisdiction's earliest convenience. At conclusion of elevator inspection, Purchaser shall have an authorized representative execute the uniform "Acceptance for Use" form.
8. At the conclusion of the project, the Supplier will perform safety, full load, and fire service tests to ensure that each elevator conforms to all applicable codes.
9. Temporary use and construction use of the elevator is not permitted unless approved by Supplier in writing. If Supplier agrees to temporary use of the elevator, Purchaser will sign Supplier's "Acceptance for Temporary/Construction Use" form to authorize any temporary use. Temporary Use will be provided at a rate of $1,000 per month for a hydraulic elevator and at a rate of

$1,350 per month for a traction elevator. Temporary use will not cause the warranty period for Supplier's installation services to commence. The warranty period for Supplier's installation services will not commence until there is an executed "Acceptance for Use" form. Purchaser will be responsible to pay for replacement materials that are due to vandalism, damage, or misuse during the temporary use timeframe.

10. Elevator "runtime" is not included in this Agreement. If runtime is requested by Purchaser and provided by Supplier, Purchaser will be billed for runtime at the rate of $250/hour for runtime provided during normal business hours, and the rate of $285/hour for runtime provided on overtime. Purchaser will sign an "Authorization for Runtime" form prior to the Supplier performing any runtime.
11. All work performed outside of the scope of this Agreement will be billed to Purchaser at a single worker rate of $250 per man hour for regular time (6am to 5 pm) and $420 per man hour for overtime (after 5pm and before 6am or over 8 hours per day or 40 hours in a workweek), plus any expenses. A team hour (a mechanic and an apprentice) will be billed at a rate of $450 per hour for regular time and $750 per hour for overtime, plus any expenses. Purchaser must enter into a change order describing the additional work and confirming the applicable rate before Supplier is required to perform work outside the scope of this Agreement.
12. Supplier will provide the following electronic closeout documents: standard owner's information manual, standard final as built drawings, and Supplier's standard warranty. One paper copy of the closeout documents will be provided at the Purchaser's request. Additional paper copies are available at $350 per set.
13. The terms of this Agreement shall not be supplemented or amended by Purchaser's bid documents or a contract provided by Purchaser. This Agreement sets forth the entire agreement between the parties. If the Purchaser accepts the terms of this Agreement by issuing a purchase order, Supplier shall not be bound by any of the terms in the purchase order, and none of the terms in the purchase order shall have the affect of amending, modifying or nullifying any of the terms of this Agreement. In the event of a conflict between the terms of Purchaser's purchase order and this Agreement, the terms of this Agreement shall govern the contractual relationship between Supplier and Purchaser.
14. Neither party shall be liable to the other party hereunder for special, indirect, consequential, exemplary or incidental damages.
15. Supplier will secure and maintain minimum insurance coverage to protect against claims for bodily injury or death, or for damage to property, which may arise out of the operations by the Supplier or by anyone employed by them. Certificates of Workers' Compensation, Employer's Liability, and Commercial General Liability, Commercial Automobile Liability, and Umbrella/Excess Liability will be furnished to the Purchaser upon request.
16. If Purchaser terminates or cancels this Agreement, Purchaser shall be liable for all costs incurred by Supplier through the date of Supplier's receipt of Purchaser's written notice of cancellation. Purchaser agrees to pay any cancellation fees within ten (10) days of the cancellation date.

SECTION 4 – PAYMENT TERMS

Milestone	Description	Percentage	Timing
Down Payment	Reserves spot on master schedule, begins submittal, engineering, and procurement process	25%	Billed upon execution of contract. Payment due Net 30 days.
Progress Billings	Storage and delivery of material, mobilization, field installation	Percentage of Completion	Billed monthly by the 20th of the month; for work completed through the end of the current month. Payment due Net 30 days.

- All change orders must be executed prior to the performance of the work described in the change order. However, if Purchaser instructs or directs Supplier to provide work outside the scope of this Agreement and the work is performed by Supplier without first obtaining a change order, then the change order must be signed by Purchaser prior to Supplier having an obligation to schedule the final inspection.
- If final payment is not made within 30 days of the final progress billing, the Supplier shall be relieved of the obligation to honor its warranty and any obligations to provide the warranty maintenance.
- Purchaser agrees to pay interest at the rate of 1.5% per month or 18% APR on all past due account balances.
- Purchaser agrees to pay all collection costs incurred to collect past due account balances. Collection costs include all reasonable attorney fees, collection agency fees, court costs, and litigation expenses.
- Purchaser agrees that should legal action become necessary to enforce collection of past due account balances, jurisdiction and venue shall be in the Iowa district court in Bremer County, Iowa.
- Any tax or other governmental charge imposed upon the sale of the goods shall be paid by Purchaser, and Purchaser's failure to pay any applicable tax shall be a breach of this entire agreement.

SECTION 5 – WARRANTY

There are two components to Supplier's warranty. Supplier warrants and guarantees it shall perform its labor in a skillful manner. Supplier also provides a limited warranty regarding the products manufactured by Supplier.

Supplier's labor (workmanship) is guaranteed for a period of (1) year from the date of the executed "Acceptance for Use" form for each elevator. The workmanship warranty excludes ordinary wear and tear, improper use, vandalism, abuse, misuse, neglect, or any other causes beyond Supplier's control. This express limited warranty with respect to workmanship is in lieu of all other warranties, express or implied, including any warranties of merchantability or fitness for a specific purpose.

The terms of Supplier's limited warranty with respect to products manufactured by Supplier are set forth in the "Standard Warranty-Packages & Components" attached as Exhibit A.

SECTION 6 – INDEMNIFICATION

Supplier shall indemnify and hold Purchaser harmless from and against all claims, damages, losses, and expenses arising out of or resulting from any negligent act or omission of Supplier, Supplier's Contractors, or anyone directly or indirectly employed by Supplier or Supplier's Contractors. Supplier shall not be obligated to indemnify or hold Purchaser harmless for any claims, damages, losses, and expenses arising out of or caused in whole or in part by any act or omission of Purchaser, Purchaser's other contractors and Contractors, or anyone directly or indirectly employed by or supervised by Purchaser or Purchaser's other contractors or Contractors.

SECTION 7 – RISK OF LOSS

Risk of loss shall pass to Purchaser as soon as the materials and equipment are delivered to the Purchaser. Purchaser shall pay all costs of insurance from the time that risk of loss passes to Purchaser.

SECTION 8 – FORCE MAJEURE

Supplier shall not be responsible for any delivery or failure to make delivery of all or any part of the goods purchased under this agreement due to federal, state, or municipal action, statute, ordinance, or regulation, strike or other labor trouble, acts of God or natural disasters, riot or other civil disturbance, inability to secure raw materials or supplies, or, without limiting the foregoing, by any other cause, contingency, or circumstance within or without the United States not subject to Supplier's control which prevents or hinders the manufacture or delivery of the goods sold hereunder. The provisions of this paragraph shall not be limited by any provision in which time is made of the essence.

SECTION 9 – ACCEPTANCE

Your signature below signifies acceptance of this contract agreement. A binding contract agreement is required to commence work.

Schumacher

Contract Agreement

Purchaser	Supplier
Purchaser:	Supplier: Schumacher Elevator
Signature:	Signature:
Name:	Name:
Title:	Title:
Date:	Date:
Do you need to issue a purchase order?	P.O. Number:

Schumacher

Exhibit A

STANDARD WARRANTY – PACKAGES & COMPONENTS

Schumacher Elevator Company warrants all manufactured products to be free of defects in material and workmanship under normal and intended use conditions for a period of 1 year from the date of shipment from our factory.

During the term of the warranty, Schumacher Elevator Company will replace any product manufactured by Schumacher Elevator Company which is confirmed to be defective in material and/or workmanship by inspection at our factory. This warranty excludes ordinary wear and tear, improper installation by others, improper use, vandalism, abuse, misuse, neglect, or any other causes beyond the control of Schumacher Elevator Company.

This warranty is voided if products are improperly exposed to the elements. The warranty is also voided if the manufactured products are altered or modified in any manner, including modifications or alterations to the circuitry.

This warranty is also voided if improper wiring methods are used during installation of the manufactured products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A SPECIFIC PURPOSE.

Schumacher Elevator Company will not be liable for any contingent or consequential costs such as the cost of installation of replacement or repaired products, travel expense, or any other expense incurred in connection with the replacement or repair.

Schumacher Elevator Company will not be liable for loss of profits, or any other indirect, consequential, or incidental damages.

Products not manufactured by Schumacher Elevator Company are not covered by this warranty. If Schumacher Elevator Company has purchased products from another manufacturer and resold such products to the Purchaser, the standard warranty provided by the third-party manufacturer, if any, will apply. The Purchaser is encouraged to refer to the description of warranty terms offered by third-party manufacturers in their respective O&M Manual.

This warranty replaces and supersedes any and all previous warranties offered by Schumacher Elevator Company.

WARRANTY EXCHANGE – PACKAGES & COMPONENTS

To begin the warranty exchange process, the Purchaser should contact our inventory department to request trouble shooting assistance and to obtain a Return Material Authorization (RMA) number. If Schumacher Elevator Company determines that an exchange is necessary, the replacement product will be sent via the appropriate shipping method along with the RMA number.

The Purchaser will be responsible for the cost of shipping the product in question, freight prepaid, with the RMA number included, to our factory for evaluation within thirty (30) days of the RMA being issued.

If the product in question is not shipped to Schumacher Elevator within 30 days of Purchaser's receipt of the replacement product, the Purchaser will be invoiced the full purchase price of the replacement product. No credit will be offered if the product in question is not returned within 30 days. Upon receipt of the product in question, Schumacher Elevator will perform a full evaluation to determine whether the product has any defects in material or workmanship not caused by exclusions to Schumacher Elevator Company's warranty. If the evaluation determines that there are no defects in material or workmanship or existing defects are the result of a warranty exclusion, the Purchaser will be invoiced the full purchase price of the replacement product.

When returning products to Schumacher Elevator Company, the Purchaser is encouraged to use a trackable shipping method. Schumacher Elevator Company is not responsible for products lost, stolen or damaged in the course of shipping the products to Schumacher Elevator Company.

Schumacher

Contact Information

Billing Information

Company Name:

Street:

City: State: ZIP:

Billing Contact Name: Title:

Email: Phone:

Ship-To Information

Location Name:

Street:

City: State: ZIP:

Contact Name: Title:

Email: Phone:

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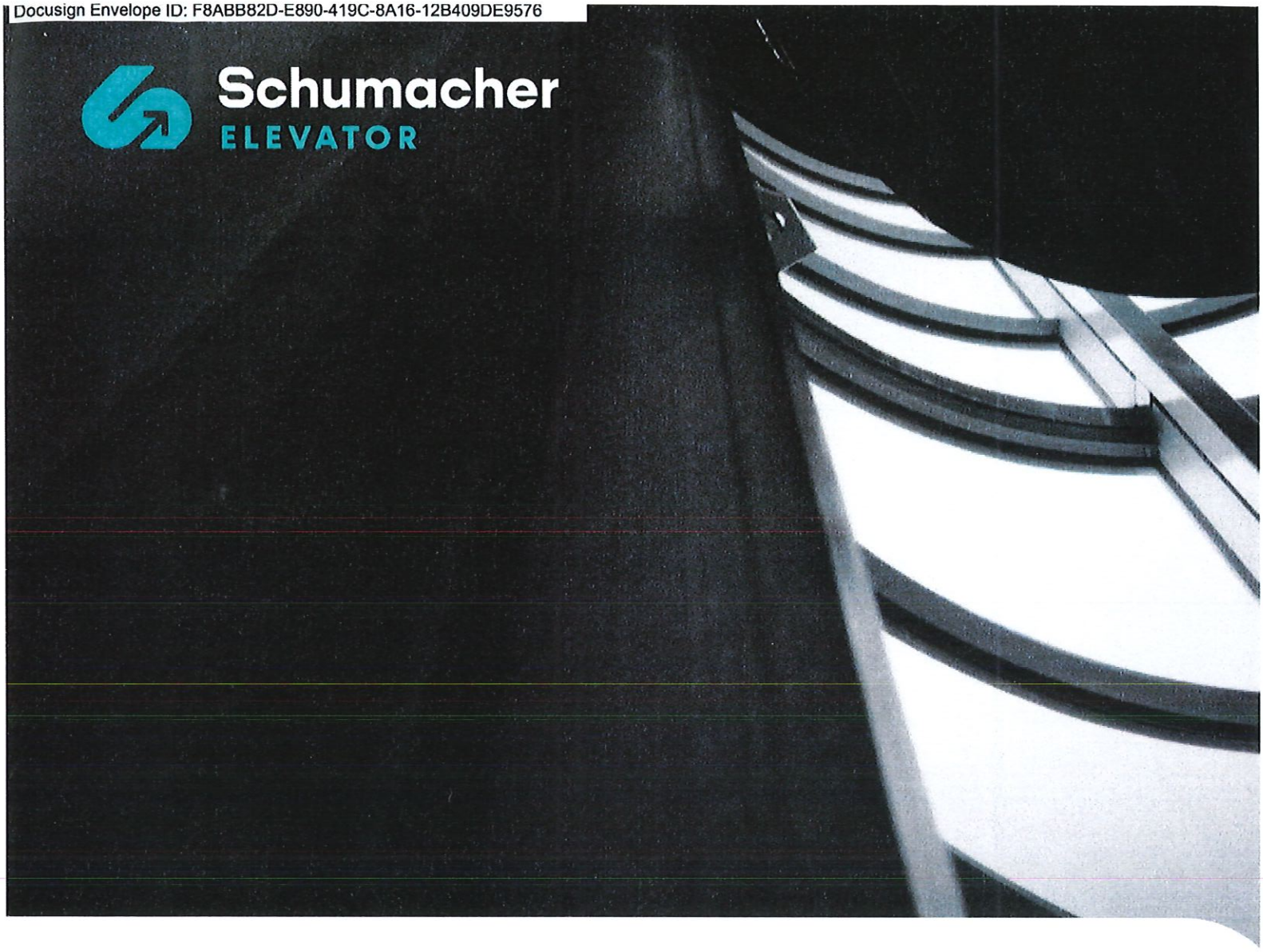
Schumacher ELEVATOR



PROPOSAL FOR

Waterloo Public Library

Prepared For:
GREG AHLHLEM
WATERLOO PUBLIC LIBRARY
415 COMMERCIAL
WATERLOO, IA 50703

Project ID:
SEC003669-1
Revision 2

Proposal Issued:
3/26/2026

Prepared By:
Nick Shinstine
Estimator & Project Manager
nick.shinstine@schumacherelevator.com
(319) 406-1275

Proposal Valid-To:
4/25/2026

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Schumacher

Quote Summary

Waterloo Public Library | SEC003669-1

Proposal Issued 3/26/2026

Package ID	Description	Qty	Price
1	Traction Overhead / Custom PKG / 2500 lb / 250 fpm / 4 stops / F&R	1	$276,520.00

$276,520.00

This proposal outlines the scope of work, equipment specifications, and pricing. It is based on the project requirements and site conditions known at the time of issuance. Any modifications, unforeseen conditions, or additional requests may require a revised proposal or change order. A fully executed contract agreement is required to commence work. Projects will not be scheduled for production until all necessary approvals are received.

- All equipment provided by Schumacher Elevator Company is non-proprietary allowing the owner the highest degree of flexibility in terms of maintenance and repair at the most competitive rates.
- Proposal includes complete new 850 series cab.
- Proposal does NOT include any related work to bring items related to the elevator up to code. If a turnkey price is needed, please reach out as we will need to get updated quotes from GC's.
- Proposal includes labor rates for installation on or before 12/31/2026.

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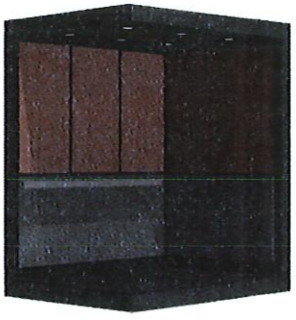
Scope of Work

Waterloo Public Library | Package ID: 1

General Notes	Proposal dimensions are for estimating purposes only and not for construction use. All dimensions and components are to be verified during the engineering process and are subject to change.
Package Details	Project Type: Mod Package ID: 1 Package Type: Custom Package Quantity: 1 Code Compliance: 2019
Elevator Specifications	Elevator Type: Traction Sub-Type: Overhead Capacity: 2500 Loading Class: Passenger Speed: 250 FPM Travel: 30'0" Stops: 4 Openings: 4 (Front: 3 | Rear: 1 | Side: 0) Operation: Simplex Door Type: Passenger Entrance Size: 3'6" x 7'0" Door Locations: Front LH / Rear RH Cab Layout: Standard Cab Cab Size: 6'8" x 4'3" x 8'0"
Building Notes	Power Supply: 480 volt / 3 phase Pit Access: Bottom Landing Non-seismic conditions
Cab Equipment	Cab Package: 850 Series Car Doors: MAC 3'-6" x 7'-0" Car Ventilation: Nylube X12F9 (x1) Cartop: Steel Cartop Railing Package Ceiling & Lighting Series: CS4 - Stainless Island Ceiling Panel Finish: Stainless Cab Lighting Trim: Black Handrails: Stainless #4 Rectangle Hollow - 2 high x 1/2 thick (hollow) Offset Panels (Horizontal): Stainless Steel Offset Panels (Vertical): Plastic laminate with banded stainless steel edges Wall Panels: 14 ga steel with powder coat finish
Cab Rendering	

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Fixtures	Schumacher Fixtures Car Position Indicator: Schumacher Car Station: #4 Stainless Swingout with Flush Dome Buttons Phone: Wurtec 2-Way Visual Communication Hall Position Indicator: Ground Floor Only Hall Stations: #4 Stainless Surface Mount with Flush Dome Buttons Fire Service Indicator in hall Hall Access Switch(es): Top & Bottom Line Loss Key Switch Phase I Hall Switch: FEO-K1-3P, 2KP Hall Station Tri-Flame: Stainless Sign Car Traveling Lantern Jamb Braille: Black Background + White Text Voice Annunciator
Door Operator Equipment	Door Screen: FCU47 (2D) Hatch Door Operator Equipment Car Door Operator Equipment Door Operator: PMSSC
Controller Equipment	Controller: GAL Galaxy IV Controller Assembly Traction Cartop inspect station Limit Switches / Brackets / Cams
Cabling Equipment	Wedge Socket Springs Wedge Sockets Hoist Cable: 5/8" Steel Cable Governor Cable: 3/8" Steel Cable
Sling & Platform	Guides: ELPRO 816DS
Traction Equipment	Tension Weight: 191 Swing Type Car Sheaves Motor attached to gearbox Rope Gripper Machine Isolation Set Machine Beams Machine: Hollister-Whitney Geared Car Safety: 480 - Type B Flexible Car Governor
Counterweight Equipment	CWT Guides (4) Explosion Proof Switch (Governor)
Hoistway Equipment	Under Car Light (Nylube) Multi-Cable (18GA, 42 Wire) Electrical Package Travel Cable

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Schumacher

Project Milestones

Schumacher's Responsibility	Purchaser's Responsibility	Shared Responsibility

Agreement
A fully executed contract is required to commence work, ensuring a mutual understanding and commitment to project terms, timelines, and deliverables.

Survey
If needed, Schumacher conducts a site survey to confirm project specifications before moving forward.

Submittal
Engineering reviews project specifications and prepares detailed drawings.

Approval
Purchaser provides written approval that all submittal drawings are approved, allowing Schumacher to proceed with production and the purchase of long lead-time items.

Please note: Projects are not scheduled for production until Schumacher has received full approval.

Production
All necessary materials and components are manufactured and procured with the highest quality standards in preparation for a seamless installation.

Delivery
Prior to shipment, all jobsite absolutes must be met. Purchaser has 14 days to accept delivery of equipment upon completion of production (or storage fees may apply). Schumacher coordinates delivery to ensure all items arrive safely and on schedule.

Installation
Schumacher installs equipment, ensuring all components are assembled according to the approved plans and specifications. Installation is completed with attention to safety, quality, and efficiency.

Handoff
Final inspection and testing is completed, and the elevator system is officially handed off to Purchaser, signifying project completion and readiness for use.

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Schumacher

Obligations of Owner

The following work is the responsibility of the Owner, and at no cost to Schumacher Elevator Company. All work to be performed per the latest revision of the applicable national code and/or local code.

GENERAL WORK

a. Provide all cutting of walls, floors or partitions, together with all repairs made necessary by such cutting or changes;
b. Provide a staging and storage area close to the elevator hoistway;
c. Provide for removal of all spoils and debris accumulated during excavation from the lowest landing of the premises as required;
d. Both legal hoistway and machine room must be maintained at a temperature range 55°F - 85°F;
e. Provide proper support and install inserts provided by Schumacher Elevator Company as shown on G-1 print of the approved drawings;
f. Provide a legal machine room of adequate size, properly ventilated, lighted and heated per Elevator Code;
g. Provide routing for hydraulic and electrical lines;
h. Provide and install heat and smoke detectors as required;
i. Complete all this work in such time as not to delay work of Schumacher Elevator Company;
j. The price and installation schedule of Schumacher Elevator Company is based on these jobsite conditions existing at the beginning and during installation of the elevator equipment;
k. Complete all work prior to state inspection, if reinspection is required, the cost will be shared by the parties involved.
l. Provide a fire extinguisher in the machine room or in a location convenient to the machine space.
m. In accordance with code, if sprinklers are installed in hoistway, machine room, control space or machine space, provide means to automatically disconnect the main line power supply of the affected elevator and any other power supplies used to move the elevator upon the application of water is required (*Not applicable in the state of Minnesota*);

HOISTWAY & PIT WORK

n. Provide a legal hoistway of proper size with adequate pit depth, overhead height and be constructed to withstand forces and loads resulting from the use of the elevator;
o. Provide code compliant means to extract water from the pit;
p. Provide a hoisting beam as required at top of hoistway for digging and hoisting;
q. Provide all necessary sill supports;
r. Fill in around jack hole in pit, build in around door frames and grout under sills, as required by elevator contractor;
s. Provide all cutting of walls, floors or partitions, together with all repairs made necessary by such cutting or changes;
t. Provide all painting including hoistway doors and frames furnished with prime finish;
u. Provide means to guard and protect the hoistway during the time the elevator is being installed;
v. Provide sump pump and sump pit in elevator hoistway floor;

ELECTRICAL WORK

w. Electrical disconnects, one for three phase and several single-phase power supplies, with properly sized wires, as require by the manufacturer;
x. Provide standby power unit and means for starting it, that will deliver enough regulated power to the elevator disconnect switches to operate one or more elevators at a time at full-rated speed;
y. Provide electrical power to machine room and connect to controller terminals, with an intervening fused disconnect properly located in machine room, including shunt trip breakers, if required;
z. Provide a transfer switch for each feeder for switching from normal power to standby power and a contact on each transfer switch closed on normal power supply with two wires from this contact to one elevator controller;
aa. Provide means for absorbing power regenerated by the elevator system when running with overhauling loads such as full load down;
bb. Provide any required emergency power of adequate size to include switch gear and preconditioning signals, which may be required;
cc. Provide without charge, adequate power for excavation and tools during construction, starting, testing, and adjusting of equipment;
dd. Provide a separate 110-volt AC, 15-amp circuit fused disconnect terminated at controller;
ee. Provide GFI outlet and guarded light and switch;
ff. Provide means to guard and protect the hoistway during the time the elevator is being installed;
gg. When replacing an elevator controller, permanent hoistway lighting must provide 10 foot-candles at all points of the hoistway, measured with car top lights off. Install three-way switches at the pit and top landing access points. Refer to IAC 72.12(7) for complete requirements.
hh. ASME A17.1 2019 & IBC 2018 Code - Emergency Operation & Signaling Devices

For states that have adopted the ASME A17.1 2019 code or IBC 2018 the owner shall provide in addition to a dedicated analog phone line [1] an ethernet connection with internet access to the controller cabinet in the machine room. Per code, the ethernet connection is required to have 4-hour back-up power in the event power loss.

[1] Other options may be substituted such as cellular or VOIP. Please consult your local IT or telecom provider. This option still requires back-up power and must be communicated with your Schumacher Elevator Representative

*Fire control panel by others- per National Fire Alarm Code 6.15.3.2

The owner agrees to indemnify and hold harmless Schumacher Elevator Company against all claims, damages, losses, expenses, fines, and penalties, including but not limited to attorneys' and/or consultants fees, arising out of or resulting from the failure of the owner to carry out any obligations of the owner outlined in the foregoing agreement.

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Schumacher Contract Agreement

SEC003669-1 | VALID TO 4/25/2026

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That for consideration herein expressed, it is agreed by and between the parties as follows:

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SECTION 3 – GENERAL TERMS & CONDITIONS

1. Contract price is based on project receiving final engineering approval and being scheduled for production by 9/22/2026. If project has not received final engineering approval and been scheduled for production by 9/22/2026, the price shall be adjusted to reflect any increase in the cost of materials, including but not limited to the cost of major components and subcomponents purchased from third parties, and any increase in labor costs between the date of this contract and the date Supplier schedules the project for production after having final engineering approval. Purchaser shall execute a change order confirming the change in price upon receipt of documentation of the cost increases from Supplier.
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4. In the event Purchaser or Owner demands that Supplier stop work at the jobsite due to circumstances beyond the Supplier's control, a remobilization fee of $3,000 will be added to the contract price. A fully executed change order confirming Purchaser's agreement to pay the $3,000 remobilization fee is required for Supplier to return to the jobsite.
5. Supplier will complete the scope of work during regular working hours of 6:00 A.M. to 5:00 P.M. (not to exceed 8 hours per day for new construction and 10 hours per day for alteration of existing elevators and in either case not to exceed 40 hours in a work week) during regular working days of Monday to Friday, excluding holidays. Expedited work schedules can be arranged between the Supplier and the Purchaser with a fully executed change order specifying the additional compensation to be paid for the expedited work.
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7. Supplier will notify Purchaser in writing when the Project has been completed. Purchaser will complete Supplier's "Ready for Inspection" form. All checklist items on the form must be completed prior to scheduling the inspection. The inspection will occur within (10) business days of Supplier receiving confirmation that the checklist items have been completed, or at the authority having jurisdiction's earliest convenience. At conclusion of elevator inspection, Purchaser shall have an authorized representative execute the uniform "Acceptance for Use" form.
8. At the conclusion of the project, the Supplier will perform safety, full load, and fire service tests to ensure that each elevator conforms to all applicable codes.
9. Temporary use and construction use of the elevator is not permitted unless approved by Supplier in writing. If Supplier agrees to temporary use of the elevator, Purchaser will sign Supplier's "Acceptance for Temporary/Construction Use" form to authorize any temporary use. Temporary Use will be provided at a rate of $1,000 per month for a hydraulic elevator and at a rate of

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$1,350 per month for a traction elevator. Temporary use will not cause the warranty period for Supplier's installation services to commence. The warranty period for Supplier's installation services will not commence until there is an executed "Acceptance for Use" form. Purchaser will be responsible to pay for replacement materials that are due to vandalism, damage, or misuse during the temporary use timeframe.

10. Elevator "runtime" is not included in this Agreement. If runtime is requested by Purchaser and provided by Supplier, Purchaser will be billed for runtime at the rate of $250/hour for runtime provided during normal business hours, and the rate of $285/hour for runtime provided on overtime. Purchaser will sign an "Authorization for Runtime" form prior to the Supplier performing any runtime.
11. All work performed outside of the scope of this Agreement will be billed to Purchaser at a single worker rate of $250 per man hour for regular time (6am to 5 pm) and $420 per man hour for overtime (after 5pm and before 6am or over 8 hours per day or 40 hours in a workweek), plus any expenses. A team hour (a mechanic and an apprentice) will be billed at a rate of $450 per hour for regular time and $750 per hour for overtime, plus any expenses. Purchaser must enter into a change order describing the additional work and confirming the applicable rate before Supplier is required to perform work outside the scope of this Agreement.
12. Supplier will provide the following electronic closeout documents: standard owner's information manual, standard final as built drawings, and Supplier's standard warranty. One paper copy of the closeout documents will be provided at the Purchaser's request. Additional paper copies are available at $350 per set.
13. The terms of this Agreement shall not be supplemented or amended by Purchaser's bid documents or a contract provided by Purchaser. This Agreement sets forth the entire agreement between the parties. If the Purchaser accepts the terms of this Agreement by issuing a purchase order, Supplier shall not be bound by any of the terms in the purchase order, and none of the terms in the purchase order shall have the affect of amending, modifying or nullifying any of the terms of this Agreement. In the event of a conflict between the terms of Purchaser's purchase order and this Agreement, the terms of this Agreement shall govern the contractual relationship between Supplier and Purchaser.
14. Neither party shall be liable to the other party hereunder for special, indirect, consequential, exemplary or incidental damages.
15. Supplier will secure and maintain minimum insurance coverage to protect against claims for bodily injury or death, or for damage to property, which may arise out of the operations by the Supplier or by anyone employed by them. Certificates of Workers' Compensation, Employer's Liability, and Commercial General Liability, Commercial Automobile Liability, and Umbrella/Excess Liability will be furnished to the Purchaser upon request.
16. If Purchaser terminates or cancels this Agreement, Purchaser shall be liable for all costs incurred by Supplier through the date of Supplier's receipt of Purchaser's written notice of cancellation. Purchaser agrees to pay any cancellation fees within ten (10) days of the cancellation date.

SECTION 4 – PAYMENT TERMS

Milestone	Description	Percentage	Timing
Down Payment	Reserves spot on master schedule, begins submittal, engineering, and procurement process	25%	Billed upon execution of contract. Payment due Net 30 days.
Progress Billings	Storage and delivery of material, mobilization, field installation	Percentage of Completion	Billed monthly by the 20th of the month; for work completed through the end of the current month. Payment due Net 30 days.

- All change orders must be executed prior to the performance of the work described in the change order. However, if Purchaser instructs or directs Supplier to provide work outside the scope of this Agreement and the work is performed by Supplier without first obtaining a change order, then the change order must be signed by Purchaser prior to Supplier having an obligation to schedule the final inspection.
- If final payment is not made within 30 days of the final progress billing, the Supplier shall be relieved of the obligation to honor its warranty and any obligations to provide the warranty maintenance.
- Purchaser agrees to pay interest at the rate of 1.5% per month or 18% APR on all past due account balances.
- Purchaser agrees to pay all collection costs incurred to collect past due account balances. Collection costs include all reasonable attorney fees, collection agency fees, court costs, and litigation expenses.
- Purchaser agrees that should legal action become necessary to enforce collection of past due account balances, jurisdiction and venue shall be in the Iowa district court in Bremer County, Iowa.
- Any tax or other governmental charge imposed upon the sale of the goods shall be paid by Purchaser, and Purchaser's failure to pay any applicable tax shall be a breach of this entire agreement.

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SECTION 5 – WARRANTY

There are two components to Supplier's warranty. Supplier warrants and guarantees it shall perform its labor in a skillful manner. Supplier also provides a limited warranty regarding the products manufactured by Supplier.

Supplier's labor (workmanship) is guaranteed for a period of (1) year from the date of the executed "Acceptance for Use" form for each elevator. The workmanship warranty excludes ordinary wear and tear, improper use, vandalism, abuse, misuse, neglect, or any other causes beyond Supplier's control. This express limited warranty with respect to workmanship is in lieu of all other warranties, express or implied, including any warranties of merchantability or fitness for a specific purpose.

The terms of Supplier's limited warranty with respect to products manufactured by Supplier are set forth in the "Standard Warranty-Packages & Components" attached as Exhibit A.

SECTION 6 – INDEMNIFICATION

Supplier shall indemnify and hold Purchaser harmless from and against all claims, damages, losses, and expenses arising out of or resulting from any negligent act or omission of Supplier, Supplier's Contractors, or anyone directly or indirectly employed by Supplier or Supplier's Contractors. Supplier shall not be obligated to indemnify or hold Purchaser harmless for any claims, damages, losses, and expenses arising out of or caused in whole or in part by any act or omission of Purchaser, Purchaser's other contractors and Contractors, or anyone directly or indirectly employed by or supervised by Purchaser or Purchaser's other contractors or Contractors.

SECTION 7 – RISK OF LOSS

Risk of loss shall pass to Purchaser as soon as the materials and equipment are delivered to the Purchaser. Purchaser shall pay all costs of insurance from the time that risk of loss passes to Purchaser.

SECTION 8 – FORCE MAJEURE

Supplier shall not be responsible for any delivery or failure to make delivery of all or any part of the goods purchased under this agreement due to federal, state, or municipal action, statute, ordinance, or regulation, strike or other labor trouble, acts of God or natural disasters, riot or other civil disturbance, inability to secure raw materials or supplies, or, without limiting the foregoing, by any other cause, contingency, or circumstance within or without the United States not subject to Supplier's control which prevents or hinders the manufacture or delivery of the goods sold hereunder. The provisions of this paragraph shall not be limited by any provision in which time is made of the essence.

SECTION 9 – ACCEPTANCE

Your signature below signifies acceptance of this contract agreement. A binding contract agreement is required to commence work.

Schumacher

Contract Agreement

Purchaser		Supplier	
Purchaser:	City of Waterloo, Iowa	Supplier:	Schumacher Elevator
Signature:	Dave Boesen 393E8397B3D3421...	Signature:	
Name:	Dave Boesen	Name:	Owen Teeling
Title:	Mayor	Title:	Sales Manager
Date:	Approved by council on 11/3/2025.	Date:	4/15/2026
Do you need to issue a purchase order?		P.O. Number:	

DocuSign Envelope ID: 1AA01DEC-30A7-41BA-8486-C42A664085C3

Prepared by LeAnn M. Even, Deputy City Clerk, City of Waterloo, 715 Mulberry Street, Waterloo, IA 50703, (319) 291-4323.

RESOLUTION NO. 2025-641

RESOLUTION APPROVING A PROFESSIONAL SERVICES CONTRACT WITH SCHUMACHER ELEVATOR FOR THE REPLACEMENT OF THE WATERLOO PUBLIC LIBRARY ELEVATOR IN THE AMOUNT OF $275,301.00 AND AUTHORIZING THE MAYOR TO EXECUTE SAID DOCUMENT.

WHEREAS the Waterloo Public Library requires replacement of an existing elevator to ensure safe, reliable, and ADA-compliant access for patrons and staff; and

WHEREAS, City staff has negotiated a Professional Services Contract with Schumacher Elevator Company to provide elevator replacement services, including equipment, installation, testing, and commissioning; and

WHEREAS, the total contract amount is $275,301.00, and City staff has determined the proposed contract is in the best interests of the City and compliant with applicable City purchasing policies and Iowa law.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Waterloo, Iowa, that:

1. The Professional Services Contract with Schumacher Elevator Company for the Waterloo Public Library elevator replacement project, in the amount of $275,301.00, is hereby approved.

2. The Mayor is authorized and directed to execute said documents on behalf of the City of Waterloo, Iowa.

PASSED AND ADOPTED this 3rd day of November 2025.

DocuSigned by:
Quentin Hart
D0525D78AAC8449...
Quentin Hart, Mayor

ATTEST:

Signed by:
Kelley Felchle
FF60BC0FFBC64AB...
Kelley Felchle, City Clerk

SEAL



Docusign Envelope ID: F8ABB82D-E890-419C-8A16-12B409DE9576

Schumacher

Exhibit A

STANDARD WARRANTY – PACKAGES & COMPONENTS

Schumacher Elevator Company warrants all manufactured products to be free of defects in material and workmanship under normal and intended use conditions for a period of 1 year from the date of shipment from our factory.

During the term of the warranty, Schumacher Elevator Company will replace any product manufactured by Schumacher Elevator Company which is confirmed to be defective in material and/or workmanship by inspection at our factory. This warranty excludes ordinary wear and tear, improper installation by others, improper use, vandalism, abuse, misuse, neglect, or any other causes beyond the control of Schumacher Elevator Company.

This warranty is voided if products are improperly exposed to the elements. The warranty is also voided if the manufactured products are altered or modified in any manner, including modifications or alterations to the circuitry.

This warranty is also voided if improper wiring methods are used during installation of the manufactured products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A SPECIFIC PURPOSE.

Schumacher Elevator Company will not be liable for any contingent or consequential costs such as the cost of installation of replacement or repaired products, travel expense, or any other expense incurred in connection with the replacement or repair.

Schumacher Elevator Company will not be liable for loss of profits, or any other indirect, consequential, or incidental damages.

Products not manufactured by Schumacher Elevator Company are not covered by this warranty. If Schumacher Elevator Company has purchased products from another manufacturer and resold such products to the Purchaser, the standard warranty provided by the third-party manufacturer, if any, will apply. The Purchaser is encouraged to refer to the description of warranty terms offered by third-party manufacturers in their respective O&M Manual.

This warranty replaces and supersedes any and all previous warranties offered by Schumacher Elevator Company.

WARRANTY EXCHANGE – PACKAGES & COMPONENTS

To begin the warranty exchange process, the Purchaser should contact our inventory department to request trouble shooting assistance and to obtain a Return Material Authorization (RMA) number. If Schumacher Elevator Company determines that an exchange is necessary, the replacement product will be sent via the appropriate shipping method along with the RMA number.

The Purchaser will be responsible for the cost of shipping the product in question, freight prepaid, with the RMA number included, to our factory for evaluation within thirty (30) days of the RMA being issued.

If the product in question is not shipped to Schumacher Elevator within 30 days of Purchaser's receipt of the replacement product, the Purchaser will be invoiced the full purchase price of the replacement product. No credit will be offered if the product in question is not returned within 30 days. Upon receipt of the product in question, Schumacher Elevator will perform a full evaluation to determine whether the product has any defects in material or workmanship not caused by exclusions to Schumacher Elevator Company's warranty. If the evaluation determines that there are no defects in material or workmanship or existing defects are the result of a warranty exclusion, the Purchaser will be invoiced the full purchase price of the replacement product.

When returning products to Schumacher Elevator Company, the Purchaser is encouraged to use a trackable shipping method. Schumacher Elevator Company is not responsible for products lost, stolen or damaged in the course of shipping the products to Schumacher Elevator Company.

Schumacher ELEVATOR

Contact Information

Jobsite Information

Jobsite Name:	WATERLOO PUBLIC LIBRARY				
Address:	415 COMMERCIAL ST				
City:	WATERLOO	State:	IA	ZIP:	50703
Contact Name:	Ed Abben	Title / Role:	Maintenance Forman		
Phone:	319-269-4688	Email:	Ed.abben@waterloo-ia.org		

Billing Information

Company Name:	CITY OF WATERLOO				
Address:	715 MULBERRY ST				
City:	WATERLOO	State:	IA	ZIP:	50703
Contact Name:	Greg Ahlhlem	Title / Role:	Building Maintenance		
Phone:	319-291-4319	Email:	greg.ahlhelm@waterloo-ia.org		

Owner Information

Same as Billing:

Company Name	CITY OF WATERLOO IA				
Address:	715 MULBERRY ST.				
City:	WATERLOO	State:	IA	ZIP:	50703
Contact Name:	ED ABBEN	Title / Role:	MAINTENANCE FOREMAN		
Phone:	319-269-4688	Email:	ed.abben@waterloo-ia.org		

Submittal Information

Company Name:	CITY OF WATERLOO				
Address:	715 MULBERRY ST.				
City:	WATERLOO	State:	IA	ZIP:	50703
Contact Name:	GREG AHLHELM	Title / Role:	MAINTENANCE SUPERVISOR		
Phone:	319-291-4913	Email:	greg.ahlhelm@waterloo-ia.org		

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/2/2026

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Holmes Murphy & Associates
2727 Grand Prairie Parkway
Waukee IA 50263

CONTACT NAME: Jaden Buchanan
PHONE (A/C, No, Ext): 515-706-5413 **FAX (A/C, No):**
E-MAIL ADDRESS: jbuchanan@holmesmurphy.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Zurich American Insurance Company	16535
INSURER B : Arch Specialty Insurance Company	21199
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED SCHELEPC1
Schumacher Elevator Company
One Schumacher Way
P.O. Box 393
Denver IA 50622

COVERAGES **CERTIFICATE NUMBER:** 1653902419 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY	Y	Y	GLO3757132	11/1/2025	11/1/2026	EACH OCCURRENCE	$ 2,000,000
	[ ] CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 500,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 4,000,000
	[ ] POLICY [X] PRO-JECT [X] LOC						PRODUCTS - COMP/OP AGG	$ 4,000,000
	[ ] OTHER:							$
A	AUTOMOBILE LIABILITY			BAP3757133	11/1/2025	11/1/2026	COMBINED SINGLE LIMIT (Ea accident)	$ 2,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	[ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
B	[ ] UMBRELLA LIAB X OCCUR			UXP103441406	11/1/2025	11/1/2026	EACH OCCURRENCE	$ 5,000,000
	X EXCESS LIAB [ ] CLAIMS-MADE						AGGREGATE	$ 5,000,000
	[ ] DED [ ] RETENTION $							$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N			WC3757131	11/1/2025	11/1/2026	X PER STATUTE [ ] OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [N] N/A						E.L. EACH ACCIDENT	$ 1,000,000
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
RE: Waterloo Public Library - 915 Commercial St. Waterloo IA 50703
City of Waterloo is an Additional Insured on General Liability as required by written contract with the insured, per policy terms and conditions. The General Liability includes a Waiver of Subrogation in favor of additional insureds as required by written contract with the insured, per policy terms and conditions.

CERTIFICATE HOLDER
City of Waterloo
715 Mulberry Street
Waterloo IA 50703

CANCELLATION
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
Kari Cooley

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COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT
Brian Baker, Interim Building Official
Building Department

MEETING DATE
September 8, 2026

AGENDA ITEM TITLE
Resolution approving the sale of all contents of the former Courier Building, 100 E. 4th Street, Waterloo, Iowa, including desks, chairs, shelving, tables, etc. as requested by the Building Maintenance Department.

RECOMMENDED COUNCIL ACTION
Approval

SUMMARY STATEMENT AND BACKGROUND INFORMATION

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS
None

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Randy Bennett, Public Works Division Manager
Public Works Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution approving a Contract with Midwest Cleaning Pros of Waverly, Iowa, in the amount of $82,092.00 annually, in conjunction with the cleaning of the Public Works Facility, and authorizing the Public Works Division Manager to execute said document.

RECOMMENDED COUNCIL ACTION

Approve contract.

SUMMARY STATEMENT AND BACKGROUND INFORMATION

Midwest Cleaning Pros provided lowest bid for cleaning services of the Public Works Facility including cleaning of garage bay and office space.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

Operating budget.

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Midwest contract

ESTIMATE

Midwest Cleaning Pros LLC
1527 Garden Ave
Waverly, IA 50677-9124

info@midwestcleaningpros.com
+1 (319) 883-4760
midwestcleaningpros.com

Sheila Steffen
Bill to
City of Waterloo Public Works

Estimate details
Estimate no.: 1045
Estimate date: 06/18/2026

#	Service Date	Product/service	Description	Qty	Rate	Amount
1.		**Daily Cleaning Service**	Daily Janitorial Service – Public Works Facility This proposal includes daily janitorial services for the Public Works facility at the monthly rate listed below. Services will be performed by a team of 3 cleaning professionals, averaging 3 hours per shift. A structured daily, weekly, and monthly cleaning schedule will be implemented to ensure all areas are maintained to a high standard while maximizing efficiency and consistency. Please refer to the Scope of Work section for a detailed breakdown of services provided.	1	$6,841.00	$6,841.00
2.		**Window Cleaning**	Annual window cleaning on office windows. (Included in price)	1	$0.00	$0.00
3.		**Floor Care Services**	Annual hard scrubbing of floors with our floor machine. (Included in price)	1	$0.00	$0.00
				Total		$6,841.00

Accepted date

Accepted by

$6841 x 12 mos = $82,092 Annually

Scope of Services

Daily Janitorial Cleaning Services

Location: City of Waterloo Public Works
Address: 625 Glenwood St, Waterloo, IA 50703

Midwest Cleaning Pros will provide standard daily janitorial cleaning services for the facility. Services are based on routine maintenance cleaning and are intended to keep offices, restrooms, breakrooms, common areas, entrances, and accessible work areas clean and presentable.

Service Schedule

Cleaning services will be performed **Monday through Friday**, unless otherwise agreed upon in writing.

This scope is based on **three to four cleaning technicians working approximately 3 hours per visit**, for a total of approximately **9 labor hours per service day**.

General Cleaning Services

Services will include the following standard janitorial tasks:

Trash Removal

All regular office, restroom, breakroom, and common-area trash will be collected and removed to the designated disposal area. Trash can liners will be replaced as needed.

Restroom Cleaning

Restrooms will be cleaned and sanitized, including toilets, urinals, sinks, counters, partitions, mirrors, dispensers, and other touchpoints. Floors will be swept and mopped. Restroom supplies will be restocked as available.

Vacuuming

Carpeted office areas, entry mats, and other applicable carpeted spaces will be vacuumed as needed to maintain a clean appearance.

Sweeping and Mopping

Hard-surface floors in restrooms, breakrooms, common areas, entryways, hallways, and other agreed-upon areas will be swept and mopped as part of the routine cleaning service. We will provide a quarterly scrubbing of floors on a routine basis.

Surface Wiping

Tables, counters, desks, ledges, and other accessible surfaces will be wiped down as needed. Cleaning will be limited to accessible surfaces and will not include moving large items, personal belongings, paperwork, tools, equipment, or sensitive materials.

Glass Cleaning

Interior entry glass, door glass, and accessible interior glass surfaces will be spot cleaned to remove fingerprints, smudges, and visible marks. Exterior window washing is not included unless listed separately.

Breakroom and Common Areas

Breakroom tables, counters, sinks, exterior surfaces of appliances, and common-area touchpoints will be wiped down. Floors will be swept and mopped or vacuumed as applicable.

High-Touch Points

Common touchpoints such as door handles, light switches, handrails, counters, and shared surfaces will be wiped down as part of the routine cleaning service.

Notes and Exclusions

This scope includes standard daily janitorial maintenance cleaning only. The following services are not included unless quoted separately:

Post-construction cleaning, pressure washing, industrial equipment cleaning, biohazard cleanup, or removal of excessive debris.

Midwest Cleaning Pros will perform cleaning in accessible areas only and will not move personal items, tools, equipment, paperwork, chemicals, or sensitive materials.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT	MEETING DATE
Noel Anderson, Community Planning and Development Director Planning & Zoning Department	September 8, 2026

AGENDA ITEM TITLE

Resolution approving a Temporary Easement Agreement in the amount of $2,269.00 with NNDYM WLK, Inc., located at 1945 La Porte Road, in conjunction with the La Porte Road Phase III Reconstruction Project, and authorizing the Mayor and City Clerk to execute said document.

RECOMMENDED COUNCIL ACTION

Approval.

SUMMARY STATEMENT AND BACKGROUND INFORMATION

Transmitted is a resolution approving a temporary easement agreement in the amount of $2,269.00 with NNDYM WLK, Inc., located at 1945 La Porte Road, in conjunction with the La Porte Road Phase III Reconstruction Project, and authorizing the Mayor and City Clerk to execute said document. The temporary easement is intended for the reconstruction of La Porte Road, utility improvements, grading, reseeding and installation of a recreational trail. The offer price was valued at 120 percent of the assessed value of the land. 1945 La Porte Road has a value of $10.11 per square foot, and only ten percent of the full asking price ($22,690.00) is offered for the temporary easement since it will expire.

NEIGHBORHOOD IMPACT

Reconstruction of the corridor would have a positive impact upon the surrounding commercial area, as the corridor was designed and built in the1960s. The redesigned corridor will have underground utilities and streetscaping.

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

Property owners along the corridor have been invited to multiple public information meetings.

SOURCE OF EXPENDITURES

Crossroads TIF

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Temporary Easement Agreement

Prepared by Tim Andera, City of Waterloo, 715 Mulberry Street, Waterloo, IA 50703 Phone (319) 291-4366

TEMPORARY EASEMENT AGREEMENT

This Temporary Easement Agreement (the "Agreement") is entered into as of _____, 2026 by and between the City of Waterloo, Iowa ("Grantee") and NNDYM WLK, INC. ("Grantor").

1. **Grant of Temporary Easement.** In consideration of the mutual promises and covenants contained herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged Grantor does hereby grant and convey unto Grantee, and Grantee does hereby accept, a temporary easement for purposes relating to construction of the Improvements (the "**Temporary Easement**") in, to, upon, over, across, and beneath the real estate (the "**Temporary Easement Premises**") as set forth on Exhibit "A" attached hereto and by this reference made a part hereof.

2. **Purpose.** The Temporary Easement Premises is intended for use by Grantee, its employees, contractors and agents, for Phase III reconstruction of La Porte Road, and utility improvements, grading, seeding, and installation of sidewalk. (the "**Improvements**"). Following completion of Grantee's work in the Premises, Grantee shall restore the Premises to its condition prior to the commencement of construction work, including but not limited to reseeding any grassed areas disturbed by construction activities, and Grantor shall be responsible for watering any reseeded areas. It is the intention of the parties that Grantee shall assume all responsibility for the construction of the Improvements adjacent to the Premises, and that Grantor shall have no liability relating to the Easement or the Improvements except as may arise from the Grantor's own negligent acts or omissions or willful misconduct. The Agreement will be in place until the acceptance of the project.

3. **Grantor Duties and Privileges.** Grantor shall deliver possession of the Temporary Easement Premises to Grantee, "as is, where is", without any representation or warranty as to the condition of same. Grantor shall have no duty to prepare the Temporary Easement Premises in any way for Grantee's use. Following transfer of possession of the Temporary Easement Premises, Grantor shall have no further duty or obligation with respect to same, except as set forth herein. Grantor may mow or care for grasses and vegetation growing in the Temporary Easement Premises during the period of this Agreement but may not conduct other activities upon the Temporary Easement Premises without the prior written consent of Grantee. Grantor agrees that any activities that Grantor, its officers, employees, contractors or agents undertake on the Temporary Easement Premises during the term hereof shall be at their sole risk, and Grantor hereby agrees to indemnify Grantee, its officials, officers, employees, contractors and agents,

with respect to any and all claims for injuries, death, property damage, property loss or otherwise, arising from the acts or omissions of Grantor, its officers, employees, contractors or agents, on or about the Temporary Easement Premises during the term of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Temporary Easement Agreement by their duly authorized representatives as of the date first set forth above.

NNDYM WLK, INC.

By: CHAUDHARI ANIL

Printed Name:

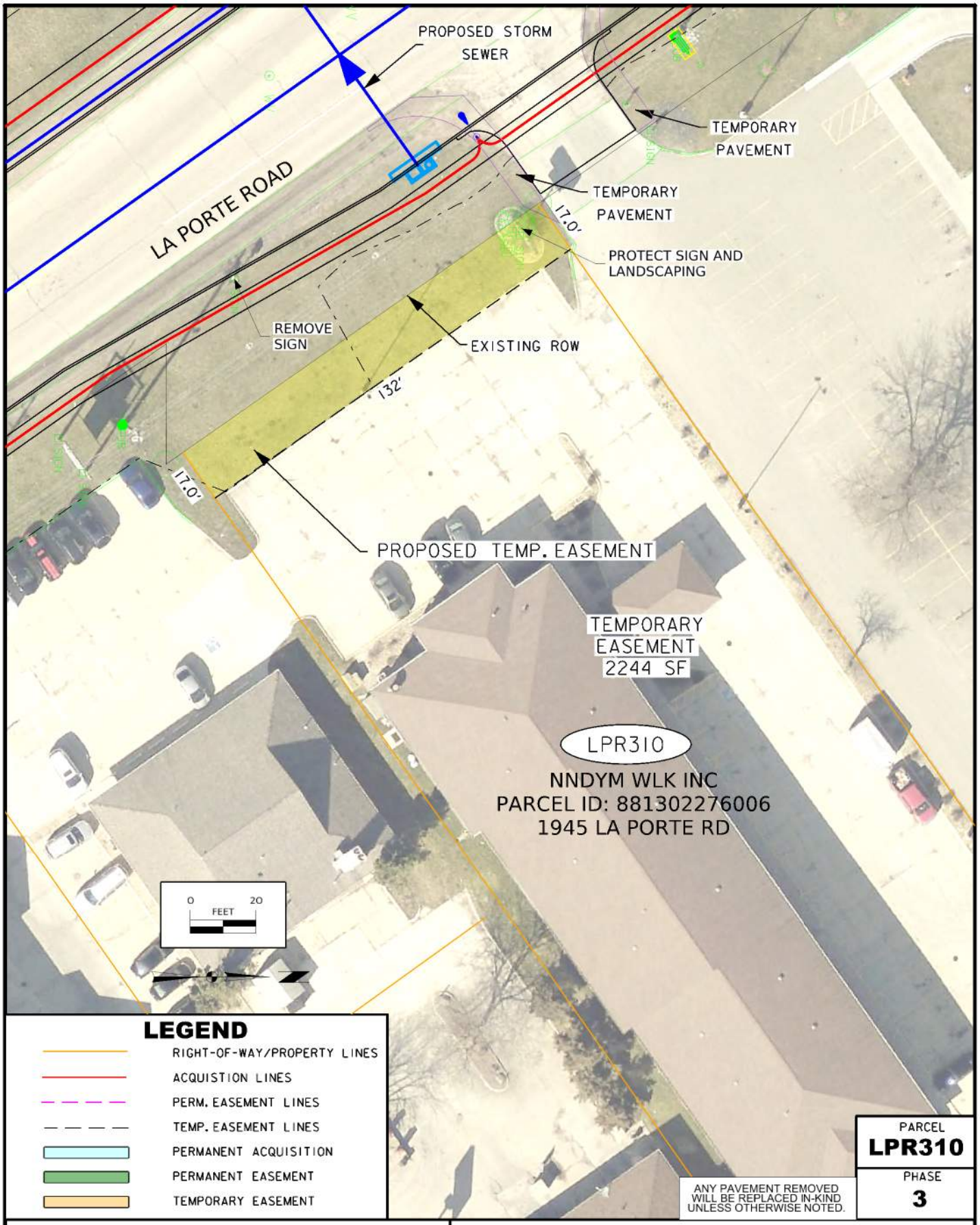
Title: OWNER/PRESIDENT



CITY OF WATERLOO, IOWA

By: _____
David Boesen, Mayor

Attest: _____
Kelley Felchle, City Clerk



AECOM

Public Impact Diagram
NNDYM WLK INC
La Porte Road Reconstruction

01-09-26 Waterloo, Iowa 60736162

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Noel Anderson, Community Planning and Development Director
Planning & Zoning Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution approving a Development and Minimum Assessment Agreement with Kel Mar, LC, for the construction of a new 60,000 square-foot warehouse building with a tax rebate schedule of one year at seventy-five percent, one year at seventy percent, and eleven years at fifty percent, with a Minimum Assessment Agreement of $3,030,000.00, for property located south of 1575 W. Big Rock Road, and authorizing the Mayor and City Clerk to execute said documents.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

The City of Waterloo is proposing to enter into a Development Agreement with Kel-Mar LC for a 60,000 square foot warehouse expansion to Core Plastech at 1575 W Big Rock Rd. The Company has purchased the property to the south and will build a 60,000 square foot warehouse onto their business. The City of Waterloo will provide 1 year of rebates at 75%, an additional year at 70%, and an additional 11 years at 50% for a total of 13 years of rebates, in accordance with the City's policy. The Minimum Assessed Value for the expansion site will be $3,030,000.00 and rebates will be given for any value over the base value of $50,971.00.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

East Waterloo Unified TIF Funds.

ALTERNATIVE ACTION

LEGAL DESCRIPTION

Parcel D of the Plat of Survey recorded as Document No. 2026-07293 in the Office of the Black Hawk County Recorder, Black Hawk County, Iowa.

ATTACHMENTS

1. Signed Development Agreement Kel-Mar
2. 2026_0707 - Wtrl KelMar - ConceptRev4

Prepared By: Austin J. McMahon, Lange & McMahon, PLC, 222 1st St. E., Independence, IA (319) 334-4488

DEVELOPMENT AGREEMENT

This Development Agreement (the "Agreement") is entered into as of this _____ day of _____ 202__, by and between KEL-MAR, L.C (the "Company") and the City of Waterloo, Iowa (the "City").

RECITALS

A. In furtherance of the objectives of Chapter 403 of the Code of Iowa, as amended (the "Urban Renewal Act"), City is engaged in carrying out urban renewal project activities in an area known as the East Waterloo Unified Urban Renewal and Redevelopment Plan Area ("Urban Renewal Area").

B. Company is willing and able to finance development and improvements on the real property shown in Exhibit A (the "Property"), which is located in the Urban Renewal Area.

C. City considers economic development within the City a benefit to the community and is willing for the overall good and welfare of the community to provide financial incentives so as to encourage that goal, and the City further believes that the project is in the vital and best interests of the City and that the project and such incentives are in accordance with the public purposes and provisions of applicable State and local laws and requirements under which the project has been undertaken and is being assisted.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, the parties agree as follows:

1. **Improvements by Company.** Company shall develop or construct a 60,000 square foot industrial building and incidental infrastructure or features, such as landscaping, water detention, paving, signage, and parking, on the Property in accordance with this Agreement, including but not limited to, Section 3 (collectively referred to as the "Improvements" or "Project"). Company agrees that the Improvements shall be constructed in accordance with the terms of this Agreement, the urban renewal plan applicable to the Property, and all applicable City, state, and federal building codes and shall comply with all applicable City ordinances and other applicable law. City may require that Company submit specific building designs and site plans for City's review and reasonable approval. Company will use its best efforts to obtain, or cause to be obtained, in a timely manner, all required permits, licenses and approvals, and will meet, in a timely manner, all requirements of all applicable local, state, and federal laws and regulations which must be obtained or met before the Improvements may be lawfully constructed, including but not limited to final permit inspections. The Property, the Improvements, and all site preparation and development-related work to make any of the Property usable for Company's purposes as contemplated by this Agreement are collectively referred to as the "Project."

2. **Construction Plans.** Company agrees that it will cause the Improvements to be constructed on the Property in conformance with construction plans (the "Plans") that have been submitted to and approved by the City, including in conformance with the Master Plan that is appended to this Agreement as Exhibit C. Company agrees that the scope and scale of the Improvements to be constructed shall not be significantly less than the scope and scale of such improvements as detailed and outlined in the Plans.

If any material modification in the scope, scale or nature of the Plans is proposed, Company shall submit modified Plans (the "Modified Plans") to the City for review. Modified Plans shall be subject to approval by the City as provided in this Section. City shall approve the modified Plans in writing if: (a) the Modified Plans conform to the terms and conditions of this Agreement; (b) the Modified Plans conform to the terms and conditions of the urban renewal plan; (c) the Modified Plans conform to all applicable federal, state and local laws, ordinances, rules and regulations and City permit and design review requirements; (d) the Modified Plans are adequate for purposes of this Agreement to provide construction to provide for the construction of the Improvements, and (e) no Event of Default under the terms of this Agreement has occurred; provided, however, that any such approval of the Plans or Modified Plans pursuant to this Section shall constitute approval for the purposes of this Agreement only and shall not be deemed to constitute approval or waiver by the City with respect to any building, fire, zoning or other ordinances or regulations of the City, and shall not be deemed to be sufficient plans to serve as the basis for the issuance of a building permit if the Plans or Modified Plans are not as detailed or complete as the plans otherwise required for the issuance of a building permit.

The Plans or Modified Plans must be rejected in writing by City within thirty (30) days

of submission or shall be deemed to have been approved by the City. If City rejects the Plans or Modified Plans in whole or in part, Company shall submit new or corrected Plans or Modified Plans within thirty (30) days after receipt by Company of written notification of the rejection, accomplished by a written statement of the City specifying the respects in which Company's Plans or Modified Plans fail to conform to the requirements of this Section. The provisions of this Section relating to approval, rejection and resubmission of corrected Plans or Modified Plans shall continue to apply until they have been approved by the City, provided, however, that in any event Company shall submit Plans or Modified Plans which are approved by City prior to commencement of construction of additional or modified Improvements.

Approval of the Plans or Modified Plans by the City shall not relieve Company of any obligation to comply with the terms and provisions of this Agreement, or the provision of applicable federal, state and local laws, ordinances and regulations, nor shall approval of the Plans or Modified Plans by City be deemed to constitute a waiver of any Event of Default. Approval of Plans or Modified Plans hereunder is solely for purposes of this Agreement and shall not constitute approval for any other City purpose nor subject the City to any liability for the Improvements as constructed.

3. **Timeliness of Construction; Possibility of Termination.** The parties agree that Company's commitment to undertake the Project and to construct the Improvements in a timely manner constitutes a material inducement for the City to enter into this Agreement and that without said commitment City would not do so.

A. Deadlines to Commence and Complete. Company must obtain all required permits or licenses and begin development or construction of the Improvements within six (6) months from the date of this Agreement (the "Commencement Date"). Company must Substantially Complete development or construction within fourteen (14) months from the date of this Agreement (the "Completion Deadline"). For purposes of this Agreement, "Substantially Completed" means the date on which the Improvements have been completed to the extent necessary for the City to issue a certificate of occupancy relating thereto and the City has verified that any Project element for which no permit was necessary has been Substantially Completed. All deadlines are subject to Unavoidable Delays as described below. The City's Community Planning and Development Director may, but shall not be required to, consent to an extension of time of up to six (6) months for the construction of the Improvements. Any additional or longer extensions will require approval and consent of the City Council.

B. Events Triggering Termination. If Company does commence or does not Substantially Complete development or construction of the Improvements in accordance with the deadlines stated above, then, subject to Unavoidable Delays, then City may terminate this Agreement as set forth in Section 17, and City shall then have no further obligation to Company under this Agreement. If development has commenced within the required period, as the same may be extended, and is subsequently stopped or delayed as a result of extreme weather such as ice, ground freezing, and other conditions that restrict construction, as well as an Act of God, war, civil disturbance, court order, labor dispute, fire, pandemic, governmental mandates (local, state or federal), delays in City approvals, or other cause beyond

the reasonable control of Company (each an "Unavoidable Delay"), the requirement that construction be completed by the Completion Deadline shall be tolled for a period of time equal to the period of Unavoidable Delay. If City terminates this Agreement, City shall have no further obligations to Company under this Agreement, including but not limited to, any legal or equitable obligation to reimburse Company for any costs expended by Company with respect to the Project or to compensate Company for any value added to the Property by any Improvements. In connection with termination of the Agreement as set forth herein, City may demand reimbursement of any sums paid to or for the benefit of Company in connection with the Project, in addition to exercising any other available remedies.

4. **No Encumbrances; Limited Exception.** Until the Improvements are Substantially Completed, Company agrees that it shall not create, incur, or suffer to exist any Liens on the Property, other than such mortgage or mortgages as may be reasonably necessary to finance Company's completion of the Improvements *and* of which Company notifies City *before* Company executes any such mortgage. Company may not mortgage the Property or any part thereof for any purpose except in connection with financing of the Improvements.

5. **Utilities.** Company will be responsible for extending water, sewer, telephone, telecommunications, electricity, gas and other utility services to any location on the Property. Company will be responsible for payment of any associated connection fees other than water connection fees, which will be paid by City.

6. **Minimum Assessment Agreement.** Company acknowledges and agrees that it will pay when due all taxes and assessments, general or special, and all other charges whatsoever levied upon or assessed or placed against the Property. Company further agrees that prior to the date set forth in Section 2 of the Minimum Assessment Agreement (the '"MAA"') attached hereto as Exhibit "B"' it will not seek or cause a reduction in the taxable value for the Property as improved pursuant to this Agreement, which shall be fixed for assessment purposes, below the amount of $3,030,000.00 (the "Minimum assessed value"), through:

(a) Willful destruction of the Property, the Improvements, or any part of either;

(b) a request to the Assessor of Black Hawk County; or

(c) any proceedings, whether legal, or equitable, with any administrative body or court within the City, Black Hawk County, the State of Iowa, or the federal government.

Company agrees to execute and deliver the MAA concurrently with its execution and delivery of this Agreement.

7. **Tax Rebates.** Provided that Company has completed Substantially Completed the Improvements before the Completion Deadline, and subject to the other terms of this Agreement, including any extensions for Substantial Completion, City agrees to rebate property tax (with the exceptions noted below) with respect to the Improvements, as follows:

Year One: 75% rebate
Year Two: 70% rebate
Year Three through Year Thirteen: 50% rebate each year

for any taxable value added by the completed Improvements (each such payment is a "Rebate") over the initial base value of $ 50,971.00. Each Rebate is payable in respect of a given property tax fiscal year (a "Fiscal Year") only to the extent that (a) Company has actually paid general property taxes due and owing for such Fiscal Year and (b) the city council has made an appropriation for the payment of the Rebate. To receive a Rebate for a given Fiscal Year, Company must, within twelve (12) months after the due date of the last installment of the property taxes for the respective Fiscal Year (i.e., the "March Installment"), submit a completed Rebate request to City on the form provided by or otherwise satisfactory to City. A failure to timely submit a request for a Rebate for a Fiscal Year will result in a forfeiture of the right to request a Rebate for such Fiscal Year. City agrees to consider a completed application for a Rebate within sixty (60) days after submission of the application to City.

The taxable value of the Property as a result of the Improvements must be increased by a minimum of 10% and must increase the annual tax by a minimum of $500.00. Rebates shall not be paid based on any special assessment levy, debt service levy, or any other levy that is exempted from treatment as tax increment financing under the provisions of applicable law. The first Fiscal Year in respect of which a Rebate may be given ("Year One") shall be the first full Fiscal Year for which the assessment is based upon the completed value of the Improvements and not based on a prior Fiscal Year for which the assessment is based solely upon (x) the value of the Property, or upon (y) the value of the Property and a partial value of the Improvements due to partial completion of such Improvements or a partial Fiscal Year.

8. **Limitations on Payment of Rebates.**

A. Each payment of a Rebate is subject to annual appropriation by the city council each fiscal year. City has no obligation to make any payments to Company as contemplated under this Agreement until the city council annually appropriates the funds necessary to make such payments. The right of non-appropriation reserved to City in this paragraph is intended by the parties, and shall be construed at all times, so as to ensure that City's obligation to make future payments of Rebates shall not constitute a legal indebtedness of City within the meaning of any applicable constitutional or statutory debt limitation prior to the adoption of a budget which appropriates funds for the payment of that installment or amount. In the event that any of the provisions of this Agreement are determined by a court of competent jurisdiction or by City's bond counsel to create, or result in the creation of, such a legal indebtedness of City, the enforcement of the said provision shall be suspended, and the Agreement shall at all times be construed and applied in such a manner as will preserve the foregoing intent of the parties, and no Event of Default by City shall be deemed to have occurred as a result thereof. If any provision of this Agreement or the application thereof to any circumstance is so suspended, the suspension shall not affect other provisions of this Agreement which can be

given effect without the suspended provision. To this end the provisions of this Agreement are severable.

B. City shall have no obligation to make a payment of a Rebate to Company if at any time during the term hereof City fails to appropriate funds for payment or City receives an opinion from its legal counsel to the effect that the use of Tax Increments resulting from the Property and Improvements to fund a Rebate payment to Company, as contemplated under Section 11 above, is not, based on a change in applicable law or its interpretation since the date of this Agreement, authorized or otherwise an appropriate urban renewal activity permitted to be undertaken by City under the Urban Renewal Act or other applicable provisions of the Code, as then constituted or under controlling decision of any Iowa court having jurisdiction over the subject matter hereof, or City's ability to collect Tax Increment from the Improvements and Property is precluded or terminated by legislative changes to Iowa Code Chapter 403. Upon occurrence of any of the foregoing circumstances, City shall promptly forward notice of the same to Company. If the circumstances continue for a period during which two (2) annual Rebate payments would otherwise have been paid to Company under the terms of this Agreement, then City may terminate this Agreement, without penalty or other liability to City, by written notice to Company.

C. For purposes of this Agreement, "Tax Increments" shall mean the property tax revenues on the Improvements and Property received by and made available to City for deposit in an account maintained under this Agreement, the provisions of Iowa Code§ 403.19 and the ordinance governing the Urban Renewal Plan.

9. **Conditions to City Funding.**

A. The complete or initial funding by City of the Rebates and other Project commitments shall be deemed an agreement of the parties that the applicable conditions to disbursement of funds shall, as of the date of such funding, have been satisfied or waived. If the conditions set forth in this Section are not satisfied at a Rebate disbursement date, this Agreement shall terminate unless a new disbursement date is established by amendment to this Agreement. The termination of this Agreement shall be the sole remedy available to City or Company if, for whatever reason, a condition set forth in this is not satisfied at a Rebate payment date, it being understood that each party shall nonetheless incur costs and liabilities prior thereto for which they alone are responsible. City and Company each expressly assumes all responsibility for the costs and liabilities they may each so incur prior to a Rebate payment date and agree to indemnify and hold each other harmless therefrom.

B. It is recognized and agreed that the ability of the City to perform the obligations described in this Agreement, including but not limited to the Rebate payments, is subject to completion and satisfaction of certain separate city council actions and required legal proceedings relating to the expansion of a tax increment financing (TIF) district, including the holding of public hearings on the same. Further, all the obligations of City under this Agreement are subject to fulfillment, on or before

each Rebate payment date, of each of the following conditions precedent:

(i) The representations and warranties made by Company and in this Agreement shall be true and correct as of the Rebate disbursement date with the same force and effect as if made at such date.

(ii) Company shall be in material compliance with all the terms and provisions of this Agreement.

(iii) There has not been, as of the Rebate disbursement date, a substantial change for the worse in the financial resources and ability of Company, or a substantial decrease in the financing commitments secured by Company for construction of the Improvements, which change(s) makes it likely, in the reasonable judgment of the City, that Company will be unable to fulfill its covenants and obligations under this Agreement.

10. **Additional Covenants of Company.** In to the other promises, covenants and agreements of Company as provided elsewhere in this Agreement, Company agrees as follows with respect to each phase of Improvements:

A. Company agrees during construction of the Improvements and thereafter until the MAA termination date to maintain, as applicable, builder's risk, property damage, and liability insurance coverages with respect to the Improvements in such amounts as are customarily carried by like organizations engaged in activities of comparable size and liability exposure, and shall provide evidence of such coverages to the City upon request.

B. Until the Improvements are Substantially Completed, Company shall make such reports to City, in such detail and at such times as may be reasonably requested by City, as to the actual progress of Company with respect to construction of the Improvements. However, in no event shall Company be required to submit a report more frequently than once every thirty (30) day period.

C. During construction of the Improvements and thereafter until the MAA termination date Company will cooperate fully with the City in resolution of any traffic, parking, trash removal or public safety problems which may arise in connection with the construction and operation of the Improvements.

D. Company will comply with all applicable land development laws and City and county ordinances, and all laws, rules and regulations relating to its businesses, other than laws, rules and regulations where the failure to comply with the same or the sanctions and penalties resulting therefrom, would not have a material adverse effect on the business, property, operations, or condition, financial or otherwise, of Company.

E. Until the MAA termination date Company will maintain, preserve and keep the Property, including but not limited to the Improvements, in good repair and working order, ordinary wear and tear excepted, and from time to time will make all necessary repairs, replacements, renewals and additions.

F. The Property will have a taxable value as set forth in the MAA and any amendments thereto, and Company agrees that the minimum assessed value of the Property and completed Improvements as stated in the MAA and any amendments thereto will be a reasonable estimate of the actual value of the Property and Improvements for ad valorem property tax purposes. Company agrees that it will spend enough in construction of the Improvements that, when combined with the value of the Property and related site improvements, will equal or exceed the assessor's minimum assessed value for the Property and Improvements as set forth in the MAA and any amendments thereto.

G. Until the MAA termination date Company agrees that (1) it will not undertake, in any other municipality in Black Hawk County, the construction or rehabilitation of any commercial property as a primary location for Company's business operations of the type to be conducted on the Property, and (2) it will make no conveyance, lease or other transfer of the Property or any interest therein that would cause the Property or any part thereof to be classified as exempt from taxation or subject to centralized assessment or taxation by the State of Iowa.

H. Company shall pay, or cause to be paid, when due, all real property taxes and assessments payable with respect to any and all parts of the Property conveyed to it. Until the MAA termination date, Company agrees that (1) it will not seek administrative review or judicial review of the applicability or constitutionality of any Iowa tax statute or regulation relating to the taxation of real property included within the Property that is determined by any tax official to be applicable to the Property or to Company, or raise the inapplicability or constitutionality of any such tax statute or regulation as a defense in any proceedings of any type or nature, including but not limited to delinquent tax proceedings, and (2) it will not seek any tax deferral, credit or abatement, either presently or prospectively authorized under Iowa Code Chapter 403 or 404, or any other state law, of the taxation of real property included within the Property.

11. **Representations and Warranties of City.** City hereby represents and warrants as follows:

A. City is not prohibited from consummating the transaction contemplated in this Agreement by any law, regulation, agreement, instrument, restriction, order or judgment.

B. Each person who executes and delivers this Agreement and all documents to be delivered hereunder is and shall be authorized to do so on behalf of City.

12. **Representations and Warranties of Company.** Company hereby represents and warrants as follows:

A. It is duly organized, validly existing, and in good standing under the laws of the state of its organization and is duly qualified and in good standing under the laws of the State of Iowa.

B. It has all requisite power and authority to own and operate its properties, to carry on its business as now conducted and as presently proposed to be conducted, and to enter into and perform its obligations under this Agreement.

C. This Agreement has been duly and validly executed and delivered by Company and, assuming due authorization, execution and delivery by the other parties hereto, is in full force and effect and is a valid and legally binding instrument of Company that is enforceable in accordance with its terms, except as the same may be limited by bankruptcy, insolvency, reorganization or other laws relating to or affecting creditors' rights generally.

D. The execution and delivery of this Agreement, the consummation of the transactions contemplated hereby, and the fulfillment of or compliance with the terms and conditions of this Agreement are not prevented by, limited by, in conflict with, or result in a violation or breach of, the terms, conditions or provisions of any contractual restriction, evidence of indebtedness agreement or instrument of whatever nature to which 'Company is now a party or by which it or its property is bound, nor do they constitute a default under any of the foregoing.

E. There are no actions, suits or proceedings pending or threatened against or affecting Company in any court or before any arbitrator or before or by any governmental body in which there is a reasonable possibility of an adverse decision which could materially adversely affect the business (present or prospective), financial position, or results of operations of Company or which in any manner raises any questions affecting the validity of the Agreement or Company's ability to perform its obligations under this Agreement.

F. The financing commitments, which Company will proceed with due diligence to obtain, to finance the construction of the Improvements will be sufficient to enable Company to successfully complete construction of the Improvements as contemplated in this Agreement, subject to additional costs incurred due to Unavoidable Delays.

13. **Indemnification and Releases.**

A. Company hereby releases City, its elected officials, officers, employees, and agents (collectively, the "indemnified parties") from, covenants and agrees that the indemnified parties shall not be liable for, and agrees to indemnify, defend and hold harmless the indemnified parties against, any loss or damage to property or any injury to or death of any person occurring at or about the Property arising after Company's lease or acquisition of the same or resulting from any defect in the Improvements. The indemnified parties shall not be liable for any damage or injury to the persons or property of Company or its directors, officers, employees, contractors or agents, or any other person who may be about the Property or the Improvements, due to any act of negligence or willful misconduct of any person, other than any act of negligence or willful misconduct on the part of any such indemnified party or its officers, employees or agents.

B. Except for any Willful misrepresentation, any willful misconduct, or any unlawful act of the indemnified parties, Company agrees to protect and defend the indemnified parties, now or forever, and further agrees to hold the indemnified parties harmless, from any claim, demand, suit, action or other proceedings or any type or nature whatsoever by any person or entity whatsoever that arises or purportedly arises from (1) any violation of any agreement or condition of this Agreement (except with respect to any suit, action, demand or other proceeding brought by Company against the City to enforce its rights under this Agreement), or (2) the acquisition and conditions of the Property and the construction, installation, ownership, and operation of the Improvements, or (3) any hazardous substance or environmental contamination located in or on the Property.

C. The provisions of this Section shall survive the expiration or termination of this Agreement.

14. **Obligations Contingent.** Each and every obligation of City under this Agreement is expressly made subject to and contingent upon City's completion of all procedures, hearings and approvals deemed necessary by City or its legal counsel for amendment of the urban renewal plan applicable to the Property and/or Project area, all of which must be completed within 90 days from the date this Agreement is approved by the City council. If such completion does not occur, then any conveyance, benefit or incentive of any type provided by City hereunder within said 90-day period is subject to reverter of title, revocation, repayment or other appropriate action to restore such property, benefit or incentive to City, and Company agrees to cooperate diligently and in good faith with any reasonable request by City to effectuate the restoration of same, or failing such restoration Company agrees to be liable for same or for the fair value thereof, plus interest on any sums owing at the rate of 5% per annum commencing with the date of demand for payment, if said payment is not remitted to City within 30 days.

15. **No Assignment or Conveyance.** Company agrees that it will not sell, convey, assign or otherwise transfer its interest in the Property prior to completion of the Project, whether in whole or in part, to any other person or entity without the prior written consent of City. Reasonable grounds for the City to withhold its consent shall include but are not limited to the inability of the proposed transferee to demonstrate to the City's satisfaction that it has the financial ability to observe all of the terms to be performed by Company under this Agreement. Notwithstanding the foregoing, (a) Company may assign the Property to an affiliate of Company without prior approval of City provided (i) the assignee assumes the obligations of Company under this Agreement, (ii) the assignee shall receive all Rebates payable as of and after the date of assignment, and (iii) Company provides written notice of assignment to City within five (5) business days after execution of assignment and (b) Company may mortgage the Property to a lender as security for financing of Project improvements, but for no other purpose.

16. **Default.** The following shall be "Events of Default" under this Agreement, and the term "Event of Default" shall mean any one or more of the following events that continues beyond any applicable cure periods:

A. Failure by Company to cause the construction of the Improvements to be commenced and completed pursuant to the terms, conditions and limitations of

this Agreement;

B. Transfer by Company of any interest (either directly or indirectly) in the Improvements, any part of the Property, or this Agreement, without the prior written consent of City except as security for financing of Improvements or the Project;

C. Failure by Company to pay, before delinquency, all ad valorem property taxes levied on or against any of the Property;

D. Failure by any party hereto to substantially observe or perform any covenant, condition, obligation or agreement on its part to be observed or performed under this Agreement;

E. Company (1) files any petition in bankruptcy or for any reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under the federal bankruptcy law or any similar state law; (2) makes an assignment for the benefit of its creditors; (3) admits in writing its inability to pay its debts generally as they become due; (4) is adjudicated a bankrupt or insolvent; or if a petition or answer proposing the adjudication of Company as a bankrupt or its reorganization under any present or future federal bankruptcy act or any similar federal or state law shall be filed in any court and such petition or answer shall not be discharged or denied within ninety (90) days after the filing thereof; or a receiver, trustee or liquidator of Company, or part thereof, shall be appointed in any proceedings brought against Company and shall not be discharged within ninety (90) days after such appointment, or if Company shall consent to or acquiesce in such appointment; or (5) defaults under any mortgage applicable to any of Property.

F. Any representation or warranty made by Company in this Agreement, or made by Company in any written statement or certificate furnished by Company pursuant to this Agreement, shall prove to have been incorrect, incomplete or misleading in any material respect on or as of the date of the issuance or making thereof.

17. **Remedies.**

A. Default by Company. Whenever any Event of Default in respect of Company occurs and is continuing, the City may terminate this Agreement upon a 30-day written notice. Upon termination, City may exercise any and all remedies available at law, equity, contract or otherwise for recovery of any sums paid by City to Company before the date of termination or to recover ownership of the Property as set forth in this Agreement.

B. Default by City. Whenever any Event of Default in respect of City occurs and is continuing, Company may take such action against City to require it to specifically perform its obligations hereunder. Before exercising such remedy, Company shall give 30 days' written notice to City of the Event of Default, provided that by the conclusion of such period the Event of Default shall not have been cured, or if the Event of Default cannot reasonably be cured within 30 days and City shall not have provided assurances reasonably satisfactory to the Company that the

Event of Default will be cured as soon as reasonably possible.

C. Remedies under this Agreement shall be cumulative and in addition to any other right or remedy given under this Agreement or existing at law or in equity or by statute. Waiver as to any particular default, or delay or omission in exercising any right or power accruing upon any default, shall not be construed as a waiver of any other or any subsequent default and shall not impair any such right or power. The remedies available to the City shall survive any termination of this Agreement.

18. **Materiality of Company's Promises, Covenants, Representations, and Warranties.** Each and every promise, covenant, representation, and warranty set forth in this Agreement on the part of Company to be performed is a material term of this Agreement, and each and every such promise, covenant, representation, and warranty constitutes a material inducement for City to enter this Agreement. Company acknowledges that without such promises, covenants, representations, and warranties, City would not have entered this Agreement. Upon breach of any promise or covenant, or in the event of the incorrectness or falsity of any representation or warranty, City may, at its sole option and in addition to any other right or remedy available to it, terminate this Agreement and declare it null and void.

19. **Performance by City.** Company acknowledges and agrees that all of the obligations of City under this Agreement shall be subject to, and performed by City In accordance with, all applicable statutory, common law, or constitutional provisions and procedures consistent with City's lawful authority. All covenants, stipulations, promises, agreements and obligations of City contained in this Agreement shall be deemed to be the covenants, stipulations, promises, agreements and obligations of City and not of any governing body member, officer, employee or agent of City in the individual capacity of such person.

20. **No Third-Party Beneficiaries.** No rights or privileges of any party hereto shall inure to the benefit of any contractor, subcontractor, material supplier, or any other person or entity, and no such contractor, subcontractor, material supplier, or other person or entity shall be deemed to be a third-party beneficiary of any of the provisions of this Agreement.

21. **Notices.** Notice under this Agreement shall be in writing and shall be delivered in person, by overnight air courier service, by United States registered or certified mail, postage prepaid, and addressed:

(a) If to City, 715 Mulberry Street, Waterloo, Iowa 50703, Attention: Mayor, with copies to the City Attorney and the Community Planning and Development Director.

(b) If to Company, Shawn Kelly, 623 E 19th Street, Cedar Falls, Iowa 50613

Delivery of notice shall be deemed completed upon: (i) on the date of delivery when delivered in person, (ii) one (1) business day following deposit for overnight delivery to an overnight air courier service which guarantees next day delivery, (iii) three (3) business days following the date of deposit if mailed by United States registered or certified mail, postage prepaid, or (iv) when transmitted by facsimile or electronic mail so

long as the sender obtains electronic confirmation that such transmission was successful. A party may change the address for giving notice by any method set forth in this Section.

22. **No Joint Venture.** Nothing in this Agreement shall, or shall be deemed or construed to, create or constitute any joint venture, partnership, agency, employment, or any other relationship between the City and Company nor to create any liability for one party with respect to the liabilities or obligations of the other party or any other person.

23. **Amendment, Modification, and Waiver.** No amendment, modification, or waiver of any condition, provision, or term of this Agreement shall be valid or of any effect unless made in writing, signed by the party or parties to be bound or by the duly authorized representative of same, and specifying with particularity the extent and nature of the amendment, modification, or waiver. Any waiver by any party of any default by another party shall not affect or impair any rights arising from any subsequent default.

24. **Severability; Reformation.** Each provision, section, sentence, clause, phrase, and word of this Agreement is intended to be severable. If any portion of this Agreement shall be deemed invalid or unenforceable, whether in whole or in part, the offending provision or part thereof shall be deemed severed from this Agreement and the remaining provisions of this Agreement shall not be affected thereby and shall continue in full force and effect. If, for any reason, a court finds that any portion of this Agreement is invalid or unenforceable as Written, but that by limiting such provision or portion thereof it would become valid and enforceable, then such provision or portion thereof shall be deemed to be written, and shall be construed and enforced, as so limited.

25. **Captions.** All captions, headings, or titles in the paragraphs or sections of this Agreement are inserted only as a matter of convenience and/or reference, and they shall in no way be construed as limiting, extending, or describing either the scope or intent of this Agreement or of any provisions hereof.

26. **Interpretation.** This Agreement shall not be construed more strictly against one party than against the other merely by virtue of the fact that it may have been prepared by counsel for one of the parties, it being recognized that the parties hereto and their respective attorneys have contributed substantially and materially to the preparation of each and every provision of this Agreement.

27. **Binding Effect.** This Agreement shall be binding and shall inure to the benefit of the parties and their respective successors, assigns, and legal representatives.

28. **Counterparts.** This may be executed in multiple counterparts, each of which shall be deemed an original and all of which, taken together, shall constitute one and the same instrument.

29. **Entire Agreement.** This Agreement, together with the exhibits attached hereto, constitutes the entire agreement of the parties and supersedes all prior or contemporaneous negotiations, discussions, understandings, or agreements, whether

oral or written, with respect to the subject matter hereof.

30. **Time of Essence.** Time is of the essence of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Development Agreement by their duly authorized representatives as of the date set forth above.

[signatures on next page]

CITY OF WATERLOO, IOWA

By: _____
David Boesen, Mayor

Attest: _____
Kelley Felchle, City Clerk

KEL-MAR, L.C

By: S Kelly

Name: Shawn Kelly

Title: Manager / Member

EXHIBIT A

Description

Parcel D of the Plat of Survey recorded as Document No. 2026-07293 in the Office of the Black Hawk County Recorder, Black Hawk County, Iowa.

EXHIBIT B

MINIMUM ASSESSMENT AGREEMENT

This Minimum Assessment Agreement (the "Agreement") is entered into as of this _____ day of _____, 202___, and among the CITY OF WATERLOO, IOWA ("City") and KEL-MAR, L.C ("Company"), and the COUNTY ASSESSOR of the BLACK HAWK COUNTY, IOWA ("Assessor").

WITNESSETH:

WHEREAS, on or before the date hereof the City and Company have entered into a development agreement (the "Development Agreement") regarding certain real property (the "Property"), described in Exhibit "A" thereto, located in the City; and

WHEREAS, it is contemplated that pursuant to the Development Agreement, the Company will undertake the development of an area within the City and within the East Waterloo Unified Urban Renewal and Redevelopment Plan area, including the construction of certain improvements as described in the Development Agreement (the "Minimum Improvements") on the Property (the "Project"); and

WHEREAS, pursuant to Iowa Code§ 403.6, as amended, the City and the Company desire to establish a minimum assessed value for the Property and the Minimum Improvements to be constructed thereon by Company pursuant to the Development Agreement, which shall be effective upon substantial completion of the Project and from then until this Agreement is terminated pursuant to the terms herein and which is intended to reflect the minimum assessed value of the land and buildings as to the Project only; and

WHEREAS, the City and the Assessor have reviewed the preliminary plans and specifications for the Minimum Improvements which the parties contemplate will be erected as a part of the Project.

NOW, THEREFORE, the parties hereto, in consideration of the promises, covenants, and agreements made by each other, do hereby agree as follows:

1. Upon completion of construction of the Minimum Improvements by Company, the minimum actual taxable value which shall be fixed for assessment purposes for the Property and Minimum Improvements to be constructed thereon by Company as a part of the Project shall not be less than $3,030,000.00 (the "Minimum assessed value") until termination of this Agreement. The parties hereto agree that construction of the Minimum Improvements will be substantially completed by the date set forth in the Development Agreement, and in any case if the Minimum Improvements are not substantially completed by December 31, 2027, the parties agree to execute an amendment to this Agreement that will extend the date specified in Section 2 below.

2. The Minimum assessed value herein established shall be of no further force and effect, and this Minimum Assessment Agreement shall terminate, on December 31, 2044. The Minimum assessed value shall be maintained during such period regardless of: (a) any failure to complete the Minimum Improvements; (b) destruction of all or any

portion of the Minimum Improvements; (c) diminution in value of the Property or the Minimum Improvements; or (d) any other circumstance, whether known or unknown and whether now existing or hereafter occurring.

3. Company shall pay, or cause to be paid, when due, all real property taxes and assessments payable with respect to all and any parts of the Property and the Minimum Improvements pursuant to the provisions of this Agreement and the Development Agreement. Such tax payments shall be made without regard to any loss, complete or partial, to the Property or the Minimum Improvements, any interruption in, or discontinuance of, the use, occupancy, ownership or operation of the Property or the Minimum Improvements by Company or any other matter or thing which for any reason interferes with, prevents or renders burdensome the use or occupancy of the Property or the Minimum Improvements.

4. Company agrees that its obligation to make the tax payments required hereby, to pay the other sums provided for herein, and to perform and observe its other agreements contained in this Agreement shall be absolute and unconditional obligations of Company (not limited to the statutory remedies for unpaid taxes) and that Company shall not be entitled to any abatement or diminution thereof, or set off therefrom, nor to any early termination of this Agreement for any reason whatsoever.

5. Nothing herein shall be deemed to waive the Company's rights under Iowa Code§ 403.6, as amended, to contest that portion of any actual value assignment made by the Assessor in excess of the Minimum assessed value established herein. In no event, however, shall the Company seek or cause the reduction of the actual value assigned below the Minimum assessed value established herein during the term of this Agreement. Nothing herein shall limit the discretion of the Assessor to assign at any time an actual value to the land and Minimum Improvements in excess of the Minimum assessed value.

6. Company agrees that during the term of this Agreement it will not:

(a) seek administrative review or judicial review of the applicability or constitutionality of any Iowa tax statute relating to the taxation of property contained as a part of the Property or the Minimum Improvements determined by any tax official to be applicable to the Property or the Minimum Improvements, or raise the inapplicability or constitutionality of any such tax statute as a defense in any proceedings, including delinquent tax proceedings; or

(b) seek any tax deferral, credit or abatement, either presently or prospectively authorized under Iowa Code Chapter 403 or 404, or any other state law, of the taxation of real property, including improvements and fixtures thereon, contained in the Property or the Minimum Improvements; or

(c) request the Assessor to reduce the Minimum assessed value; or

(d) appeal to the board review of the city, county, state or to the Director of Revenue of the State of Iowa to reduce the Minimum assessed value; or

(e) cause a reduction in the actual value or the Minimum assessed value through any other proceedings.

7. This Agreement shall be promptly recorded by the City with the Recorder of Black Hawk County, Iowa. The City shall pay all costs of recording.

8. Neither the preambles nor provisions of this Agreement are intended to, or shall be construed as, modifying the terms of the Development Agreement.

9. Each provision, section, sentence, clause, phrase, and word of this Agreement is intended to be severable. If any portion of this Agreement shall be deemed invalid or unenforceable, whether in whole or in part, the offending provision or part thereof shall be deemed severed from this Agreement and the remaining provisions of this Agreement shall not be affected thereby and shall continue in full force and effect. If, for any reason, a court finds that any portion of this Agreement is invalid or unenforceable as written, but that by limiting such provision or portion thereof it would become valid and enforceable, then such provision or portion thereof shall be deemed to be written, and shall be construed and enforced, as so limited.

10. This Agreement shall inure to the benefit of and be binding upon the successors and assigns of the parties, including but not limited to future owners of the Project property.

IN WITNESS WHEREOF, the parties have executed this Minimum Assessment Agreement by their duly authorized representatives as of the date det forth above.

[signatures on next page]

CITY OF WATERLOO, IOWA

By: _____
David Boesen, Mayor

Attest: _____
Kelley Felchle, City Clerk

KEL-MAR, L.C

By: S Kelly

Name: Shawn Kelly

Title: Manager / Member

STATE OF IOWA)
) **ss.**
COUNTY OF BLACK HAWK)

On this _____ day of _____, 202__, before me, a notary public in and for the State of Iowa, personally appeared Quentin M. Hart and Kelley Felchle, to me personally known, who being duly sworn, did say that they are the Mayor and City Clerk, respectively, of the City of Waterloo, Iowa, a municipal corporation, created and existing under the laws of the State of Iowa, and that the seal affixed to the foregoing instrument is the seal of said municipal corporation, and that said instrument was signed and sealed on behalf of said municipal corporation by authority and resolution of its City Council, and said Mayor and City Clerk acknowledged said instrument to be the free act and deed of said municipal corporation by it and by them voluntarily executed.

_____
Notary Public

STATE OF Iowa)
) **ss.**
COUNTY OF Black Hawk)

Subscribed and sworn before me on Aug. 11, 2026 by Shawn Kelly as Manager/Member (title) of KEL-MAR, L.C.

_____
Notary Public

NOTARIAL SEAL IOWA
DANIELLE SUE MORRIS
COMMISSION NO. 810985
MY COMMISSION EXPIRES
June 11, 2026

EXHIBIT C

The Concept Plan for West Big Rock Road Development, dated July 7, 2026, is hereby designated as Exhibit C.

CERTIFICATION OF ASSESSOR

The undersigned, having reviewed the plans and specifications for the Minimum Improvements to be constructed and the market value assigned to the land upon which the Minimum Improvements are to be constructed for the development, and being of the opinion that the minimum market value contained in the foregoing Minimum Assessment Agreement appears reasonable, hereby certifies as follows: The undersigned Assessor, being legally responsible for the assessment of the property described in the foregoing Minimum Assessment Agreement, certifies that the actual value assigned to that land and improvements upon completion shall not be less than Three Million and Thirty Thousand and 00/ 100 Dollars ($3,030,000.00) until termination of this Minimum Assessment Agreement pursuant to the terms hereof, subject to adjustment as provided in said agreement.

_____ _____

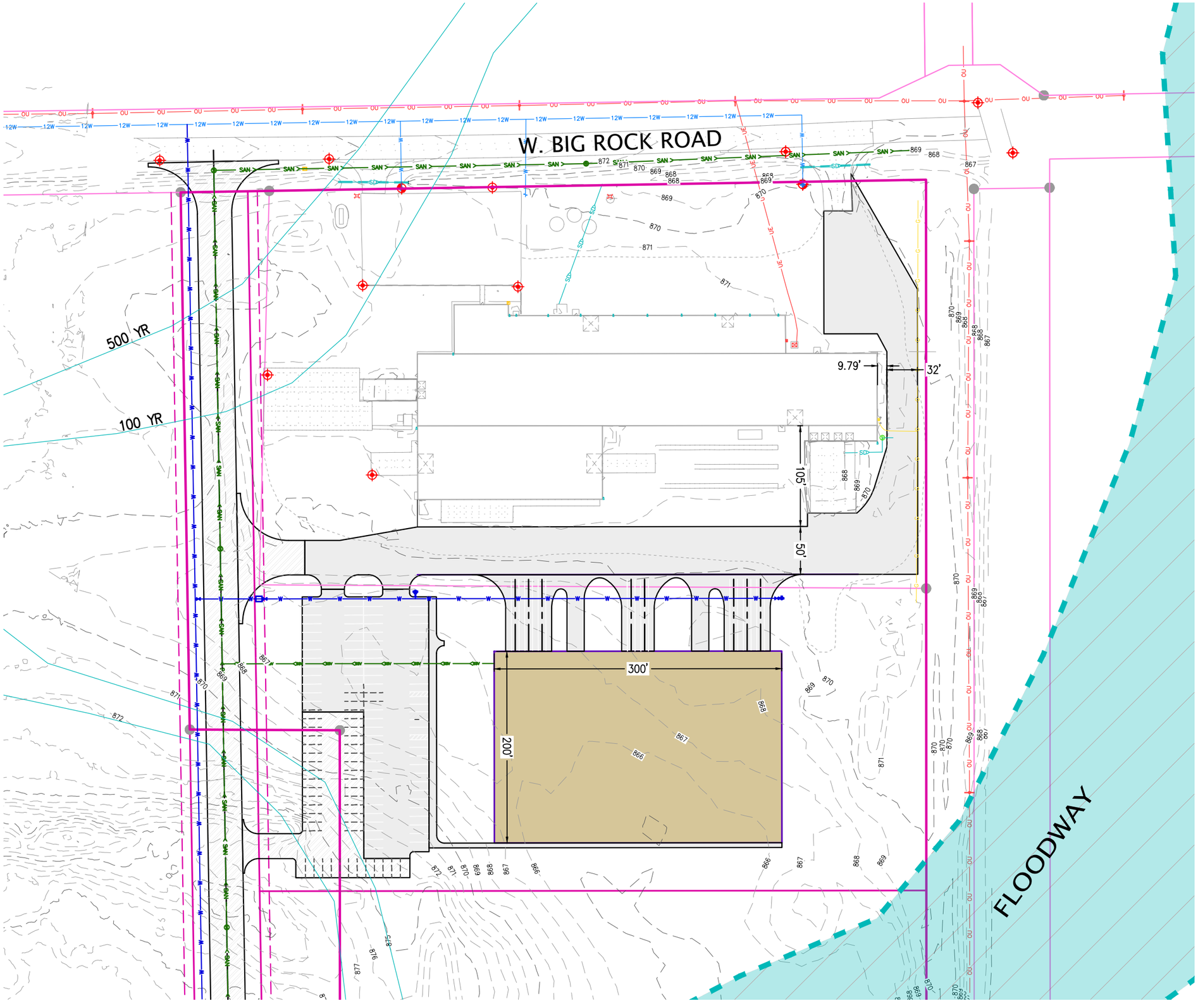
Date Assessor for Black Hawk County, Iowa

STATE OF IOWA)
) ss.
COUNTY OF BLACK HAWK)

Subscribed and sworn to before me on_____
by T.J. Koenigsfeld, Assessor for Black Hawk County, Iowa.

_____

Notary Public



NOTES:

- FLOOD DATA DERIVED FROM FEMA FIRM MAP 19013C0186F, EFF. DATE JULY 18, 2011
- CONTOURS WITHIN PROPERTY PER TOPOGRAPHIC SURVEY COMPLETED JUNE 2026.
- CONTOURS BEYOND PROPERTY DERIVED FROM IOWA LIDAR MAPPING DATA.

NOT FOR CONSTRUCTION

DESIGN SOLUTIONS
CIVIL ENGINEERS

CONCEPT

KEL-MAR NEW BUILDING

1575 W. BIG ROCK ROAD
KEL-MAR, LC

1 of 2

7/7/2026
PRELIM

FLOODWAY

100 YR

500 YR

NOTES:

- FLOOD DATA DERIVED FROM FEMA FIRM MAP 19013C0186F, EFF. DATE JULY 18, 2011
- CONTOURES WITHIN PROPERTY PER TOPOGRAPHIC SURVEY COMPLETED JUNE 2026.
- CONTOURS BEYOND PROPERTY DERIVED FROM IOWA LIDAR MAPPING DATA.

0' 100' 200'

100 YR

500 YR

W. BIG ROCK ROAD

NOT FOR CONSTRUCTION

DESIGN SOLUTIONS
CIVIL ENGINEERS

CONCEPT

KEL-MAR NEW BUILDING

1575 W. BIG ROCK ROAD
KEL-MAR, LC

2 of 2

7/7/2026
PRELIM

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Bridgett Wood, Finance Director
Finance Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution in support of grant applications and continued development of a proposed three-year, two-zone Cedar Valley Micro-Transit Pilot Program at a total program cost not to exceed $4,600,000.00.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

Given the pilot nature of the proposed project and the absence of comparable historical data locally, projections are inherently uncertain. The figures provided are good-faith, planning-level estimates based on the information currently available and are anticipated to be adjusted as actual program experience is gained.

The project represents a new service model for the community, and there is no established baseline from which to reliably forecast demand, utilization, or operating costs. Accordingly, the estimates presented should be viewed as reasonable preliminary assumptions intended to support project planning. Actual results will be monitored closely and used to refine future operations and projections.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

The portion for the City of Waterloo will come from our unrestricted General Fund Reserves in a good faith effort to spend our unrestricted fund reserve and also potentially from the transit levy each year.

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. 2026-000-09.08.2026
2. 10 - Project Budget
3. Operational Cost Breakdown

Prepared by LeAnn M. Even, Deputy City Clerk, City of Waterloo, 715 Mulberry Street, Waterloo, IA 50703, (319) 291-4323.

RESOLUTION NO. 2026-

RESOLUTION IN SUPPORT OF GRANT APPLICATIONS AND CONTINUED DEVELOPMENT OF A PROPOSED THREE-YEAR, TWO-ZONE CEDAR VALLEY MICROTRANSIT PILOT PROGRAM AT A TOTAL PROGRAM COST NOT TO EXCEED $4,600,000

WHEREAS, access to safe, reliable, and affordable transportation is important to the economic vitality and quality of life of residents throughout the Cedar Valley; and

WHEREAS, microtransit may help address transportation gaps by providing flexible, demand-responsive transportation to residents, employees, students, seniors, individuals with disabilities, and others who may have limited access to traditional transportation options; and

WHEREAS, the Cedar Valley Micro Transit Task Force has been evaluating the feasibility, structure, estimated cost, potential funding sources, and community benefits of implementing a regional microtransit pilot program; and

WHEREAS, the proposed three-year pilot program would improve access to public transit; and

WHEREAS, each service zone is anticipated to operate three passenger vans, with two wheelchair-accessible vehicles and spare vehicles shared between the two zones; and

WHEREAS, the estimated total cost of the three-year pilot program is $4,600,000, consisting of the one-time upfront costs and three years of estimated operational costs; and

WHEREAS, the total cost of the three-year pilot program shall not exceed $4,600,000, or $2,300,000 per service zone, without further approval by the applicable governing bodies; and

WHEREAS, the preliminary funding plan identifies potential financial participation from Waterloo, Cedar Falls, federal and state grant programs, regional entities, nonprofit organizations, private-sector partners, and other available funding sources; and

WHEREAS, the City Council supports pursuing all available grant funding, partner contributions, fare revenue, and other outside financial assistance to reduce the amount of local funding required for the program; and

WHEREAS, the City Council recognizes that City financial participation may be necessary to implement and operate the three-year pilot program; and

WHEREAS, the pilot program will allow the participating communities to evaluate ridership, service demand, operational costs, fare revenue, performance, and the program's potential to become financially self-sustaining; and

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Waterloo, Iowa, that the City of Waterloo hereby supports grant applications and continued development of a proposed three-year, two-zone Cedar Valley Micro Transit Pilot program:

1. The City Council hereby supports the continued development and proposed implementation of a three-year Cedar Valley microtransit pilot program consisting of two service

zones: Zone 1 serving Cedar Falls and Zone 2 serving Waterloo.

2. The City Council authorizes the Cedar Valley Micro Transit Task Force, in coordination with appropriate staff from the participating communities, to identify, prepare, and submit applications for federal, state, regional, private, nonprofit, and other available grant funding or financial assistance for the planning, startup, implementation, operation, and evaluation of the proposed pilot program.

3. The Mayor, City Clerk, Finance Director, and other appropriate City officials are authorized to execute letters of support, certifications, application documents, and other materials reasonably necessary to submit eligible grant applications on behalf of the City.

4. The proposed program budget shall not exceed $4,600,000 over the three-year pilot period without further approval by the City Council. The current estimated program costs shall be allocated equally between the two service zones as follows:

			Annual Operational Costs*		
	Total 3-Year Cost (not to exceed)	**One-Time Upfront Costs**	**Year 1**	**Year 2**	**Year 3**
Zone 1 (Cedar Falls)	$2,300,000.00	$67,700.00	$670,000.00	$700,000.00	$730,000.00
Zone 2 (Waterloo)	$2,300,000.00	$67,700.00	$670,000.00	$700,000.00	$730,000.00
Total All Zones	**$4,600,000.00**	**$135,400.00**	**$1,340,000.00**	**$1,400,000.00**	**$1,460,000.00**

5. The preliminary funding plan identifies the following direct financial participation from Waterloo and Cedar Falls:

Funding Source	Year 1 (FY28)	Year 2 (FY29)	Year 3 (FY30)
Waterloo	$185,000.00	$135,375.00	$135,750.00
2% Levy Increase (Waterloo)	$15,000.00	$15,500.00	$16,000.00
Cedar Falls	$185,000.00	$135,375.00	$135,750.00
2% Levy Increase (Cedar Falls)	$5,000.00	$5,250.00	$5,500.00

The preliminary funding plan anticipates grant funding, regional participation, nonprofit contributions, private-sector support, and other outside funding totaling approximately $1,085,400 in Year One, $1,108,500 in Year Two, and $1,167,000 in Year Three, for total anticipated outside funding of $3,360,900 over the three-year pilot period.

6. The funding amounts and sources identified in Sections 5 and 6 constitute a preliminary working plan only. Inclusion of a potential funding source does not represent confirmation or acceptance of a grant award, contribution, or other funding commitment.

7. Because grants and other outside funding sources are intended to support the overall two-zone program, the allocation of those revenues between the Waterloo and Cedar Falls service zones shall be determined through the applicable grant requirements, award documents, intergovernmental agreements, or other funding agreements.

8. The City Council expresses its intent to consider providing City financial support for the Waterloo service zone after applying all available grant proceeds, partner contributions, fare revenue, and other outside funding to the program's eligible costs.

9. Before the City incurs any financial or contractual obligation, the final program design, service boundaries, implementation schedule, confirmed funding sources, grant conditions, projected fare revenue, amount and timing of Waterloo's contribution, and applicable service or intergovernmental agreements shall be presented to the City Council for approval.

10. Any City funding for the pilot program shall be subject to City Council approval and appropriation through the applicable annual budget or budget-amendment process. Any anticipated use of revenues associated with a levy increase shall also remain subject to all applicable legal, budgetary, and City Council requirements.

11. City staff and the Cedar Valley Micro Transit Task Force shall continue seeking grants, partner contributions, fare revenue, and other funding throughout the pilot period to minimize the cost to Waterloo taxpayers and work toward making the program financially self-sustaining.

12. The pilot program shall include regular financial and operational reporting to the City Council, including information regarding ridership, service levels, program costs, fare revenue, grant funding, local contributions, performance measures, and progress toward long-term financial sustainability.

13. Nothing in this resolution constitutes a commitment to continue the microtransit program beyond the approved three-year pilot period. Any continuation, expansion, or permanent implementation of the program shall require further consideration and approval by the City Council.

PASSED AND ADOPTED this 8th day of September 2026.

ATTEST: _____
David Boesen, Mayor

_____
Kelley Felchle, City Clerk

SEAL

BUDGET

Micro Transit Budget Outline						
Scenario 1: 8 am - 6 pm 7 days/week						
				Annual Operational Costs*		
	Fleet Composition	**Total 3-Year Cost (not to exceed)**	**One-Time Upfront Costs**	**Year 1**	**Year 2**	**Year 3**
Zone 1 (Cedar Falls)	3 vans, plus spares shared between zones	$ 2,300,000.00	$ 67,700.00	$ 670,000.00	$ 700,000.00	$ 730,000.00
Zone 2 (Waterloo)	3 vans, plus spares shared between zones	$ 2,300,000.00	$ 67,700.00	$ 670,000.00	$ 700,000.00	$ 730,000.00
Total All Zones	**6 Passenger Vans (Incl. 2 WAV), Plus 2 Spare Vehicles**	**$ 4,600,000.00**	**$ 135,400.00**	**$ 1,340,000.00**	**$ 1,400,000.00**	**$ 1,460,000.00**
** State Transit Assistance Special Projects Program may fund a portion of 2 years' operating costs.*						
Funding Source	**Year 1 (FY28)**	**Year 2 (FY29)**	**Year 3 (FY30)**	**Notes**		
Waterloo	$185,000.00	$135,375.00	$135,750.00			
2% Levy Increase	$15,000.00	$15,500.00	$16,000.00			
Cedar Falls	$185,000.00	$135,375.00	$135,750.00			
2% Levy Increase	$5,000.00	$5,250.00	$5,500.00			
IDOT	$150,000.00	$150,000.00	$150,000.00			
Schoitz	$200,000.00	$200,000.00	$200,000.00			
Gaming	$250,000.00	$250,000.00	$250,000.00			
Private: Tyson	$30,000.00	$30,000.00	$30,000.00			
Private: Deere, Unity Point, Target, etc.)	$5,400.00	$28,500.00	$87,000.00			
Carbon Reduction Program (CRP)	$100,000.00	$100,000.00	$100,000.00			
MET (CARES)	$250,000.00	$250,000.00	$250,000.00			
ICAPP	$100,000.00	$100,000.00	$100,000.00			
Total	$1,475,400.00	$1,400,000.00	$1,460,000.00			
Project Cost	*$1,475,400.00	$1,400,000.00	$1,460,000.00	*Includes one-time upfront cost		
Balance	$0.00	$0.00	$0.00			
Options for gap:						
- increase fares						
- State/Fed mileage reimbursement increase (with program expansion)?						

Detailed Pricing Breakdown for INRCOG / Cedar Valley Waterloo

Vanhour Cost Breakdown	Year 1	Year 2	Year 3
Driver Pay	$21.75	$22.62	$23.53
Vehicle Cost	$19.24	$20.01	$20.82
Customer Support	$5.22	$5.43	$5.65
Technology	$4.62	$4.81	$5.00
Other (Field Manager, Central Support Staff, Marketing, Insurance, etc.)	$26.21	$27.26	$28.35
Total Cost per Hour	**$77.06**	**$80.14**	**$83.35**

Upfront Cost Breakdown	Year 1	Year 2	Year 3
Upfront Vehicle Costs	$102,000	$0	$0
WAVs	*$63,000*	*$0*	*$0*
Wraps	*$24,000*	*$0*	*$0*
Hardware	*$15,000*	*$0*	*$0*
Tech Installation Fee	$15,000	$0	$0
Upfront driver acquisition, marketing, and launch costs	$18,400	$0	$0
Total Cost per Hour	**$135,400**	**$0**	**$0**

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Angie Fordyce, Community Development Coordinator
Community Development Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Resolution approving the contract for services with the Iowa Northland Regional Council of Governments of Waterloo, Iowa, in the amount of $5,500.00, in conjunction with the St. Mary's Development, and authorizing the Mayor and City Clerk to execute said document.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

The contract will allow INRCOG to conduct an environmental assessment of the St. Mary's development site for the roadway and new construction housing as required by Federal regulation for the use of Federal funding.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. INRCOG Contract for Environmental Review

CONTRACT FOR SERVICES BETWEEN THE
IOWA NORTHLAND REGIONAL COUNCIL OF GOVERNMENTS
AND
City of Waterloo
(Environmental Review – St. Mary's Development)

THIS CONTRACT, entered into by and between the Iowa Northland Regional Council of Governments (hereinafter called the Planning Agency) and the City of Waterloo. The City of Waterloo (hereinafter called the City) hereby requests the Planning Agency's assistance in carrying out this Contract and attached Scope of Services and approved by the Planning Agency under the U.S. Department of Housing and Urban Development's (HUD) program requirements.

TERMS. This contract carries the following terms:

SECTION 1. Scope of Services

The Planning Agency shall provide and perform the necessary services required to carry out the Contract as set out in the attached Scope of Services.

SECTION 2. Time of Performance

The services of the Planning Agency shall commence on September 9, 2026, and shall be finished upon completion of final environmental review.

SECTION 3. Method of Payment

Payment shall be due upon receipt of a monthly bill for actual work performed. The payment shall be based on the hourly rate of the staff person plus any associated costs incurred in the administration of this contract. Total payment shall not exceed amounts identified as administrative/project delivery costs in the project budget of the grant program. Payment for each environmental review shall be $5,500 with a not to exceed total of $5,500.00.

SECTION 4. Personnel

The Planning Agency represents that it has, or will acquire, all personnel necessary in performing the services under this Contract. The parties intend that an independent contractor-purchaser of service relationship will be created by this Contract. The City is interested only in the results achieved, and the conduct and control of the work will lie solely with the Planning Agency. Neither the Planning Agency nor its employees are to be considered agents or employees of the City for any purpose.

SECTION 5. Property

The Planning Agency shall be free to acquire or use existing property, real or personal, as it deems necessary in the performance of work under this agreement.

SECTION 6. Services to be Furnished to the Planning Agency

All reports, data or other public documents and information necessary to the performance of work under this Contract shall be made available to the Planning Agency.

SECTION 7. Records Available

At any time during normal business hours and as often as is necessary, each party shall make available to the other party and federal or state agents and financial and administrative records with respect to all matters covered by this agreement.

SECTION 8. Maintenance of Records

The Planning Agency shall maintain all financial and administrative records for a period of five (5) years from the date of final payment by the federal or state funding agency. In addition, those records which relate to any "Dispute" appeal under a grant agreement, to litigation, to the settlement of claims arising out of such performance, or to costs or items to which an audit exception has been taken shall be maintained and made available until five years after the date of resolution of such appeal, litigation, claim, or exception.

SECTION 9. Federal Contract Language

In connection with implementing this agreement, the City of Waterloo and the Iowa Northland Regional Council of Governments agree to comply with the following acts:

A. All required contract language for HUD funded projects.
B. All amendments and regulations issued thereto which apply to the project.

SECTION 10. Termination Clause

Either party assigned hereto shall have the authority to terminate this Contract, with just cause, by notifying the other party by registered mail not less than thirty (30) days prior to the effective termination date. The Planning Agency will be paid for the time provided and expenses incurred through the termination date.

SECTION 11. Amendment and Designation of Officials

11.1 The City - The Mayor of the City of Waterloo is the official authorized to execute any changes in the terms, conditions, or amounts specified in this Contract.

11.2 The Planning Agency - The Executive Director of the Iowa Northland Regional Council of Governments is the contractor official authorized to execute any changes in the terms, conditions, or amounts specified in this Contract.

SECTION 12. Saving Clause

Should any provisions of this Contract be deemed unenforceable by a court of law, all of the other provisions shall remain in effect.

SECTION 13. Entire Agreement Statement

This Contract contains the entire agreement between the Planning Agency and the City for the purpose of HUD's program administration. There are no other written or oral agreements, understandings, or contracts that shall take precedence over the items contained herein, unless they have been made a part of this

Contract per Section 2.

SECTION 14. Hold Harmless

The City shall hold harmless, waive, and indemnify the Planning Agency against all claims, liabilities, and costs, including reasonable attorney fees, of defending any claim or suit, including those by any third party, arising out of the services provided by the Planning Agency, except to the extent caused by the gross negligence or willful misconduct of the Planning Agency or its employees. In no event shall the Planning Agency be liable to the City for lost revenues of the City, or special or consequential damages, even if the Planning Agency has been advised of the possibility of such damages. The Planning Agency's total liability under this Agreement for damages, costs and expenses, regardless of cause, shall not exceed the total amount of fees paid to the Planning Agency by the City under this Agreement.

PASSED AND APPROVED:

IOWA NORTHLAND REGIONAL COUNCIL OF GOVERNMENTS	City of Waterloo
_____ Date	_____ Date
_____ Executive Director	_____ Mayor
ATTEST:	ATTEST:
_____ Director of Development	_____

SCOPE OF SERVICES

The Iowa Northland Regional Council of Governments shall assist in compliance with HUD requirements; maintenance of required records and documents; and other required actions not specifically listed, but requested by the local government, including but not limited to the following activities:

Environmental Review and Release of Funds ($5,500)

A. One (1) Environmental Review in Compliance with HUD Requirements

1. All required environmental review documents and request for release of funds for the St. Mary's Site Development within the City of Waterloo.

The above outline is intended to be specific, but some areas may have more detailed requirements implied but not listed.

The Iowa Northland Regional Council of Governments will assist the City of Waterloo with these requirements unless special requests are made to the Executive Director or governing body of the grantee.

The City of Waterloo may request assistance from the Iowa Northland Regional Council of Governments that is not specifically designated.

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Randy Bennett, Public Works Division Manager
Finance Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

An ordinance amending sewer user charges and fees relating to monthly winter consumption.

RECOMMENDED COUNCIL ACTION

SUMMARY STATEMENT AND BACKGROUND INFORMATION

During the codification of the ordinance updates for sewer fees, #1 of Title 8, Public Utilities, Chapter 3, Sewer Regulations, Article A, User Charges and Fees of Section 2, Determination of Rates and Charges, was removed in error. This is to add the language back in with updates due to the change from quarterly billing to monthly billing.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. Ordinance - Title 8 Chapter 3 Article A Section 2 - Sewer Rates - Redlined - Adding #1 back and updating language
2. Water and Sewer Billing Aug 2026 (1)

ARTICLE A. USER CHARGES AND FEES

SECTION:

8-3A-1: Wastewater Volume

8-3A-2: Determination Of Rates And Charges

8-3A-3: Charges And Fees

8-3A-4: Connection Charges

8-3A-4-1: Building Sewer Connection Charges; Determination

8-3A-4-2: Cross And Lateral Sewer Connection Charges

8-3A-4-3: Use Of Sewer Connection Charges

8-3A-4-4: Permitted Connections

8-3A-4-5: Violations And Penalties

8-3A-1: WASTEWATER VOLUME:

A. For purposes of establishing user charges, the quantity of wastewater discharged to the POTW by a user shall be determined by and held to be the quantity of water used based on water meter readings of the waterworks or private water supply unless otherwise approved by the Superintendent. If a user shall use water which comes from a private water supply, the user shall meter the water at his own expense when required by the Superintendent and shall pay the appropriate user charges.

B. All charges and fees not otherwise provided for in this article shall be set by resolution. (Ord. 4261, 10-6-1997)

8-3A-2: DETERMINATION OF RATES AND CHARGES:

~~A.~~ Each connection to the POTW shall pay user charges in accordance with the following schedule:

1. The maximum monthly rate for residential accounts shall be based on one hundred percent (100%) of the monthly water consumption during the winter months as determined and recorded by Waterloo Waterworks. Industrial users will be billed on actual water consumption unless otherwise approved by the General Manager. Any special or private contracts shall be metered at the user's expense.

2. Users who have their own private wells shall pay a minimum sixty nine dollars seventy six cents ($69.76) per quarter, unless required to properly meter wastewater flows by the Superintendent.

3. Users who are located outside of the limits of the City shall pay double the rates specified herein, unless an agreement has been reached and signed between the City of Waterloo and the contributing municipality or entity.

4. If the rates as specified in this section are not paid when due as required by this section, there shall be added to the rates a penalty of five percent (5%). The Clerk shall certify to the County Treasurer all sewer rates, charges or rentals and penalties delinquent.

5. A surcharge for wastewaters in excess of domestic strength and containing no such chemical or other substances as would interfere with the proper operation of the purifying plant, shall be computed according to the following formula:

BOD	-	$0.10/pound
TSS	-	0.10/pound
TKN	-	0.10/pound

6. The following sewer rental charge shall become effective beginning August 1, 2024:

Minimum monthly charge1	$23.25
Minimum quarterly charge2	$69.76
Per Ccf. over minimum monthly charge3	$3.73

Notes:

1. Includes first 3 Ccf.

2. Includes first 9 Ccf.

3. Ccf = 100 cubic feet of metered water used or metered wastewater discharge if provided in permit.

7. Effective July 1, 2026, sewer users with flow exceeding eight hundred million (800,000,000) gallons per year are eligible for the following rates:

Minimum monthly charge	$23.25 (includes first Ccf.)
Per Ccf. over minimum monthly charge	$2.984

(Ccf = 100 cubic feet of metered water used or metered wastewater discharge if provided in permit) Rates will be increased by the same applicable amount that rates under subsection A6 of this section are increased.

(Ord. 4261, 10-6-1997; amd. Ord. 4482, 5-29-2001; Ord. 4699, 6-14-2004; Ord. 5091, 1-30-2012; Ord. 5287, 6-8-2015; Ord. 5472, 11-13-2018; Ord. 5558, 6-1-2020; Ord. 5603, 6-7-2021; Ord. 5645, 5-16-2022; Ord. 5702, 5-15-2023; Ord. 5769, 7-1-2024; Ord. 5796, 6-2-2025)

8-3A-3: CHARGES AND FEES:

A. Charges And Fees: The city may adopt charges and fees, which may include:

1. Fees for reimbursement of costs of setting up and operating the city's pretreatment program.

2. Fees for monitoring, testing, inspections and surveillance procedures.

3. Fees for reviewing accidental discharge procedures and construction.

4. Fees for permit applications.

5. Fees for filing appeals.

6. Fees to specific contributing industrial users for consistent removal, by the city, of pollutants otherwise subject to federal categorical pretreatment standard.

7. Other fees as the city may deem necessary to carry out the requirements contained herein.

These fees relate solely to the matters identified above and are separate from all other fees chargeable by the city.

B. City's Scheduling Of Charges And Fees:

1. A surveillance monitoring fee of three hundred fifty dollars ($350.00) per installation of equipment shall be assessed against each user for which the city, rather than the user, installs surveillance monitoring equipment for the purpose of conducting wastewater sampling.

2. A sampling fee of one hundred thirty dollars ($130.00) per site visit for the purpose of wastewater sample collection shall be assessed against each user.

3. Fees for investigating accidental discharges shall be based on the time expended at twenty three dollars ($23.00) per hour.

4. Laboratory testing fees shall be based on actual expenses incurred for each parameter tested as specified in a fee schedule which the city shall approve and issue from time to time.

5. A wastewater discharge permit application fee shall be assessed each request for a wastewater discharge permit in the amount of twenty five dollars ($25.00). Wastewater discharge permit and/or permit renewal shall be assessed in the amount of two hundred dollars ($200.00). An additional fee shall be assessed in the amount of one hundred dollars ($100.00) for past due applications.

6. An appeal filing fee shall be assessed in the amount of one hundred dollars ($100.00). (Ord. 4261, 10-6-1997)

8-3A-4: CONNECTION CHARGES:

8-3A-4-1: BUILDING SEWER CONNECTION CHARGES; DETERMINATION:

The charge for making connection to an existing public sewer in the near vicinity of a property for which it is desired that service be provided shall be determined as follows:

A. Where the property to be served has been specifically assessed for the sewer facilities prior to the time of the application for connection, there shall be no additional connection charge, unless at the time of assessment a deficiency was allowed. Then, the sewer connection charge shall be equal to the deficiency previously allowed.

B. Where the property to be served has not been assessed or is not subject to an assessment of a special tax for the construction of the sewer facilities to which connection is sought and said sewer was built through assessments, the connection charge shall be equal to the average front footage charge assessed to all property on the sewer involved applied to the front footage of the property to be served. Where the property has frontage on two (2) intersecting streets, the footage to which the charge shall be applied shall be the one considered the front in all usual proceedings for assessments. Where unusual parcel shape would make the charge inequitable to the owner or to the city, the frontage shall be taken as the lot width at the face of the building.

C. Where the property to be served has not been subject to assessment for the cost of the public sewer, constructed before January 1, 1978, and the cost thereof was paid by general taxation, the sewer connection charge shall be calculated on the basis of five dollars fifty cents ($5.50) per front foot of actual lot frontage, as hereinabove defined, plus fifty dollars ($50.00) hookon.

D. Where the property to be served has not been subject to assessment for the cost of the public sewer constructed after January 1, 1978, and before January 1, 1982, and the cost thereof was paid by general taxation, the sewer connection charge shall be calculated on the basis of fifteen dollars ($15.00) per front foot of actual lot frontage as hereinbefore

defined or the actual front footage construction cost (including engineering, real and administrative charges) whichever charge is lesser, plus a hookon charge in the amount of two hundred dollars ($200.00) per acre prorated to lesser portions of an acre with a minimum hookon charge of fifty dollars ($50.00) per hookon.

E. Where the property to be served has not been subject to assessment for the cost of the public sewer constructed after January 1, 1982, and the cost thereof was paid by general taxation, the sewer connection charge shall be calculated on the basis of the actual front footage construction cost (including engineering, real and administrative charges), plus a hookon charge in the amount of two hundred dollars ($200.00) per acre prorated to lesser portions of an acre with a minimum hookon charge of fifty dollars ($50.00) per hookon. (Ord. 4261, 10-6-1997)

F. The subject matter of this section is legally described as follows:

Property lying within the North One-half (1/2) of the Northwest Quarter (1/4) of Section 14, Township 88, Range 13 West, City of Waterloo, Black Hawk County, Iowa, except right-of-way of E. Shaulis Road and Hammond Avenue (hereinafter "described property").

All "described property" not currently assessed for the cost of the public sewer which proposes to be served by the public sewer or any extension of the public sewer shall be assessed a hookon charge at the rate of one thousand one hundred twenty four dollars sixty seven cents ($1,124.67) per acre. This hookon charge shall be paid in full by the developer in lump sum within thirty (30) days of the city council's acceptance of a subdivision final plat that is within the "described property". The areas to be used for calculating the hookon fee shall include the entire area of the subdivision, including street rights of way, and any included or adjoining areas not used for residential or commercial development, including, without limitation, ponds, lakes, and parks. Any area not included in a subdivision final plat but that is a part of the "described property" and which proposes to hook on to the public sewer or any extension of it shall, at the time the property owner or user applies to hook on to the public sewer or any extension of it, pay in full any lump sum it owes to hook on to the public sewer or any extension of it. Hookon charges for unplatted areas shall be determined by the size of the entire parcel being served.

G. The provisions of the hookon charge provided for in this section shall not apply to any property covered by a specific hookon charge ordinance. (Ord. 4469, 4-16-2001)

8-3A-4-2: CROSS AND LATERAL SEWER CONNECTION CHARGES:

Before a permit for a new cross or lateral sewer connection to a main sewer shall be granted, the applicant shall have complied with the terms and conditions for such connection established by the city council. Such terms and conditions may include, but not be limited to, engineering design, construction standards, requirements for inspection of construction of the applicant's sewer, and the setting of equitable fees to be paid for the right to connect to public sewer and all facilities to which the sewer will be contributory. (Ord. 4261, 10-6-1997)

8-3A-4-3: USE OF SEWER CONNECTION CHARGES:

Such charges shall be due without regard to whether the facilities involved, trunk sewers or POTW have been paid for in full or whether prior assessments and other resources will cover all costs for such facilities. Connection charges shall be deemed a refund of amounts yet to be or previously paid by the city from its funds for the additional service made available to the applicant. (Ord. 4261, 10-6-1997)

8-3A-4-4: PERMITTED CONNECTIONS:

No building sewer connection shall be made to a public sanitary sewer which is not in front of the property to be served unless the public sewer cannot feasibly be extended and the building sewer can be connected without creating difficulties for other utilities in the street or unless any such difficulties are offset by a definite public advantage in having the connection. No building sewer shall be connected directly into a manhole more than six inches (6") above the flow line therein. Where a public sewer is extended by an applicant at his own expense, it shall be constructed in accordance with the specifications of the city for public sewers and connection charges may be reduced by the cost thereof, in whole or in part. (Ord. 4261, 10-6-1997)

8-3A-4-5: VIOLATIONS AND PENALTIES:

Any person which shall make a connection without paying connection charges due under this section 8-3A-4 or in any manner violate the other terms of this section 8-3A-4 shall be, upon conviction, deemed guilty of a misdemeanor and subject to fine and imprisonment as provided by law. (Ord. 4261, 10-6-1997)

MONTHLY BILLING PROCESS CHANGES

CITY OF WATERLOO IOWA
Community of Opportunity

Monthly Water Billing Change

- **Iowa Code Section 388.6 prohibits city utilities and combined utility systems from charging discriminatory rates. The only exception is for service provided to the city itself or its agencies, as outlined in section 384.91. (noted below)**
- **Core Rule:** No unfair or different pricing for similar utility users.
- **The Exception:** Special rates or free service are allowed for the local city government and its agencies under Iowa Code Section 384.91 guidelines.
- **Applies To:** City-owned water, gas, electric, or combined municipal utility systems.

384.91 City to pay for services.
The city shall pay for the use of or the services provided by the city utility, combined utility system, city enterprise, or combined city enterprise as any other customer, except that the city may pay for use or service at a reduced rate or receive free use or service so long as the city complies with the provisions, terms, conditions and covenants of any and all resolutions pursuant to which revenue bonds or pledge orders are issued and outstanding.

Waterloo Code For Water/Sewer Billing

Old Verbiage

1. The maximum quarterly rate shall be based on one hundred percent (100%) of water consumption during the winter quarter as recorded by the Waterloo Waterworks. For those users of water being billed on a monthly basis by the Waterloo Waterworks, the maximum monthly rate shall be based on one hundred percent (100%) of the monthly water consumption. Industrial users will be billed on actual water consumption unless otherwise approved by the Superintendent. Any special or private contracts shall be metered at the user's expense.

New Verbiage

8-3A-2: DETERMINATION OF RATES AND CHARGES:

Each connection to the POTW shall pay user charges in accordance with the following schedule:

1. The maximum monthly rate for residential accounts shall be based on one hundred percent (100%) of the monthly water consumption during the winter months as determined by Waterloo Waterworks. Industrial users will be billed on actual water consumption unless otherwise approved by the General Manager. Any special or private contracts shall be metered at the user's expense.

CITY OF WATERLOO IOWA

Community of Opportunity

COMMUNICATION TO THE WATERLOO CITY COUNCIL

NAME AND DEPARTMENT

Martin Petersen, City Attorney
Legal Department Department

MEETING DATE

September 8, 2026

AGENDA ITEM TITLE

Hearing and Order Assessing $1,500.00 civil penalty to Kwik Stop 3, 1104 Washington Street, Waterloo, Iowa, for sale of tobacco to minor, 2nd offense.

RECOMMENDED COUNCIL ACTION

Assess Penalty for Second Violation.

SUMMARY STATEMENT AND BACKGROUND INFORMATION

Kwik Stop 3 was contacted regarding a tobacco violation and given a deadline to acknowledge the violation. They did not respond and therefore, the Council must assess the civil penalty of $1500.00 for this violation.

NEIGHBORHOOD IMPACT

DATA, ANALYSIS, AND STRATEGIES

IMPLEMENTATION, ACCOUNTABILITY, AND COMMUNICATION

COMMUNITY ENGAGEMENT METHODS

SOURCE OF EXPENDITURES

ALTERNATIVE ACTION

LEGAL DESCRIPTION

ATTACHMENTS

1. kwik stop 3 washington tobacco 2nd offense

PLEDGE

Compliance Check Form
FY 2026

Retailer: Kwik Stop 3 Address: 1104 Washington st

City: W'Loo State: IA ZIP: 50702

Results (check one):

Date Checked: 6/30/26

Time Checked: 9558

Clerk Information: Male ☒ Female ☐

(Name (only required if Non-Compliant)

First Name: Abdul Middle Initial: —

Last Name: Shakoor Case #: W26-056078

☒ I have issued a criminal citation to the clerk listed above for selling tobacco, alternative nicotine or vapor products to a person under age twenty-one. Iowa Code § 453A.2(1).

Unable to Complete (not applicable) ☐

Compliant ☐

Non-Compliant ☒

If Unable to Complete the Compliance Check (check one)

☐ The establishment **has a valid permit, but does not sell** tobacco, alternative nicotine or vapor products.
Permit status verified by City Clerk or County Auditor.

☐ The establishment **no longer holds a valid Tobacco, Alternative Nicotine or Vapor Product Permit.**

☐ The establishment **is out of business.**

☐ The establishment **is designated as an "Unsatisfactory Condition".**
- "Unsatisfactory Condition" was verified by IDR PC/ Investigator.
- Officer conducted a walk-through of the premises.
- Explanation is required in Comments Section below.

If none of the above reasons apply, write the reason and explanation on the back of this form. See page 5 for a reason list.

: If the compliance check result is Non-Compliant, a citation must be issued before your department may receive payment.)

Officer Information (officer that conducted the compliance check)

First Name: Kejuan Middle Initial: E Last Name: Tucker

Badge: T3825 Department: WPD

Confidential Informant (CI)

CI Age: 16 ☐ 17 ☐ 18 ☒ 19 ☐ 20 ☐

CI Gender: Male ☐ Female ☒ **CI Number:** 4705 (Last 4 digits of CI's ID)

CI Race: White ☒ Asian/Pacific Islander ☐ Black ☐ American Indian/Alaskan Native ☐ Unknown ☐

CI Ethnicity: Not of Hispanic Origin ☒ Hispanic Origin ☐ Unknown ☐

Results of Attempted Purchase

Attempted Purchase Item:

Cigarettes ☐ Smokeless Tobacco ☐ Other Tobacco Product ☐ Vapor Product ☒ Alternative Nicotine Product ☐

Age Requested? Yes ☐ No ☒

ID Requested? Yes ☒ No ☐

Comments:
cool mint geek bar #16

Officer Signature **$75**

IN THE IOWA DISTRICT COURT IN AND FOR
BLACK HAWK COUNTY

This Complaint and Affidavit is to be:

☒ Filed with Court Clerk (cc: CA)
☐ Submitted to County Attorney
☐ Filed with JCO - Defendant is a Juvenile

Form Number: **W26-056078**
Arrest Date: **06/30/2026**

THE STATE OF IOWA

VS.

OFFENDER

Last	First	Middle	Suffix
SHAKOOR	ABDUL		

Address	City	State	Zip Code
2200 HAWTHORNE AVE	WATERLOO	IA	50702

DL#	State	DL Class	DL Endorsements	DL Restrictions
911AL8382	IA			

Date of Birth	Gender	Race	Ethnicity
01/01/1960	MALE	AMERICAN INDIAN/ALASKAN NATI	NOT OF HISPANIC ORIGIN - N

Height	Weight	Eye Color	Hair Color
5' 09"	189 LBS	BROWN - BRO	

OFFENSE

State	County	Local	Code Section	Crime Description	Speed	in Zone
☒	☐	☐	453A.2(1)	EMPLOYEE PROVIDING TOBACCO/VAPOR PRODUCT TO PERSO		

Class	Serious P.I.	Fatal Accident	Civil Damage Assessment	Other
SCHT	☐	☐	☐	☐

Location Type

Literal Description
1104 WASHINGTON STRET

Address	City	State	Zip Code
WASHINGTON	WATERLOO	IA	50702

Is Date and Time of Incident Known?	Incident Date or Low Range	Upper Date Range	Incident Time or Low Range	Upper Time Range
YES	06/30/2026		21:50	

STATUS OF OFFENDER/JUVENILE

☐ TAKEN INTO CUSTODY	CUSTODY	☒ SUMMONS TO APPEAR (Citation Issued)
☐ WARRANT REQUESTED	☐ NO CONTACT ORDER REQUESTED	☐ RELEASED TO PARENT/GUARDIAN

NARRATIVE

Narrative of Offense Committed

On or about the above stated date and time, the Defendant did

unlawfully sell, give or otherwise supply tobacco, tobacco products or cigarettes to a person under twenty one years of age by an employee of a retailer

SUMMONS

I promise to appear in said court at said time and place.

Signature of Defendant

Court Date **07/14/2026**

Court Time **1:30 PM**

In the Court At **BLACK HAWK COUNTY COURTHOUSE 316 EAST FIFTH STREET, WATERLOO 50703**

AFFIDAVIT

STATE OF IOWA, BLACK HAWK COUNTY

I, the undersigned, being duly sworn, state that all facts contained in this Complaint and Affidavit, known by me or told to me by other reliable persons form the basis for my belief that the defendant committed this crime

State all facts and persons relied upon supporting elements of alleged crime

On Tuesday June 30, 2026 Waterloo Police Department conducted tobacco compliance checks. We utilized an under age person to complete these checks. At 2150hrs Officer Tucker and I went to 1104 Washington Street with the underage person. The underage party entered the store with a $50.00 bill and made contact with the clerk (Defendant/Offender #1). They requested to purchase a cool mint geekbar vape which cost $16.00. The clerk failed to ask for age but did request and ID. The underage person provided their state ID which showed they were not the age of 21. The clerk proceed with the transaction. Officer Tucker stepped in and made contact with the clerk and obtained all of his information. The undercover person left the store and the $50.00 was given back to Officer Tucker. The clerk was charged with providing tobacco to a person under age and was given a summons to appear in court.

S K Bose

BOSE, STEVE **B3662**

Signature of Complainant or Officer, Officer Name & Number

STATE OF IOWA, BLACK HAWK COUNTY

NOTARIAL SEAL IOWA

Subscribed and sworn to before me by the person(s) signing the Complaint and Affidavit(s) on 06/30/2026

Notary Name

Signature of Verifying Party

Commission Number

My Commission Expires

☐ Peace Officer ☐ Notary ☐ Prosecuting Attorney

Rev. 12/2011

IOWA INCIDENT REPORT

WATERLOO POLICE DEPARTMENT

715 MULBERRY ST
WATERLOO , IA 50703
(319) 291-4340

Case Number	
W26-056078	
Date/Time of Report	
06/30/2026	21:54 Hrs
Status	
03 - CLEARED BY ARREST	

SUMMARY

County	Report Type	ORI Number
BLACK HAWK - 07	0 - INITIAL INCIDENT	IA0070300

Is Date and Time of Incident Known?	Incident Date or Lower Date Range	Upper Date Range	Incident Time or Lower Time Range	Upper Time Range
Yes	06/30/2026		21:50 Hrs.	Hrs.

Day of Week Incident Occurred	Exceptionally Cleared	Date Cleared Exceptionally
TUESDAY		

INCIDENT REPORTED BY

Was Incident Reported by a Victim?	Reporting Victim's Sequence No.	Name - Last	First	Middle	Suffix
NO		BOSE	STEVE		

Business Name (if Incident was Reported by a Business)	Address
	715 MULBERRY ST

City	State	Zip Code	Home/Cell Phone	Work Phone
WATERLOO	IA	50703		(319) 291-4340

OFFENSE 001

Seq. No.	Ordinance	Code Section	UCR Offense Code
001	STATE	453A.2(1)	ALL OTHER OFFENSES - 90Z

Charges/Offense	Attempted/Completed
EMPLOYEE PROVIDING TOBACCO/VAPOR PRODUCT TO PERSON UNDER 21-1ST OFF	C - COMPLETED

Type of Criminal Activity (up to 3)
B - BUYING/RECEIVING

Type of Weapon/Force Involved (up to 3)	Gang Information (up to 2)
99 - NONE	N

No. of Premises Entered	Method of Entry	Offender Suspected of Using (up to 3)
		N - NOT APPLICABLE

LOCATION OF OFFENSE

Location Type	X Coordinate	Y Coordinate
17 - LIQUOR STORE	554458.375	4704310

Literal Description
1104 WASHINGTON STRET

VICTIM 001

Type of Victim	Sequence No.	Business/Organization/State/County/Municipality Name
S - SOCIETY/PUBLIC	001	

Address	City	State	Zip Code	Phone

VICTIM CONNECTED TO UCR OFFENSE CODES

UCR Offense Code 1: ALL OTHER OFFENSES - 90Z	UCR Offense Code 2
UCR Offense Code 3	UCR Offense Code 4
UCR Offense Code 5	UCR Offense Code 6
UCR Offense Code 7	UCR Offense Code 8
UCR Offense Code 9	UCR Offense Code 10

ADDITIONAL OFFENSE CIRCUMSTANCE INFO

Aggravated Assault/Homicide Circumstances (up to 2)

Additional Justifiable Homicide Circumstances

END OFFENSE 001

OFFENDER 001

Type of Offender	Sequence No.	NIBRS Offense Sequence Numbers	Lesser Offense Sequence Numbers
01 - Offender	001	001	

Name - Last	First	Middle	Suffix
SHAKOOR	ABDUL		

Alias(es)

Address	City	State	Zip Code	Home Phone
2200 HAWTHORNE AVE	WATERLOO	IA	50702	

DOB Known?	DOB	Age or Lower Age Range	Upper Age Range	SSN	Resident Status
YES	01/01/1960	66		395-49-0308	R - RESIDENT

Driver's License - Number	State	Gender	Height	Weight	Eye Color	Hair Color
911AL8382	IA	M - MALE	5' 09"	189 LBS	BROWN - BRO	BLACK - BLK

Skin Tone	Race	Ethnicity
MEDIUM - MED	I - AMERICAN INDIAN/ALASKAN NATIVE	N - NOT OF HISPANIC ORIGIN

Scars/Marks/Tattoos	Offender Present When Officer Arrived?
	YES

Type of Injury (up to 5)
N - NONE

EMPLOYMENT OR SCHOOL INFO

Employer or School	Occupation
KWIK STOP 3	CLERK

Address	City	State	Zip Code	Work Phone
1104 WASHINGTON	WATERLOO	IA	50702	

ARREST INFO

Offender Arrested?	Arrest Trans. Booking No.	Type of Arrest	Arrest Date	Arrest Time
YES	0	O - ON-VIEW ARREST	06/30/2026	21:54 Hrs.

Associated Offense Sequence No.	Miranda By	Miranda Date	Miranda Time
001			Hrs.

Arrestee Condition	Arrestee Armed With (up to 2)
S - SOBER	01 - UNARMED

Place of Birth	Multiple Arrestee Indicator	Additional Incidents Cleared
	N - NOT APPLICABLE	

JUVENILE INFO

Parent/Guardian Contacted?	Name - Last	First	Middle	Suffix

Address	City	State	Zip Code

Home Phone	Work Phone	Juvenile Arrestee Disposition

END OFFENDER 001

OFFICER'S INVESTIGATIVE NOTES

On Tuesday June 30, 2026 Waterloo Police Department conducted tobacco compliance checks. We utilized an under age person to complete these checks. At 2150hrs Officer Tucker and I went to 1104 Washington Street with the underage person. The underage party entered the store with a $50.00 bill and made contact with the clerk (Defendant/Offender #1). They requested to purchase a cool mint geekbar vape which cost $16.00. The clerk failed to ask for age but did request and ID. The underage person provided their state ID which showed they were not the age of 21. The clerk proceed with the transaction. Officer Tucker stepped in and made contact with the clerk and obtained all of his information. The undercover person left the store and the $50.00 was given back to Officer Tucker. The clerk was charged with providing tobacco to a person under age and was given a summons to appear in court.

OFFICER

Complainant/Reporting Party Signature

Reporting Officer	Badge Number	Supervisor	Badge Number
BOSE, STEVE	B3662		

Video Taken? (Check All That Apply)	Evidence Seized?	Photos Taken?
04 - BODY CAMERA	NO	NO

Incident Assigned To
NONE