OPN ARCHITECTS

HSS ANK IMEO EXPANSION & RENOVATION – ADDENDUM 02

Date: December 5, 2025

Project: HSS ANK IMEO Expansion & Renovation

State of Iowa project number: 9429.00

Client: Iowa Department of Administrative Services

Project Location: 2250 S Ankeny Blvd, Ankeny, Iowa 50023

This Addendum forms a part of the contract documents and modifies the original bidding documents dated November 13, 2025 as noted below. Acknowledge receipt of this Addendum in the space provided on the bid form. Failure to do so may subject the bidder to disqualification.

To: Bidders

Contents: (12) Attached Typed Pages
(23) Drawing Sheets
(184) Specification Pages

BIDDING QUESTIONS & ANSWERS

QUESTION #1:
Could you clarify whether the Downdraft Autopsy Station is provided as a fully integrated assembly—complete with faucets, spray hoses, disposals, wall grilles, internal piping, and factory-installed components—requiring only single-point utility connections by the mechanical contractor? Or should we assume that these individual accessories, components, and any associated internal infrastructure will be shipped loose and require field installation, fitting, and coordination by the mechanical contractor?

Please provide all applicable submittal documentation, installation requirements, detailed connection points, and any special coordination provisions so that all parties can accurately account for the full extent of required labor and materials.

ANSWER #1:
The autopsy stations are provided as a fully integrated assembly from the Mfr.

QUESTION #2:
Could you clarify whether the Backdraft Autopsy Station is provided as a fully integrated assembly—complete with faucets, spray hoses, disposals, wall grilles, internal piping, and factory-installed components—requiring only single-point utility connections by the mechanical contractor? Or should we assume that these individual accessories, components, and any associated internal infrastructure will be shipped loose and require field installation, fitting, and coordination by the mechanical contractor?

Please provide all applicable submittal documentation, installation requirements, detailed connection points, and any special coordination provisions so that all parties can accurately account for the full extent of required labor and materials.

ANSWER #2:
The autopsy stations are provided as a fully integrated assembly from the Mfr. Refer to attached images as reference.

Answer #2 Reference Images:

QUESTION #3:
Can you confirm the edge detail and grid profile needed for ACP-4? It is generally not recommended for square edge tiles to be paired with narrow 9/16'' grid, due to possible shifting and a higher chance of visible gaps.

ANSWER #3:
Comment acknowledged and grid for ACP-4 will be changing to USG Donn DX/DXL 15/16'' Grid in Addendum 02.

QUESTION #4:
Specification 23 21 13.13 indicates that the underground hydronic (condenser water) piping is to be fiberglass with tapered bell-and-spigot ends for adhesive joints (Section 2.02). However, the Piping Application section (3.02) lists the joints as either adhesive or flanged. In contrast, Drawing M502 (HVAC Piping and Insulation Schedule) identifies fiberglass piping with grooved joints, and Note 1 specifies that push-to-connect/push-on connections are not permitted.

Please clarify the required material and joint type for the underground hydronic piping.

ANSWER #4:
Fiberglass piping with bell-and-spigot adhesive-bonded connections is correct. This has been addressed via Addendum 2 in the specification section and the HVAC Piping and Insulation Schedule.

QUESTION #5:
Specification 23 21 13.13, Part 3.02 specifies loose-fill insulation, while the schedule on drawing M502 indicates PVC jacketing. These two insulation methods are not compatible. Please clarify the required insulation specification for the underground hydronic piping.

ANSWER #5:
There will be no insulation for underground condenser water piping. This has been addressed via Addendum 2 in the specification section and the HVAC Piping and Insulation Schedule.

QUESTION #6:
There is no piping shown for TAB-B350 on drawing M102. The schedule, M500, indicates this has a hot water coil in TAB-B350. Please provide a drawing showing where this piping is coming from and what the sizing should be.

ANSWER #6:
Piping has been added via Addendum 2 on sheet M102.

QUESTION #7:
On Drawing M102 there is a note stating "Provide temporary cooling as required for down time to transition from exiting to new condensing units". Drawing M103 has a note stating "Provide refrigerated truck as required for down time to relocate condensing units". Are these notes for the same thing? Who is providing the temporary cooling units? Who is providing a refrigerated truck? What are the requirements/specifications for these 2 items? Can this work be staged so temporary units are not required? Please provide clarification for this work.

ANSWER #7:
Notes have been revised on the roof plan and penthouse plan to state that the contractor is responsible to provide any temporary cooling as required.

QUESTION #8:
Are as-builts of the existing system available for reference in the existing portion of Building B?

ANSWER #8:
As-builts can be provided to the awarded contractor. Currently the fire protection as-built drawings show the main location routing up from the basement through the east chase and routing of the main in the basement tunnel below. The as-builts for Building B show the hazard types the existing system was designed for. It is unknown if existing shop drawings are available for reference.

QUESTION #9:
Specifications don't mention flexible drop connections (such as Victaulic AH2 attached), will these be permitted to be used?

ANSWER #9:
Yes, construction documents will be updated in Addendum 02 to allow flexible drop connections.

QUESTION #10:
Note 1 states the owner will have ICN provide and terminate jacks for all data cabling.

ANSWER #10:
Yes, ICN will terminate jacks and terminate cabling. Pathways and pulling cable to be by Bid Package 026A.

QUESTION #11:
The Spec book is saying to provide a 25-year warranty for the cabling system under Division 27 00 00 1.11 C. Will the warranty be handled by ICN?

ANSWER #11:
Yes, the warranty will be covered by ICN. Data cabling warranty requirements have been removed from the specifications.

QUESTION #12:
Basepoint is to provide the Camera system, do we need to carry that cost in our bid?

ANSWER #12:
Basepoint allowance is to be included in Bid Package 026A. Pathways and pulling cable to be by Bid Package 026A.

QUESTION #13:
Basepoint is to provide the Access Control system, do we need to carry that cost in our bid?

ANSWER #13:
Basepoint allowance is to be included in Bid Package 026A. Pathways and pulling cable to be by Bid Package 026A.

QUESTION #14:
Distributed Antenna System: I do not see this system listed in the Responsibility matrix on Drawing T000. Is this system to be included in the bid?

ANSWER #14:
This scope of work for the Distributed Antenna System is shown on the fire alarm drawings, and it is part of Bid Package 026A.

QUESTION #15:
What are the expectations for VDC in the existing facility?

ANSWER #15:
Yes, VDC Modeling of new construction and construction in existing building at new ceiling & grid/framing work locations and MEP work showing tie-ins to existing systems. VDC Modeling also required for new systems below existing slab or in existing walls. Contractor shall field verify for their scope of work as early as possible without causing destructive demolition to the existing building. This will be clarified in Addendum 02.

OPN ARCHITECTS

SUBSTITUTION REQUESTS

1. APPROVED
    a. 03 54 00 – Maxxon; Level EZ
    b. 05 51 33 – O'Keeffe's Inc; Access Ladder
    c. 07 05 43 – Cladiator; Slotted Z
    d. 07 05 43 – Exo Girt; Z Girts
    e. 07 05 43 – Knight Wall Systems MFI
    f. 07 27 00 – Dow; DEFENDAIR 200C
    g. 07 27 00 – TK Products; AirMax 2104VP
    h. 07 42 13 – Peterson Pac Clad; 7.2 Panel
    i. 08 42 29 – Assa Abloy; Series SL500-NS
    j. 08 45 00 – Kingspan GridSpan
    k. 09 51 00 – Mars High NRC Panels #88137 for ACP-2
    l. 09 84 00 – MPS Acoustics; Custom Wave Baffles, approved for ACB-1
        i. Manufacturer approval contingent, product height, size, color, and configuration must match documents.
    m. 09 84 00 – MPS Acoustics; Joist Felt Ceiling Baffles for ACB-2
        i. Manufacturer approval contingent, product height, size, color, and configuration must match documents.
    n. 10 28 00 – Saniflow; Speedflow Plus M17ACS-UL
    o. 10 51 13 – LockersMFG
    p. 23 21 16 – American Wheatly, Hydronic Piping Specialties
    q. 23 52 16 – Camus, Condensing Boilers
    r. 23 21 23 – Wilo, Hydronic Pumps
    s. 26 32 13 – Cummins
    t. 26 32 13 – MTU
    u. Division 26 Approved Light Fixtures:

	Type	Manufacturer
i.	F6	ALVA, ASL, MODERNFORMS
ii.	F9	STARFIRE
iii.	F10	STARFIRE
iv.	F14	AXIS, LUX LUMINAIRE
v.	F18	MAXLITE
vi.	F22A	LA LIGHTING
vii.	F23B	LA LIGHTING
viii.	F23	STARFIRE
ix.	F24A	PRESCOLITE
x.	F24B	PRESCOLITE
xi.	F25	ASL
xii.	POLE	BEACON, LITHONIA
xiii.	W1	NLS LIGHTING

    v. 27 10 00 – Leviton Structured Cabling

i.	Category 6	Leviton LANmark-1000
ii.	Category 6A	Leviton SST

    w. 31 61 00 – Michels Construction

OPN ARCHITECTS

GENERAL INFORMATION & CLARIFICATIONS

1. Pre-Bid Meeting #2 Minutes and Attendees Log attached from meeting that occurred December 3, 2025 at 2:30pm.
2. A third Pre-Bid Meeting will be held on December 11th at 2pm at the same location as the previous two Pre-Bid Meetings. Spec section 00 11 13 updated as part of this Addendum.
3. For access to Civil CAD files from Snyder & Associates during bidding, please refer to the following link and searching the project solicitation number. Civil CAD files can also be accessed through Rapids Reproductions website.
    - https://bids.sciquest.com/apps/Router/PublicEvent?CustomerOrg=DASIowa
4. Bid Package Estimates provided for reference as part of Addendum 02.

GENERAL DRAWINGS & FRONT END SPECIFICATIONS

Front end specifications

1. 00 01 07 – VOLUME 1 – SEALS PAGE
    - **MODIFY** professional seals to provide signatures for construction set.
2. 00 02 07 – VOLUME 2 – SEALS PAGE
    - **CLARIFY** Volume 2 Seals Page number to 00 02 07.
    - **MODIFY** professional seals to provide signatures for construction set.
3. 00 02 10 – VOLUME 2 – TABLE OF CONTENTS
    - **CLARIFY** Volume 2 Table of Contents number to 00 02 10.
    - **CLARIFY** Volume 2 Seals Page number to 00 02 07.
    - **ADD** section 10 26 00 – Wall and Door Protection into Volume 2 Table of Contents.
    - **REMOVE** section 11 30 13 – Appliances from Volume 2 Table of Contents.
4. 00 03 07 – VOLUME 3 - SEALS PAGE
    - **CLARIFY** Volume 3 Seals Page number to 00 03 07.
    - **MODIFY** professional seals to provide signatures for construction set.
5. 00 03 10 – VOLUME 3 - TABLE OF CONTENTS
    - **ADD** section 23 07 16 – HVAC Equipment Insulation to Table of Contents. Section already present in Volume 3.
    - **CLARIFY** Volume 3 Table of Contents number to 00 03 10.
    - **CLARIFY** Volume 3 Seals Page number to 00 03 07.
6. 00 11 13 – NOTICE TO BIDDERS
    - **MODIFY** page numbering to correct sequence.
    - **MODIFY** paragraph 10 to add the date, time and location of the third pre-bid meeting.
7. 00 41 13.01 – NON-DISCRIMINATION CLAUSE
    - **MODIFY** specification number to match Table of Contents.
8. 00 41 13.02 – TARGETED SMALL BUSINESS INFORMATION
    - **MODIFY** specification number to match Table of Contents.
9. 01 12 00.006A – GENERAL CONSTRUCTION
    - **MODIFY** paragraph 3.4.
    - **MODIFY** paragraph 2.9.12 to remove garage entry pedestal and foundation from scope.
    - **ADD** paragraph 5.5 for VDC clarification.
10. 01 12 00.021A – FIRE PROTECTION
    - **ADD** paragraph 5.5 for VDC clarification stating:
        - *Contractor understands that the expectation is VDC Modeling of new construction and construction in existing building at new ceiling & grid/framing work locations and MEP work showing tie-ins to existing systems. VDC Modeling also required for new systems below existing slab or in existing walls. Contractor shall field verify for their scope of work as early as possible without causing destructive demolition to the existing building.*

11. 01 12 00.022A – MECHANICAL (HVAC, PLUBMING, & BAS)
    - **ADD** paragraph 2.4.25.
    - **MODIFY** paragraph 2.3.8 for temporary media.
    - **ADD** paragraph 2.4.26 to note Siemens allowance to be included.
    - **MODIFY** line 2.4.2 for equipment hookup.
    - **ADD** paragraph 5.5 for VDC clarifications.
12. 01 12 00.026A – ELECTRICAL (FIRE ALARM, STRUCTURED CABLING, SECURITY/ACCESS CONTROL, & AV)
    - **ADD** paragraph 2.2.43.
    - **ADD** paragraph 2.4.6 to note Basepoint allowance to be included.
    - **MODIFY** paragraph 2.5.3 for dual height pedestal.
    - **MODIFY** paragraph 2.2.6 for equipment hookup.
    - **ADD** paragraph 5.5 for VDC clarifications.
13. 01 21 00 – ALLOWANCES
    - 3.03 – A – 1
        - **MODIFY** paragraph to state:
            - *Provide products as specified in **Division 23**, and as shown on the Drawings.*
14. 01 33 00 – SUBMITTAL PROCEDURES
    - 3.03 – H
        - **MODIFY** paragraph to state:
            - *Contractor shall proactively procure submittals upon receipt of a Notice of Intent (NOI) for the project. Contractor can begin uploading submittals to ProCore once the NOI is issued. Submittals shall be uploaded to ProCore within three (3) weeks of receiving an executed prime contract. Construction Manager will coordinate with the Architect and other Design Consultants to prioritize review of submittals. Contractor shall clearly communicate associated lead times for each submittal to aid in prioritizing review. Contractor understands the submittal workload must be leveled and therefore other submittals may receive a higher priority and be processed ahead of Contractor's submittals. Quality submittals are expected and the Construction Manager, Architect & Design Consultants reserve the right to return a submittal without review if it is deemed low quality or too incomplete to warrant reviewing. The review period for each submittal shall not exceed three (3) working weeks. Only one (1) resubmittal will be accepted, with a review period not to exceed two (2) weeks from the date of receipt. If it is anticipated that the submittal process may require multiple resubmittals, the Construction Manager (CM) and designer shall conduct a page-turn review with the contractor and relevant suppliers following completion of the initial submittal review to expedite the process and ensure full alignment prior to the first resubmittal.*
15. 01 35 46 – INDOOR AIR QUALITY
    - 1.05 – A – 4
        - **MODIFY** paragraph to state:
            - *If permanently installed **new or existing** air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-2017. Replace filtration media immediately prior to occupancy, according to Division 23 - HVAC.*
    - 3.01 – G – 3
        - **MODIFY** paragraph to state:
            - *If **new or existing** permanent building HVAC systems are used to supply the ventilation air, provide filtration media **at each return grille** with a Minimum Efficiency Reporting Value (MERV) of 8 as determined by ASHRAE 52.2 during construction. Coordinate with work of Division 23 (15), Heating Ventilating and Air Conditioning (HVAC). Fresh clean filters must be installed immediately prior to occupancy in accordance with Division 23 - HVAC.*

16. 01 77 00 – CLOSEOUT PROCEDURES
    - **MODIFY** page numbering to correct sequence for Substantial Completion Project Checklist.

General drawings

1. G001 – INDEX & SEALS
- **MODIFY** professional seals to provide signatures for construction set.

ARCHITECTURAL

Architectural clarifications

1. **CLARIFY** Ceiling Types Legend on Sheets A102, A151, A400, A401, A402, A403, A404, A405, A406, A407, A408, A409, A410 to state the following for ACP-4 Ceiling Type Grid:
    i. *Grid: USG Donn DX/DXL 15/16''*

Architectural specifications

1. 03 54 00 – CAST UNDERLAYMENT
    - 2.01 – A – 2
        i. **ADD** Maxxon Level EZ as an approved manufacturer.
2. 05 51 33 – METAL LADDERS
    - 2.03 – F – 4
        i. **ADD** O'Keeffe's Inc as an approved manufacturer.
3. 07 05 43 – CLADDING SUPPORT SYSTEMS
    - 2.05 – A – 7 – c
        i. **ADD** Knight Wall Systems MFI as an approved manufacturer.
    - 2.05 – A – 7 – d
        i. **ADD** Cladiator; Slotted Z as an approved manufacturer.
    - 2.05 – A – 7 – e
        i. **ADD** Exo Girt; Z Girts as an approved manufacturer.
4. 07 27 00 – AIR BARRIERS
    - 2.01 – B – 6
        i. **ADD** Dow; DEFENDAIR 200C as an approved manufacturer.
    - 2.01 – B – 7
        i. **ADD** TK Products; AirMax 2104VP as an approved manufacturer.
5. 07 42 13 – METAL WALL PANELS
    - 2.01 – B – 4
        i. **ADD** Peterson Pac Clad; 7.2 Panel as an approved manufacturer.
    - 2.02 – B – 5
        i. **MODIFY** paragraph to state: "Panel depth: *1-1/4 inches and 6 inches where shown on drawings.''*
6. 08 42 29 – AUTOMATIC ENTRANCES
    - 2.01 – A – 2
        i. **ADD** Assa Abloy; Series SL500-NS as an approved manufacturer.
    - 2.03 – B
        i. **MODIFY** paragraph to state: Framing Members: *"Provide manufacturer's standard extruded aluminum framing with stainless steel cladding, reinforced as required to support imposed loads."*

- **2.**03 – C
    i. **MODIFY** paragraph to state: *"Door and Sidelight Construction: Heavy duty interlocked extruded aluminum tubular stile and rail sections with stainless steel cladding, through-rod bolted construction with steel corner support at hinge stile of carrier-suspended swinging panels or mechanically fastened corners with welded reinforcing brackets to reduce sag in sliding or breakout mode."*

7. 08 45 00 – TRANSLUCENT ROOF ASSEMBLIES
    - 2.03 – E
        i. **MODIFY** U-Factor requirement to 0.23.
    - 2.01 – A – 2
        i. **ADD** Kingspan Gridspan as an approved manufacturer.
    - 2.02 – A – 3
        i. **ADD** paragraph to state: ''*Manufacturer's thermally broken system."*
    - 2.05 – A – 1 – a
        i. **MODIFY** paragraph to state: "*Manufacturer's insulation to achieve U-Factor.''*
8. 09 51 00 – ACOUSTICAL CEILINGS
    - 2.02 – C – 9 – b
        i. **ADD** USG Mars High NRC 88137 Panels as an approved manufacturer.
    - 2.03 – B – 6 – a
        i. **CLARIFY** ACP-2 for ceiling grid type.
    - 2.03 – B – 6 – b
        i. **ADD** USG Donn Brand DX/DXL 15/16 inch Acoustical Suspension System for ACP-4.
9. 09 84 00 – ACOUSTICAL DECORATIVE PANELS
    - 2.01 – B – 4
        i. **MODIFY** paragraph add MPS Acoustics as an approved manufacturer and indicate approved products.
10. 10 26 00 – WALL AND DOOR PROTECTION
    - **ADD** section into Volume 2 of the specifications.
11. 10 28 00 – TOILET, BATH, AND LAUNDRY ACCESSORIES
    - 2.06 – A – 5 – b
        i. **ADD** Saniflow; Speedflow Plus M17ACS-UL as an approved manufacturer.
12. 10 51 13 – METAL LOCKERS
    - 2.01 – A – 8
        i. **ADD** LockersMFG as an approved manufacturer
13. 11 30 13 – APPLIANCES
    - **REMOVE** specification section from Volume 2.

Architectural drawings

1. A011 – PUMP HOUSE & DETAILS
    - H7
        i. **MODIFY** location of roof hatch where shown to coordinate with Mechanical/Plumbing.
2. A402 – ENLARGED PLAN & RCP -LOCKER RM / IMAGING & LOBBY / ADMIN SUITE
    - Keynote Legend
        i. MODIFY legend with updated keynotes.
    - A1
        i. **CLARIFY** locker types to indicate which are accessible with the ''A'' designation.
        ii. **CLARIFY** bench keynotes to match correct specification section.
3. A405 – ENLARGED PLAN & RCP – SOUTH OFFICES & LAB
    - Keynote Legend
        i. MODIFY legend with updated keynotes.
    - B1
        i. **CLARIFY** bench keynotes to match correct specification section.

4. A503 – INTERIOR ELEVATIONS
    - Keynote Legend
        i. MODIFY legend with updated keynotes.
    - J1
        i. **CLARIFY** locker types to indicate which are accessible with the ''A'' designation.
        ii. **CLARIFY** bench keynotes to match correct specification section.
    - J15
        i. **CLARIFY** locker types to indicate which are accessible with the ''A'' designation.
        ii. **CLARIFY** bench keynotes to match correct specification section.
    - P6
        i. **CLARIFY** locker types to indicate which are accessible with the ''A'' designation.
        ii. **CLARIFY** bench keynotes to match correct specification section.
    - P19
        i. **CLARIFY** locker types to indicate which are accessible with the ''A'' designation.
        ii. **CLARIFY** bench keynotes to match correct specification section.
5. A701 – EQUIPMENT PLAN – MAIN LEVEL
    - A1
        i. **CLARIFY** locker types to indicate which are accessible with the ''A'' designation.

CIVIL

Civil clarifications

1. No items at this time.

Civil specifications

1. No items at this time.

Civil drawings

1. No items at this time.

STRUCTURAL

Structural clarifications

1. No items at this time.

Structural specifications

1. No items at this time.

Structural drawings

1. S001 – STRUCTURAL NOTES
    - **REVISE** Foundation parameters note FP1 to indicate geotechnical EOR as Terracon
    - **REVISE** Foundation parameters note FP2 to indicate allowable soil bearing pressure of aggregate piers as 5,000 psf.
2. S101B – FOUNDATION PLAN
    - **REMOVE** countertop support from Imaging room located along grid BC.5
    - **ADD** additional callouts for detail 5/S202 (countertop supports) for clarification.

LABORATORY

Laboratory clarifications

1. No items at this time.

Laboratory specifications

1. No items at this time.

Laboratory drawings

1. No items at this time.

FIRE PROTECTION

Fire Protection clarifications

1. No items at this time.

Fire Protection specifications

1. 21 13 13 – WET PIPE SPRINKLER SYSTEMS
   - **ADD** Item E to part 2.07 Sprinkler Specialty Pipe Fittings.

Fire Suppression drawings

1. No items at this time.

PLUMBING

Plumbing clarifications

1. Specification section 23 21 13.13 was previously before specification section 23 21 13. Reorder 23 21 13 to be before 23 21 13.13 to match Table of Contents.

Plumbing specifications

1. No items at this time.

Plumbing drawings

1. No items at this time.

MECHANICAL

Mechanical clarifications

1. No items at this time.

Mechanical specifications

1. 23 21 13.13 – UNDERGROUND HYDRONIC PIPING
    - **REVISE** Item A of part 3.02 Piping Application to say the following: “Refer to the HVAC Piping and Insulation Schedule on the drawings.”

Mechanical drawings

1. MD101 – MECHANICAL DEMOLITION – MAIN LEVEL - ADDITION
    - **ADD** note to remove condensing unit pad.
2. MD104 – MECHANICAL PIPING DEMOLITION – RENOVATION
    - **MODIFY** piping as indicated.
3. M001 – MECH SITE PLAN
    - **MODIFY** notes as indicated.
4. M101A-N – HVAC PLAN – MAIN LEVEL - ADDITION
    - **MODIFY** ductwork and notes as indicated.
    - **MODIFY** location of DDC TEMP SENSOR in IDF B194.
    - **ADD** REF lines from SSI-1 up through roof to SSO-1.
    - **MODIFY** location of TSTAT for TAB B199.
    - **ADD** DDC controls override button for Main Autopsy B150.
    - **ADD** RG-2(s) above Storage B170 door.
5. M102 – HVAC PLAN – PENTHOUSE PLAN
    - **ADD** 1” HWS/HWR to serve TAB B350.
    - **MODIFY** notes for temporary cooling as indicated.
6. M103 – HVAC PLAN – ROOF PLAN
    - **ADD** refrigerant piping as indicated.
    - **MODIFY** notes for temporary cooling as indicated.
7. M302 – MECHANICAL DETAILS
    - **MODIFY** piping as indicated.
8. M500 – MECHANICAL SCHEDULES
    - **MODIFY** schedules as indicated.
9. M501 – MECHANICAL SCHEDULES
    - **MODIFY** schedules as indicated.
10. M502 – MECHANICAL SCHEDULES
    - **MODIFY** schedules as indicated.
11. MH101A – PIPING MAIN LEVEL – ADDITION
    - **MODIFY** location of main valves as indicated.
12. MH101B – PIPING MAIN LEVEL – RENOVATION
    - **MODIFY** piping to TAB B145 as indicated.
13. MH101B(ALT) – PIPING MAIN LEVEL – RENOVATION (ALTERNATE)
    - **MODIFY** piping to TAB B145 as indicated.

ELECTRICAL

Electrical clarifications

1. No items at this time.

Electrical specifications

1. No items at this time.

Electrical drawings

1. E601 – ELECTRICAL SCHEDULES
    - **MODIFY** F6 CCT to 3000K to match model number.
    - **MODIFY** F14 model number to be 4" aperture to match existing opening, regressed type 1, perimeter room fill distribution.
    - **ADD** note to F14 fixture description: "LENGTH TO BE FIELD VERIFIED WITH WALL-TO-WALL INSTALLATION TO MATCH EXISTING OPENING".
    - **ADD** note for F8 & F9 that custom color should be titanium silver by Focal Point, any approved manufacturer to match hex code.
    - **DELETE** PROLITE as approved manufacturer for F4.
    - **MODIFY** fixture F20 to have no substitutions and allowance of $4200.
    - **ADD** note at bottom of lighting fixture schedule for information about allowance request. Note states contractors include all costs associated with installation of lighting fixtures. Allowance listed includes lamps, distributor mark-up, and freight for delivery to job-site.
    - **ADD** approved manufacturer's as shown.

TECHNOLOGY

Technology clarifications

1. No items at this time.

Technology specifications

1. 27 00 00 – GENERAL REQUIREMETS FOR COMMUNICATIONS SYSTEMS
    - **DELETE** section 1.11C regarding the data cabling warranty. Due to ICN terminating and testing all data cabling the warranty will have to be provided by them.
2. 27 10 00 – STRUCTURED CABLING
    - **ADD** Leviton as an approved manufacturer for Cat6 and Cat6A cabling.

Technology drawings

1. T000 – TECHNOLOGY COVER SHEET
    - **MODIFY** Technology Responsibility Matrix to show wireless access points as being owner provided, contractor installed.

ATTACHMENTS:

- Typed Pages
  - Pre-Bid Meeting #2 meeting minutes & attendance list (11 pages)
  - Bid Package Estimates (1 page)
- Drawings
  - G001; S001; S101B; A011; A402; A405; A503; A701; MD101; MD104; M001; M101A-N; M102; M103; M302; M500; M501; M502; MH101A; MH101B; MH101B(ALT); E601; T000
- Specifications
  - 000107; 000207; 000210; 000307; 000310; 001133; 004113.01; 004113.02; 011200.006A; 011200.022A; 011200.026A; 012100; 013300; 013546; 017700; 035400; 055133; 070543; 072700; 074213; 084229; 084500; 095100; 098400; 102600; 102800; 105113; 211313; 232113.13; 270000; 271000

END OF ADDENDUM 02

State of Iowa - Department of Administrative Services
109 SE 13th St.
Des Moines, Iowa 50319
P: (515) 281-7260

Project: 9429.00 HHS ANK IMEO Expansion and Renovation
2250 S Ankeny Blvd
Ankeny, Iowa 50023
P: (515) 725-1400

RFB Pre-Bid Minutes: Meeting #2

Meeting Date	Dec 3, 2025	**Meeting Time**	02:30 pm - 04:30 pm Central Time (US & Canada)
Meeting Location	IMEO, 2250 S. Ankeny Blvd, Ankeny IA 50023, Rooms 207 & 208		
Overview	Meeting to allow prospective bidders to visit the site, when possible, and learn more about the project.		
Notes			
Attachments			

Scheduled Attendees

Introduction

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
1.1	1	Introductions				Open

Description
Welcome

Project Team Introductions:

- CM - Weitz
- Owner - DAS, CCM & IMEO
- Architect - OPN
- Design Consultants

Housekeeping Items:

- Weitz Sign-in Sheet
- Site Visit Form (Required to bid on BP's with mandatory pre-bid attendance)
    - BP 003A Concrete (Foundations/SOG/Misc Concrete)
    - BP 005A Structural Steel & Misc Metals (Material & Install)
    - BP 006A General Construction
    - BP 009A Gypsum Wallboard, Insulation & Ceilings, Paint & Wallcovering
    - BP 021A Fire Protection
    - BP 022A Mechanical (HVAC, Plumbing & BAS)
    - BP 026A Electrical (Fire Alarm, Structured Cabling, Security, Access Control & AV
    - BP 031A Selective Site Demo, Grading/Excavating, Site Utilities, Site Paving & Exterior Improvements
- IMEO Form (Required for facility access to tour)

Official Documented Meeting Minutes

- Project team introductions were given for Weitz, Design Team, DAS, CCM
- Discussed BPs with mandatory attendance listed above.
- Sign-In sheets passed around - Pre-Bid meeting site visit form to be signed by Stephanie or James, Weitz Sign-in sheet, confidentiality form, site visitor sheet

Project Overview

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
2.1	1	Project Description				Open

Description
Architectural & MEP Overview, including phasing

- Phase 1 Addition
- Phase 2 Remodel (Lab, Sally Port, Tissue Storage & SE Offices)
- Phase 3 Remodel (NE Offices)

Base bid

Alternates

- Alternate No. 1: Site Improvements
- Alternate No. 2: Existing Office Finishes & Window Treatments
- Alternate No. 3: Mechanical Piping Redundancy
- Alternate No. 4: Structured Cabling

IMEO **MUST remain operational through all phases of construction.**
Contractors shall perform their workscope in a manner that minimizes (or eliminates when possible) any impact to IMEO. Contractors shall be respectful of the sensitive work of IMEO and the elevated level of security the facility demands.

-

Official Documented Meeting Minutes

- Aaron T. gave a brief overview of scope on the project
    - Emphasized importance of keeping existing facility operational through all 3 phases
    - Discussed 3 different phases
    - Mechanical scope service areas & tie in / sequencing with existing phases
    - Adding cooling tower & pump house
    - Adding dedicated generator to lab facility
    - Condensers on west side of existing building relocation as one of 1st activities on site
    - Site logistics plans referenced
    - Background checks necessary before working on site
    - 3 main punchlists - one for each phase
    - 2 main allowances with Siemens & Basepoint
    - 4 Alternates - site improvements, existing office finishes, mechanical piping for campus redundancy, structured cabling
- Chad with KCL discussed mechanical / plumbing systems overview
    - AHU feeds entire building currently, after construction the new system and existing system will feed different areas
    - Strict requirements for air sealing between lab and office space
- Stephanie discussed 13 BPs found in 01 12 00, with bidder responsibility to look through other bid packages as well as entire plan set
    - Weitz safety rules, inclusions, exclusions listed here
    - Emphasized importance of site security & keeping facility operational the entire process of construction
    - Bid milestone schedule released in addendum 1

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
2.2	1	Project Schedule				Open

Description

Milestone Bid Schedule to be issued via Addendum #1:

- Phase 1 Addition: March 2026 - July 2027
- Phase 2 Remodel (Lab, Sally Port, Tissue Storage & SE Offices): Sept. 2027 - March 2028
- Phase 3 Remodel (NE Offices): April 2028 - June 2028

Anticipate contract(s) Issued: Early February 2026

- Coordination & pre-planning meetings
- Submittal processing

Multiple pull-plan sessions will be held with the successful bid package contractors to add detail and finalize the construction schedule.

State Holidays: New Year's Day, Martin Luther King Day, Memorial Day, 4th of July, Labor Day, Veterans Day, Thanksgiving and day after Thanksgiving, Christmas Day

Official Documented Meeting Minutes

- Stephanie noted that the Last Planner method will be used for schedule
    - She discussed large milestones
    - There is time between phases in order to give owner time to move items, equipment, and furniture in between
    - Anticipate contracts finalized in February
        - Hoping to be discussing procurement and pull planning after contracts finalized
    - Notice of intent is aiming to be sent out before Christmas

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
2.3	1	Site Rules				Open

Description

- **Onsite supervision by Prime Contractor is REQUIRED AT ALL TIMES** when work by that contractor or their subcontractors/suppliers is taking place.
- Contractors shall provide daily logs for each day they are on site.
- Weekly Prime Contractor Meetings will be established once construction starts. Contractors to begin attending the weekly meetings 6 weeks before starting work on site, if not before.
- It is of the utmost importance to show respect and courtesy to all staff at all times.
- No smoking, vaping or smokeless tobacco use onsite.
- Work Hours: 7am - 3:30pm Mon-Fri, unless pre-approved and coordinated with Weitz
- **Background checks are REQUIRED,** a passed background check must be on file before a worker is allowed to be on site.

Temporary Facilities & Controls Matrix is included in the specifications & outlines responsibilities of Contractors.

Site Logistics Plans for each phase are included in the drawings.

Official Documented Meeting Minutes

- Stephanie discussed site rules listed in description above.
- Stephanie described background check process, link added in addendum 1

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status

- $15 / person roughly, which will be by each contractor needing checks
- Passed background check needed on file before working on site

- Temporary facilities & controls matrix noted, found in specifications

RFB Overview

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.1	1	Bid Submission				Open

Description

- Bids are due ***Tuesday, December 16, 2025 at 2pm (to be clarified via addendum #1)***
- The Bid shall be submitted to the Issuing Officer through the IMPACS Electronic Procurement System.
  - Link and information is in the project manual
  - Contractors will need to register prior to bidding
  - Bidders will need to register regardless of whether they have conducted business previously with the State of Iowa.
  - Bidders should complete the registration process and ensure the ability to log in as soon as possible to ensure Bids can be submitted on the due date.
  - Please make sure the electronic documents submitted contain any required signatures. Digital signatures will be accepted.
- Bid Opening will be held via conference call on ***Tuesday, December 16, 2025 at 3pm***
- Contractor shall reference the specifications for the bid submittal checklist
  - Bid Proposal Information
  - Non Discrimination Clause Information
  - Contractor Targeted Small Business Enterprise Pre-Bid Contract Information
  - Bid Security – 5% of total Bid amount
- Apparent low bidder will be required to submit subcontractor/supplier list 48hrs after the bid opening

Official Documented Meeting Minutes

- Stephanie talked through bid submission process as described in the description above
  - Noted to log in and make sure no issues ahead of bid day so technology issues do not prevent bidding

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.2	1	Bid Schedule				Open

Description
Bidder questions must be submitted in writing to DAS Procurement: Construction.Procurement@iowa.gov

- Questions/Substitution Requests are due in writing by 5pm on Tuesday, December 9, 2025

Addendum Schedule (tentative):

- Addendum #1: Monday, November 24, 2025
- Addendum #2: Friday, December 5, 2025
- Addendum #3: Thursday, December 11, 2025

- Bids Due: Tuesday, December 16, 2025 by 2pm
- Tentative NOI Issued: December 23, 2025

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status

- Tentative Prime Contracts Executed: February 2, 2026

Official Documented Meeting Minutes

- Stephanie talked through bid schedule as listed in description above.
- Addendum #2 intending to be sent out this Friday, 12/5 to capture meeting minutes, any document changes, etc
- Addendum #3 targeting Thursday, December 11th in order to give bidders time to review any changes made

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.3	1	Administrative Details				Open

Description

- Contractors will sign a modified ConsensusDocs 802. Example in the project manual.
- Project-specific Certificate of Insurance must be provided prior to contract execution. Follow example in the project manual and limits in the 802.
- Project-specific P&P bonds must be provided prior to contract execution.
- Successful contractor must turn in their list of subcontractors and suppliers within 48 hours of the bid.
- DAS will provide tax exempt certificates upon request.
- Procore will be used for all project management, at no cost to the trade contractor.
    - Submittals, Invoicing, RFIs, ASIs, PRs, RFQs
    - Contracts, Change Orders and Certificates of Substantial and Final Completion will also use Docusign
- Contractor Schedule of Values shall be broken out as specified in the project manual.
    - SOV must contain a closeout line item for at least 1% of the total contract value.
    - This line item can only be invoiced once the certificate of final completion has been signed by all parties.

Official Documented Meeting Minutes

- Stephanie talked through admin. details as listed in description above.

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.4	1	Pre-Bid Site Visits				Open

Description
Site Tour (Break into smaller groups if needed)

- Site
- Basement
- Interior

Official Documented Meeting Minutes

- Attendees were split into 2 groups due to size and walked through the interior and exterior of facility

Questions

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
4.1	1	Questions				Open

Description
Submit all questions in writing to construction.procurement@iowa.gov.

Official Documented Meeting Minutes

- If contractor is bidding on multiple packages, bid bond is required for each individual submission - treat each bid package being submitted on as its own submission with complete packet/submittal required for bid regardless if bidding on other packages as well
- Steph noted that estimate can be provided via addendum
- Stretch and flex will be right at opening of job, which will typically be at 7:00am, with all contractors on site performed as 1 group
- On site safety person is not required for each prime contractor but on site supervision is required by prime contractor at all times contractor or sub-tiers are on site.

These meeting minutes are believed to be an accurate reflection of those items discussed and the conclusions that were reached during the referenced meeting.
Please contact State of Iowa - Department of Administrative Services if there are any discrepancies or questions with the content of these minutes.

9429.00 HHS ANK IMEO Expansion & Renovation
Pre-Bid Walk
Wednesday December 3, 2025

	Name	Company	Phone #	Email
1.	Stephanie Morrison	Weitz	515.201.3766	stephanie.morrison@weitz.com
2.	MIKE MULLENA	CORE CONSTRUCTION	515-202-9870	MIKEM@CORECONSTRUCTIONIA.COM
3.	GABE DEFOREST	OPN	785-260-1258	GDEFOREST@OPNARCHITECTS.COM
4.	AARON TWEDT	OPN	515-309-0722	ATWEDT@OPNARCHITECTS.COM
5.	Jeff Pearson	Henkel Const.	515-291-1159	jeff@henkelconstruction.com
6.	Jose V. Guzman	Euro	346-228-9918	Eurodesignsllc93@gmail.com
7.	Joe. Nall	HSI	(515) 787-7722	JNall@HSI123.com
8.	JEROME MILLER	BAKER ELECTRIC	515 480-7878	JMILLER@BAKERELECTRIC.com
9.	JOE MANGOLD	BAKER ELECTRIC	515 778-7606	JMangold@Bakerelectric.com
10.	Taylor Myer	Dean Snyder Construction	515-402-5115	tmyer@deansnyder.com
11.	Ryan Huizer	Dean Snyder const.	515-240-3520	rhuizer@deansnyder.com
12.	Ian Fletcher	Dean Snyder Construction	515-291-4410	ifletcher@deansnyder.com

9429.00 HHS ANK IMEO Expansion & Renovation
Pre-Bid Walk
Wednesday December 3, 2025

	Name	Company	Phone #	Email
13.	Matt Cullins	Graphite Construction	515 278-9446	MCullins@graphitegrp.com
14.	Justin Malloy	Ahern Fire Protection	515-851-2823	JMalloy@Aherntire.com
15.	Alex Landgrebe	Tri-City Fire Protection	(515) 689-5319	alandgrebe@tricityfp.com
16.	Thomas Malloy	FSC Foundation Service Corp.	319 575 0625	tomm@foundationservicecorp.com
17.	Jim Keys	Keys Professional Painting	515-518-7151	jim.keys@keysprofessionalpainting.com
18.	Brent Thompson	Elder Corporation	(515) 205-3478	Brent@eldercorp.com
19.	Eric Forbes	MetaForge Industrial Systems	402-350-3227	Eric.Forbes@metaforgers.com
20.	Caleb Meis	Waldinger	515 6891490	caleb.meis@waldinger.com
21.	Tyler Shipman	Central States Roofing	515-290-1743	tyler@CSRoofing.com
22.	Adam Farnham	Allied Construction	515-322-2139	afarnham@alliedconst.com
23.	Ryan Fish	Sandstone Management	515-689-3631	Ryan@sandstonemgmt.com
24.	John Chase	JC Toland Painting, LLC	515-204-1398	john.chase@jctolandpainting.com

9429.00 HHS ANK IMEO Expansion & Renovation
Pre-Bid Walk
Wednesday December 3, 2025

	Name	Company	Phone #	Email
25.	John Nihsen	Ziegler -CAT	515-238-1433	John.Nihsen@zieglercat.com
26.	Mitch Zeman	Breiholz Const.	515-288-6077	mitchz@breiholz.com
27.	Isaac Hartmann	Weitz	515-864-8[illegible]60	Isaac.hartmann@weitz.com
28.	LOREN Miller	Anderson Mechanical Corp	515-227-8329	LorenM@AndersonMechCORP.com
29.	MICHAEL STOUT	ANDERSON Mechanical Corp	641-295-0850	MikeS@andersonmechanicalcorp.com
30.	Addison Furry	Price Electric	319-929-6357	afurry@priceelectric.us
31.	Joe Scott	Waldinger	515-208-9544	joe.scott@waldinger.com
32.	Dave Wilson	Neumann Brothers	515-243-0156	kit@neumannbros.com
33.	Tyler Gustason	Waldinger	515 323-8742	tyler.gustason@waldinger.com
34.	Josh Redhead	VEIT	657-769-0134	Josh.Redhead@VEITUSA.com
35.	Matt VanMaanen	VanMaanen Electric	641-791-9473	matt@vanmaanenelectric.com
36.	NICK RUHSER	VEIT	515-400-7811	nicholas.ruhser@veitusa.com

9429.00 HHS ANK IMEO Expansion & Renovation
Pre-Bid Walk
Wednesday December 3, 2025

	Name	Company	Phone #	Email
37.	Tyler Bucher	Corell Contractor	515-208-1774	TBucher@corellcontractor.inc.com
38.	Adam Farnham	Allied Construction	515-322-2139	afarnham@alliedconst.com
39.	RYAN FISH	SANDSTONE MANAGEMENT	515-689-3631	RYAN@SANDSTONEMGMT.COM
40.	Steve Wenner	Jensen Builders	515-292-5000	stevew@jensenbuilders.com
41.	Justin Moffitt	US Erectors, Inc.	515-243-9466	JMoffitt@US-erectors.com
42.	Jason Tibbits	Menefee Drywall	515-631-2241	jtibbits@menefeedrywall.com
43.	Samantha Blettner	Heartland Companies	515-421-3593	samanthab@hrtlnd.us
44.	Mitchell Hiddessen	Performance Contracting Inc.	515.443.4317	mitchell.hiddessen@pcg.com
45.	Michael Bradbury	DAS-CPE	515-932-8327	Michael.Bradbury@Iowa.gov
46.	Curtis McGrane	Weitz	515-698-4279	curtis.mcgrane@weitz.com
47.	Will Fedler	weitz	515 491 5106	will.fedler@weitz.com
48.	Brandon Burkhart	NAI	(515)291-7190	brandon.burkhart@nai-ames.com

9429.00 HHS ANK IMEO Expansion & Renovation
Pre-Bid Walk
Wednesday December 3, 2025

49. Zach Scato~ Absolute Group
50. Andrew Pritchard Academy Roofing & Sheet Metal Co 515-689-1225 apritchard@academyroofing.com
51. Tom Martens Summit Fire
52. TY CORRIGAN WEITZ 515-314-1569 TY.CORRIGAN@WEITZ.COM
53.
54.
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59.
60.

9429.00 HHS ANK IMEO Expansion & Renovation

Bid Packages	Estimate
003A Concrete (Foundations/SOG/Misc Concrete)	$1,258,554
004A Masonry	$393,280
005A Structural Steel Material &Misc Metals (Material & Install)	$1,058,734
006A General Construction	$5,231,865
007A Roofing & Sheet Metal	$564,311
007B Metal Panels	$627,592
008A Exterior/Interior Glazing Systems	$686,033
009A Gypsum Wallboard, Insulation & Ceilings, Paint & Wallcovering	$1,959,059
009C Terrazzo	$459,772
021A Fire Protection	$163,498
022A Mechanical	$8,800,212
026A Electrical	$3,365,634
031A Selective Site Demo, Grading/Excavating, Site Utilities, Site Paving and Exterior Improvements	$1,494,420
Total	**$26,062,964**

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VOLUME I

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AD101B	RENOVATION - DEMO FLOOR PLAN - MAIN LEVEL
AD103A	ADDITION - DEMO ROOF PLAN
AD103B	RENOVATION - DEMO ROOF PLAN
AD151A	ADDITION - DEMO RCP - MAIN LEVEL
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A311	WALL SECTIONS
A312	WALL SECTIONS
A313	WALL SECTIONS
A314	WALL SECTIONS
A315	WALL SECTIONS
A316	WALL SECTIONS
A317	WALL SECTIONS
A318	WALL SECTIONS
A319	WALL SECTIONS
A320	WALL SECTIONS
A321	WALL SECTIONS
A322	WALL SECTIONS
A323	WALL SECTIONS
A324	WALL SECTIONS
A325	WALL SECTIONS
A326	WALL SECTIONS
A327	WALL SECTIONS
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A350	EXTERIOR SECTION DETAILS
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A504	INTERIOR ELEVATIONS
A505	INTERIOR ELEVATIONS
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VOLUME II

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M101A-N	HVAC PLAN - MAIN LEVEL - ADDITION - NORTH
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M101B	HVAC PLAN - MAIN LEVEL - RENOVATION
M101B-N	HVAC PLAN - MAIN LEVEL - RENOVATION - NORTH
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M304	MECHANICAL DETAILS
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MH101A(ALT)	MECHANICAL PIPING MAIN LEVEL - ADDITION (ALTERNATE)
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PD101B	PLUMBING DEMOLITION - MAIN LEVEL
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P101A-N	PLUMBING PLAN - MAIN LEVEL - ADDITION - NORTH
P101A-S	PLUMBING PLAN - MAIN LEVEL - ADDITION - SOUTH
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P101B-S	PLUMBING PLAN - MAIN LEVEL - RENOVATION - SOUTH
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ED102	ELECTRICAL POWER - RENOVATION DEMO
ED103	ELECTRICAL POWER - MAIN LEVEL - TEMPORARY PHASE
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ED302	ELECTRICAL LIGHTING - RENOVATION DEMO
E100	ELECTRICAL POWER PLAN - LOWER LEVEL
E101	ELECTRICAL POWER PLAN - MAIN LEVEL - ADDITION
E101A-N	ELECTRICAL POWER PLAN - MAIN LEVEL - ADDITION - NORTH
E101A-S	ELECTRICAL POWER PLAN - MAIN LEVEL - ADDITION - SOUTH
E101B-N	ELECTRICAL POWER PLAN - MAIN LEVEL - RENOVATION - NORTH
E101B-S	ELECTRICAL POWER PLAN - MAIN LEVEL - RENOVATION - SOUTH
E102	ELECTRICAL POWER - PENTHOUSE & MAIN LEVEL ELECTRICAL ROOM
E301	ELECTRICAL LIGHTING PLAN - MAIN LEVEL - ADDITION
E301A-N	ELECTRICAL LIGHTING PLAN - MAIN LEVEL - ADDITION - NORTH
E301A-S	ELECTRICAL LIGHTING PLAN - MAIN LEVEL - ADDITION - SOUTH
E301B-N	ELECTRICAL LIGHTING PLAN - MAIN LEVEL - RENOVATION - NORTH
E301B-S	ELECTRICAL LIGHTING PLAN - MAIN LEVEL - RENOVATION - SOUTH
E302	ELECTRICAL LIGHTING PLAN - PENTHOUSE
E401	ELECTRICAL ONE-LINE DIAGRAM
E501	ELECTRICAL DETAILS
E601	ELECTRICAL SCHEDULES
E602	ELECTRICAL SCHEDULES
E603	ELECTRICAL PANEL SCHEDULES
E604	ELECTRICAL PANEL SCHEDULES
E605	ELECTRICAL EXISTING PANEL SCHEDULES

FIRE ALARM DRAWINGS

FAD101A	FIRE ALARM DEMO - MAIN LEVEL - ADDITION
FAD101B	FIRE ALARM DEMO - MAIN LEVEL - RENOVATION
FA101A	FIRE ALARM PLAN - MAIN LEVEL - ADDITION
FA101B	FIRE ALARM PLAN - MAIN LEVEL - BLDG B

TECHNOLOGY DRAWINGS

T000	TECHNOLOGY COVER
T100	TECHNOLOGY - SITE PLAN
TD201	TECHNOLOGY - ADDITION DEMO
TD202	TECHNOLOGY - RENOVATION DEMO
TA101A	AUDIO VISUAL - MAIN LEVEL - ADDITION
TA101B	AUDIO VISUAL - MAIN LEVEL - RENOVATION
TA300	AUDIO VISUAL - DETAILS
TA400	AUDIO VISUAL ELEVATIONS
TS102A	SECURITY CEILING PLAN - MAIN LEVEL - ADDITION
TS102B	SECURITY CEILING PLAN - MAIN LEVEL - RENOVATION
TS200	ACCESS CONTROL DETAILS
TT101A	TECHNOLOGY - MAIN LEVEL - ADDITION
TT101B	TECHNOLOGY - MAIN LEVEL - RENOVATION
TT103	TELECOM ENLARGED PLANS & DETAILS

SITE LOCATION MAP

ADD

All questions regarding these plans and specifications should be directed to:

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515-309-0722

I hereby certify these plans and specifications were prepared by me or under my direct personal supervision and that I am a duly licensed professional architect under the laws of the state of Iowa.

Signature:

Name: Terry Gebard

Iowa Registration No: 05219 **Renewal Date:** 6/30/2026

Sheets covered by this seal: Listed As "Architectural"

I hereby certify 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.

Signature:

Name: Erik Raker

Iowa Registration No: 17922 **Renewal Date:** 12/31/2025

Sheets covered by this seal: Listed As "Structural"

I hereby certify 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.

Signature:

Name: Justin F. Strom

Iowa Registration No: P24140 **Renewal Date:** 12/31/2026

Sheets covered by this seal: Listed As "Civil"

I hereby certify 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.

Signature:

Name: Chad Bass

Iowa Registration No: 21397 **Renewal Date:** 12/31/2025

Sheets covered by this seal: Listed As "Fire Protection, Mechanical, & Plumbing"

I hereby certify 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.

Signature:

Name: Eric Heynen

Iowa Registration No: P24706 **Renewal Date:** 12/31/2025

Sheets covered by this seal: Listed As "Electrical & Technology"

PROJECT ALTERNATES

1. SITE IMPROVEMENTS
   SHEETS: G200, C301
2. EXISTING OFFICE FINISHES & WINDOW TREATMENTS
   SHEETS: G201
3. AHU-2 MECHANICAL PIPING REDUNDANCY CONNECTIONS
   SHEETS: G201, MH101A(ALT), MH101B(ALT)
4. ALL NEW STRUCTURED CABLING TO BE PROVIDED AS CAT6A AND EXISTING CABLING CHANGED TO CAT6A THROUGHOUT.
   SHEETS: TECHNOLOGY SHEETS INCLUDING T000

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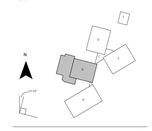
Key Plan



Revision	Description	Date
ADD 01	ADDENDUM 01	11/14/2025
ADD 02	ADDENDUM 02	12/03/2025

OPN Project No.: 23825001
SCI Project No.: 9429.00

Sheet Issue Date: BID DOCUMENTS 11/13/2025

Sheet Name: INDEX, SEALS, LOCATION MAP

Sheet Number: G001

PRINTED: 12/4/2025 11:24:09 AM

GP1 GENERAL PARAMETERS
STRUCTURAL DRAWINGS ARE A PORTION OF THE CONTRACT DOCUMENTS AND ARE INTENDED TO BE USED WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE REQUIREMENTS AND FEATURES OF DRAWINGS INTO THEIR SHOP DRAWINGS AND WORK.

GP2 VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO FABRICATION OF ANY ITEMS.

GP3 DRAWINGS SHALL BE COORDINATED WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL OPENINGS, ELECTRICAL COMPONENTS, FLOOR DEPRESSIONS, ETC. NOT SHOWN ON DRAWINGS. COORDINATE LOCATION, SIZE AND REINFORCEMENT OF ALL OPENINGS WITH RESPECTIVE TRADES BEFORE FABRICATION. REPORT ANY DISCREPANCIES AND/OR INTERFERENCE PROBLEMS TO THE ARCHITECT AND STRUCTURAL ENGINEER OF RECORD.

GP4 THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, NOTES AND DETAILS ON THE STRUCTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER THE GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE PROVIDED, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK.

GP5 THE BUILDING IS NOT STRUCTURALLY STABLE UNTIL ALL CONNECTIONS, FRAMING, SHEAR WALLS, X-BRACING, AND EXTERIOR WALLS ARE COMPLETE AND HAVE ACHIEVED FINAL DESIGN STRENGTH. CONTRACTOR IS SOLELY RESPONSIBLE FOR MAINTAINING STRUCTURAL STABILITY OVERALL AND TO ALL PORTIONS OF THE BUILDING DURING CONSTRUCTION AND ERECTION. ALL TEMPORARY BRACING, SHORING, FORMWORK, GUYS, TIE-DOWNS AND SIMILAR ITEMS ARE REQUIRED TO BE DESIGNED BY, AND AT THE EXPENSE OF, THE CONTRACTOR. STRUCTURAL DRAWINGS DO NOT NECESSARILY INDICATE ANY OR ALL TEMPORARY OR PERMANENT SUPPORT SYSTEMS. TEMPORARY BRACING SYSTEMS ARE NOT TO BE REMOVED UNTIL STRUCTURAL WORK IS COMPLETE OR CONTRACTOR DEEMS THE AREA UNDER CONSIDERATION TO BE STABLE.

GP6 CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS ON THE STABILITY OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.

GP7 RETAINING WALLS AND BASEMENT WALLS WHICH TIE TO UPPER SLABS SHALL NOT BE BACKFILLED UNTIL THE UPPER SLABS REACH FULL DESIGN STRENGTH, UNLESS ADEQUATE BRACING IS PROVIDED AT THE TOP OF THE WALL.

GP8 AS USED IN GENERAL NOTES AND THROUGHOUT STRUCTURAL DRAWINGS, THE TERM "CONTRACTOR" IS DEFINED TO INCLUDE ANY OR ALL OF THE FOLLOWING: CONTRACTOR AND THEIR SUBCONTRACTORS, CONSTRUCTION MANAGER AND THEIR SUBCONTRACTORS, FABRICATORS, INSTALLERS, DELEGATED DESIGNERS/ENGINEERS AND OTHERS.

DP1 DESIGN PARAMETERS
THE STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE ICC INTERNATIONAL BUILDING CODE, 2015 EDITION.

DP2 UNIFORM LIVE LOADS:

TYPICAL ROOF (GOVERNED BY SNOW):	25 PSF+DRIFT
MECHANICAL ROOF	100 PSF
STAIRS AND OTHER EXITS	100 PSF
MECHANICAL PENTHOUSE	150 PSF

DP3 CONCENTRATED LIVE LOADS:

TYPICAL OFFICE (OVER 2.5 FT. x 2.5 FT.)	2000 LB
TYPICAL STAIRS (OVER 2 IN. x 2 IN.)	300 LB

DP4 SNOW DESIGN PARAMETERS:

GROUND SNOW LOAD (Pg)	30 PSF
FLAT ROOF SNOW LOAD (Pf)	25 PSF
SNOW EXPOSURE FACTOR (Ce)	1.0
SNOW LOAD IMPORTANCE FACTOR (I)	1.0
SNOW LOAD THERMAL FACTOR (Ct)	1.0

DP5 EARTHQUAKE DESIGN PARAMETERS:

SEISMIC IMPORTANCE FACTOR (IE)	1.0
Ss	0.066g
S1	0.046g
SEISMIC SITE CLASS	D
Sds	0.068g
Sd1	0.073g
SHORT-PERIOD SITE COEFFICIENT (Fa)	1.6
LONG-PERIOD SITE COEFFICIENT (Fv)	2.4
SEISMIC DESIGN CATEGORY	A

SEISMIC-FORCE-RESISTING SYSTEM:
LIGHT-FRAMED WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE OR STEEL SHEETS

SEISMIC BASE SHEAR (V) N-S	5 k
SEISMIC BASE SHEAR (V) E-W	5 k
SEISMIC RESPONSE COEFFICIENT (Cs) N-S	0.034
SEISMIC RESPONSE COEFFICIENT (Cs) E-W	0.034
RESPONSE MODIFICATION FACTOR (R) N-S	2
RESPONSE MODIFICATION FACTOR (R) E-W	2
REDUNDANCY FACTOR (ρ) N-S	1.0
REDUNDANCY FACTOR (ρ) E-W	1.0

SEISMIC ANALYSIS PROCEDURE:
EQUIVALENT LATERAL FORCE ANALYSIS

DP6 WIND DESIGN PARAMETERS:

BASIC WIND SPEED (V) (3-SECOND GUST)	115 MPH
RISK CATEGORY	II
WIND EXPOSURE CATEGORY	B
INTERNAL PRESSURE COEFFICIENT	+/- 18
BASIC DESIGN PRESSURE @ ROOF	15 PSF (SERVICE)
NET WIND UPLIFT @ ROOF	10 PSF (SERVICE)

DP7 ALLOWABLE WALL DEFLECTIONS:

EXTERIOR (CLADDING DESIGN)	L/360
INTERIOR	L/360

DP8 ALLOWABLE FRAMING DEFLECTIONS:

ROOF LIVE LOAD	L/360
ROOF TOTAL LOAD	L/240
FLOOR LIVE LOAD	L/360
FLOOR TOTAL LOAD	L/240

DP9 ASSUMED FUTURE CONSTRUCTION:

VERTICAL	NONE
HORIZONTAL	NONE

FP FOUNDATION PARAMETERS
SIZE AND BOTTOM ELEVATIONS OF FOOTINGS HAVE BEEN ESTABLISHED BASED ON THE GEOTECHNICAL REPORT FILE NO. 08255071-01 PREPARED BY TERRACON AND DATED 07/16/2025. AS EXCAVATION PROGRESSES, UNANTICIPATED SOIL CONDITIONS MAY REQUIRE CHANGES. CONTACT STRUCTURAL ENGINEER OF RECORD FOR EVALUATION OF THESE CHANGES.

FP2 ALLOWABLE SOIL BEARING PRESSURE
SQUARE FOOTINGS ..... 5000 PSF
SQUARE FOOTINGS ..... 5000 PSF

FP2.1 OVEREXCAVATION IS REQUIRED TO ACHIEVE THE BEARING PRESSURES INDICATED IN NOTE FP2. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR ADD'L INFORMATION.

FP2.2 AGGREGATE/STONE PIERS (EX. GEOPIERS) ARE REQUIRED TO ACHIEVE THE BEARING PRESSURES INDICATED IN NOTE FP2. PIER LAYOUT ON PLANS AND DETAILS ON FOR REFERENCE ONLY. FINAL SIZE, QUANTITY AND LOCATION OF PIERS SHALL BE DETERMINED BY PIER DESIGNER.

FP3 MINIMUM FOOTING DEPTH FOR FROST PROTECTION
BELOW FINISH GRADE)..... 42 IN.

FP4 DESIGN EARTH PRESSURES:

ACTIVE	35 PCF
PASSIVE	200 PCF
AT REST	60 PCF

FP5 GEOTECHNICAL ENGINEER IS SOLE JUDGE OF THE SUITABILITY OF UNDERLYING MATERIAL TO SUPPORT FOUNDATIONS. BEARING MATERIAL SHALL BE APPROVED BY GEOTECHNICAL ENGINEER BEFORE FOUNDATION INSTALLATION. DO NOT PROCEED WITHOUT APPROVAL.

FP6 PRIOR TO COMMENCING EARTHWORK, CONTRACTOR SHALL REVIEW AND BE FAMILIAR WITH ALL ASPECTS OF THE GEOTECHNICAL REPORT. CONTACT GEOTECHNICAL ENGINEER IF QUESTIONS OR DISCREPANCIES.

AP AGGREGATE/STONE PIERS
AP1 AGGREGATE/STONE PIER WORK SHALL CONFORM WITH CHAPTER 18 OF THE IBC.

AP2 CONTRACTOR SHALL PARTICIPATE IN A PRE-CONSTRUCTION MEETING PRIOR TO AGGREGATE/STONE PIER WORK.

AP3 AGGREGATE/STONE PIER DESIGN IS TO BE PROVIDED BY THE CONTRACTOR AND SHALL INCLUDE:
- AP3.1 CALCULATIONS, DESIGN DRAWINGS AND SHOP DRAWINGS THAT BEAR THE SEAL AND SIGNATURE OF AN ENGINEER REGISTERED IN THE APPROPRIATE STATE AND SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO CONSTRUCTION.
- AP3.2 DESIGN SHALL CONSIDER ALL ASPECTS INCLUDED IN THE GEOTECHNICAL REPORT.
- AP3.3 DESIGN SHALL ACCOMMODATE A MINIMUM ALLOWABLE NET SOIL BEARING PRESSURE OF 5,000 PSF.
- AP3.4 DESIGN SHALL ACCOMMODATE AN ESTIMATED MAXIMUM TOTAL LONG-TERM SETTLEMENT FOR FOOTINGS OF 1 INCH.
- AP3.5 DESIGN SHALL ACCOMMODATE AN ESTIMATED MAXIMUM TOTAL LONG-TERM DIFFERENTIAL SETTLEMENT OF ADJACENT FOOTINGS OF 1/2 INCH.

AP4 AGGREGATE/STONE PIER LOCATIONS SHOWN ON PLAN ARE SCHEMATIC ONLY. SIZE, DEPTH, QUANTITY, AND LOCATION SHALL BE PROVIDED BY CONTRACTOR AND SHOWN IN PIER SHOP DRAWINGS.

AP5 DAILY PROGRESS REPORTS SHALL BE COMPLETED AND MADE AVAILABLE TO THE ARCHITECT, ENGINEER, GEOTECHNICAL ENGINEER AND INDEPENDENT TESTING AGENCY AS REQUIRED.

AP6 CONTRACTOR RESPONSIBLE FOR LOCATING AND PROTECTING ABOVE AND BELOW GROUND UTILITIES THAT MAY BE AFFECTED BY AGGREGATE/STONE PIER INSTALLATION.
CONTRACTOR TO COORDINATE WITH OTHER TRADES TO IDENTIFY AND RESOLVE CONFLICTS INVOLVED WITH THE INSTALLATION OF AGGREGATE/STONE PIERS.

SU SUBMITTALS
SU1 CONTRACTOR TO PROVIDE A SHOP DRAWING SUBMITTAL LOG ITEMIZING ALL PROPOSED SUBMITTALS FOR APPROVAL BY STRUCTURAL ENGINEER OF RECORD.

SU2 ALL SHOP DRAWINGS SHALL BE CHECKED BY THE FABRICATOR AND APPROVED BY THEIR CONTRACTOR PRIOR TO SUBMITTAL TO THE STRUCTURAL ENGINEER OF RECORD. SHOP DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF GENERAL CONFORMANCE TO THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR ANY CHANGES FROM THE CONTRACT DOCUMENTS, DIMENSIONAL ERRORS, COORDINATION ERRORS, OR OMISSIONS IN SHOP DRAWINGS.

SU3 SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION AND CONSTRUCTION REGARDING ALL STRUCTURAL ITEMS, INCLUDING THE FOLLOWING:
- CONCRETE MIX DESIGNS (5 DAYS BEFORE POUR, MIN.)
- REINFORCING EQUIPMENT
- MASONRY REINFORCEMENT
- EMBEDDED STEEL ITEMS
- STRUCTURAL STEEL
- STEEL JOISTS
- STEEL DECK
- LT. GA. METAL STUDS

SU4 SHOP DRAWINGS SHALL INCLUDE CONNECTIONS AS WELL AS SIZE, SPACING, AND GRADE OF ALL MEMBERS. PLANS AND ANY DETAILING NECESSARY FOR DETERMINING FIT AND PLACEMENT SHALL ALSO BE INCLUDED.

SU5 IF SHOP DRAWINGS DIFFER FROM OR ADD TO THE DESIGN OF THE STRUCTURAL DRAWINGS, THEY SHALL BEAR THE SEAL AND SIGNATURE OF AN ENGINEER REGISTERED IN THE APPROPRIATE STATE. ANY CHANGES TO THE STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND ARE SUBJECT TO REVIEW AND APPROVAL OF THE CONNECTING ENGINEER OF RECORD.

SU6 DESIGN DRAWINGS, SHOP DRAWINGS, AND CALCULATIONS FOR THE DESIGN AND FABRICATION OF ITEMS THAT ARE DESIGNED BY THE CONTRACTOR, INCLUDING:
- STEEL JOISTS
- STRUCTURAL MASONRY CONNECTIONS
- JOIST GIRDERS
- METAL ROOF DECK
- LIGHT GA. METAL FRAMING
- STAIRS
- SKYLIGHTS
- WINDOW WALLS AND ALL OTHER GLAZING SYSTEMS
- TEMPORARY SHORING

SHALL BEAR THE SEAL AND SIGNATURE OF AN ENGINEER REGISTERED IN THE APPROPRIATE STATE AND SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION AND CONSTRUCTION. CALCULATIONS SHALL BE INCLUDED FOR ALL CONNECTIONS TO THE STRUCTURE, CONSIDERING CALCULATED EFFECTS ON STRUCTURAL ELEMENTS INDUCED BY THE CONNECTIONS.

SU7 ITEMS THAT ARE DESIGNED BY THE CONTRACTOR SHALL BE DESIGNED TO RESIST THE LIVE LOADS INDICATED IN STRUCTURAL NOTES, DEAD LOAD, SELF WEIGHT, AND ADDITIONAL LOADING FROM ITEMS AND ANY OTHER LOADS THAT ACT ON AND A NET WIND UPLIFT.

SU8 ITEMS THAT ARE DESIGNED BY THE CONTRACTOR SHALL INCLUDE ANY RELEVANT TECHNICAL LITERATURE FROM MANUFACTURER. ALSO PROVIDE A CERTIFICATION FROM THE MANUFACTURER SHOWING THE PRODUCT IS IN COMPLIANCE WITH ALL APPLICABLE CODES AND STANDARDS.

SU9 THE CONTRACTOR SHALL COORDINATE SEISMIC RESTRAINTS OF MECHANICAL, PLUMBING, AND ELECTRICAL EQUIPMENT, MACHINERY, AND ASSOCIATED PIPING WITH THE STRUCTURE. ANY CONNECTIONS TO STRUCTURE SHALL CONFORM TO ASCE 7, CHAPTER 13 AND SHALL BE DESIGNED BY AN ENGINEER REGISTERED IN THE APPROPRIATE STATE, AND SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION.

SU10 FIELD ENGINEERED DETAILS DEVELOPED BY THE CONTRACTOR THAT DIFFER FROM OR ADD TO THE STRUCTURAL DRAWINGS SHALL BEAR THE SEAL AND SIGNATURE OF AN ENGINEER REGISTERED IN THE APPROPRIATE STATE AND SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO FABRICATION.

VERIFICATION AND INSPECTION — **FREQUENCY / TASK**

STEEL & DECKING - CONFORM TO AISC 360 REQUIREMENTS	
1. VERIFY COMPLIANCE OF DECK & ALL DECK ACCESSORIES WITH CONSTRUCTION DOCUMENTS & STEEL DECK MANUFACTURER'S SPECIFICATIONS.	PERFORM
2. INSPECTION TASKS PRIOR TO WELDING:	
A. WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE.	PERFORM
B. MANUFACTURER'S CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE.	PERFORM
C. MATERIAL IDENTIFICATION (TYPE/GRADE).	OBSERVE
D. WELDER IDENTIFICATION SYSTEM.	OBSERVE
E. FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY): • JOINT PREPARATION • DIMS. OF BACKING (IF USED) • ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELDER QUALIFICATION) • BACKING TYPE & FIT (IF APPLICABLE)	PERFORM
F. CONFIGURATION & FINISH OF ACCESS HOLES.	OBSERVE
G. FIT-UP OF FILLET WELDS: • DIMS. (FILLET SIZE) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELDER QUALIFICATION & LOCATION)	OBSERVE
3. INSPECTION TASKS DURING WELDING:	
A. STRUCTURAL STEEL & COLD-FORMED STEEL DECK:	
1) COMPLETE & PARTIAL PENETRATION GROOVE WELDS.	PERFORM
2) MULTIPASS FILLET WELDS.	PERFORM
3) SINGLE-PASS FILLET WELDS ≤ 5/16".	PERFORM
4) PLUG & SLOT WELDS.	PERFORM
5) SINGLE-PASS FILLET WELDS ≤ 5/16".	PERFORM
6) FLOOR & ROOF DECK WELDS.	OBSERVE
B. USE OF QUALIFIED WELDERS.	OBSERVE
C. CONTROL & HANDLING OF WELDING CONSUMABLES: • EXPOSURE CONTROL • PACKAGING	OBSERVE
D. NO WELDING OVER CRACKED TACK WELDS.	OBSERVE
E. ENVIRONMENTAL CONDITIONS: • WIND SPEED WITHIN LIMITS • PRECIPITATION & TEMP.	OBSERVE
F. WPS FOLLOWED: • SETTINGS ON WELDING EQPT. • TRAVEL SPEED • SELECTED WELDING MATERIALS • PREHEAT APPLIED • INTERPASS TEMP. MAINTAINED (MIN / MAX) • PROPER POSITION (F, V, H, OH)	OBSERVE
G. WELDING TECHNIQUES: • INTERPASS & FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS	OBSERVE
4. INSPECTION TASKS AFTER WELDING.	
A. WELDS CLEANED.	OBSERVE
B. SIZE, LENGTHS & LOCATION OF WELDS.	PERFORM
C. WELDS MEET VISUAL ACCEPTANCE CRITERIA: • CRACK PROHIBITION • WELD SIZE • WELD SPACING • UNDERCUT • CRATER CROSS SECTION • POROSITY • WELD PROFILES	PERFORM
D. ULTRASONIC TESTING TO BE PERFORMED ON COMPLETE JOINT PENETRATION WELDS PER AWS D1.1-2015.	PERFORM
E. ARC STRIKES.	PERFORM
F. X-RAYS.	PERFORM
G. BACKING & WELD TABS REMOVED (IF REQ'D.).	PERFORM
H. REPAIR ACTIVITIES.	PERFORM
I. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER.	PERFORM
5. INSPECTION TASKS FOR BOLTING:	
A. MFR. CERTS. AVAILABLE FOR FASTENER MATERIALS.	PERFORM
B. FASTENERS MARKED IN ACCORDANCE w/ ASTM RQMTS.	OBSERVE
C. PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH, EXCLUDED THREADS).	OBSERVE
D. PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL.	OBSERVE
E. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION & HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE RQMTS.	OBSERVE
F. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED & DOCUMENTED FOR FASTENER ASSEMBLIES & METHODS USED.	OBSERVE
G. PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS & OTHER FASTENER COMPONENTS.	OBSERVE
6. INSPECTION TASKS DURING BOLTING:	
A. FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES & WASHERS (IF REQ'D) ARE PLACED AS REQ'D.	OBSERVE
B. JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION.	OBSERVE
C. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING.	OBSERVE
D. FASTENERS ARE PRETENSIONED IN ACCORDANCE w/ THE RCSC SPECIFICATION, METHODICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	OBSERVE
7. INSPECTION TASKS AFTER BOLTING:	
A. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNS.	OBSERVE
8. INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONST. PRIOR TO CONC. PLACEMENT:	
A. PLACEMENT & INSTALLATION OF STEEL DECK.	PERFORM
B. PLACEMENT & INSTALLATION OF STEEL HEADED STUD ANCHORS.	PERFORM
C. DOCUMENT ACCEPTANCE OR REJECTION OF STEEL ELEMENTS.	PERFORM
9. INSPECTION TASKS PRIOR TO MECHANICAL FASTENING OF DECK:	
A. MANUFACTURER INSTALLATION INSTRUCTIONS AVAILABLE.	OBSERVE
B. PROPER TOOLS AVAILABLE FOR FASTENER INSTALLATION.	OBSERVE
C. PROPER STORAGE FOR MECHANICAL FASTENERS.	OBSERVE
10. INSPECTION TASKS DURING MECHANICAL FASTENING OF DECK:	
A. FASTENERS ARE POSITIONED AS REQUIRED.	OBSERVE
B. FASTENERS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RQMTS.	OBSERVE
11. INSPECTION TASKS AFTER MECHANICAL FASTENING OF DECK:	
A. CHECK SPACING, TYPE AND INSTALLATION OF SUPPORT, SIDELAP & PERIMETER FASTENERS.	PERFORM
B. VERIFY REPAIRS & DOCUMENT ACCEPTANCE/REJECTION OF FASTENERS.	PERFORM
OPEN-WEB STEEL JOISTS AND JOIST GIRDERS	
1. INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS:	
A. END CONNECTIONS - WELDING OR BOLTED	PERIODIC
B. BRIDGING - HORIZONTAL OR DIAGONAL.	PERIODIC
CONCRETE	
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, & VERIFY PLACEMENT.	PERIODIC
2. INSPECTION PRIOR TO WELDING BAR WELDING:	
A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706.	PERIODIC
B. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16".	PERIODIC
C. INSPECT ALL OTHER WELDS.	CONT.
3. INSPECT ANCHORS CAST IN CONCRETE.	PERIODIC
4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS:	
A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	CONT.
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.	PERIODIC
5. VERIFY USE OF REQUIRED DESIGN MIX.	PERIODIC
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP & AIR CONTENT TESTS AND DETERMINE CONCRETE TEMPERATURE.	CONT.
7. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	CONT.
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE & TECHNIQUES.	PERIODIC
9. INSPECT PRECAST CONCRETE FOR:	
A. APPLICATION OF PRESTRESSING FORCES.	CONT.
B. GROUTING OF BONDED PRESTRESSING TENDONS.	CONT.
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	PERIODIC
11. VERIFY OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST TENSIONED CONCRETE & PRIOR TO REMOVAL OF SHORES & FORMS FROM BEAMS & STRUCTURAL SLABS.	PERIODIC
12. INSPECT FORMWORK FOR SHAPE, LOCATION & DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	PERIODIC
MASONRY - LEVEL B - CONFORM TO TMS 402 & 602 REQUIREMENTS	
1. VERIFY COMPLIANCE WITH THE APPROVED SUBMITTALS	PERIODIC
2. VERIFICATION OF f'm IN ACCORDANCE w/ MSJC ARTICLE 1.4B PRIOR TO CONSTRUCTION EXCEPT WHERE SPECIFICALLY EXEMPTED BY THE IBC.	PERIODIC
3. VERIFICATION OF SLUMP FLOW & VSI AS DELIVERED TO THE SITE IN ACCORDANCE w/ MSJC ARTICLE 1.5.B.1.b-3 FOR SELF-CONSOLIDATING GROUT.	PERIODIC
4. AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:	
A. PROPORTIONS OF SITE-PREPARED MORTAR.	PERIODIC
B. CONSTRUCTION OF MORTAR JOINTS.	PERIODIC
C. LOCATION OF REINFORCEMENT & CONNECTORS.	PERIODIC
5. PRIOR TO GROUTING, VERIFY THE FOLLOWING ARE IN COMPLIANCE:	
A. GROUT SPACE.	PERIODIC
B. GRADE, TYPE, & SIZE OF REINFORCEMENT & ANCHOR BOLTS	PERIODIC
C. PLACEMENT OF REINFORCEMENT & CONNECTORS.	PERIODIC
D. PROPORTIONS OF SITE-PREPARED GROUT.	PERIODIC
E. CONSTRUCTION OF MORTAR JOINTS.	PERIODIC
6. VERIFY DURING CONSTRUCTION:	
A. SIZE & LOCATION OF STRUCTURAL ELEMENTS.	PERIODIC
B. TYPE, SIZE & LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES OR OTHER CONSTRUCTION.	PERIODIC
C. WELDING OF REINFORCING BARS.	CONT.
D. PREPARATION, CONSTRUCTION & PROTECTION OF MASONRY DURING COLD WEATHER (TEMP. BELOW 40°F) OR HOT WEATHER (TEMP. ABOVE 90°F).	PERIODIC
E. PLACEMENT OF GROUT.	CONT.
7. OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS &/OR PRISMS.	PERIODIC
SOILS	
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	PERIODIC
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH & HAVE REACHED PROPER MATERIAL.	PERIODIC
3. PERFORM CLASSIFICATION & TESTING OF COMPACTED FILL MATERIALS.	PERIODIC
4. VERIFY USE OF PROPER MATERIALS, DENSITIES & LIFT THICKNESSES DURING PLACEMENT & COMPACTION OF COMPACTED FILL.	CONT.
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE & VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	PERIODIC

PROGRAM CONTENTS:
1. THE ITEMS INDICATED ABOVE SHALL BE INSPECTED IN ACCORDANCE WITH CHAPTER 17 OF THE IBC BY A CERTIFIED SPECIAL INSPECTOR FROM AN ESTABLISHED TESTING AGENCY. FOR MATERIAL SAMPLING AND TESTING REQUIREMENTS, REFER TO THE PROJECT SPECIFICATIONS & THE SPECIFIC STRUCTURAL NOTES SECTIONS. THE TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING & INSPECTION REPORTS DIRECTLY TO THE ARCHITECT, STRUCTURAL ENGINEER, CONTRACTOR, & BUILDING OFFICIAL. ANY MATERIALS WHICH FAIL TO MEET THE PROJECT SPECIFICATIONS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. SPECIAL INSPECTION TESTING REQUIREMENTS APPLY EQUALLY TO ALL BIDDER DESIGNED COMPONENTS.
2. **CONT** - CONTINUOUS SPECIAL INSPECTION. SPECIAL INSPECTOR IS PRESENT WHEN & WHERE THE WORK TO BE INSPECTED IS BEING PERFORMED. (IBC SECTION 1702).
3. **PERIODIC** - PERIODIC SPECIAL INSPECTION. SPECIAL INSPECTOR IS INTERMITTENTLY PRESENT WHERE THE WORK TO BE INSPECTED HAS BEEN OR IS BEING PERFORMED.
4. **OBSERVE** - SPECIAL INSPECTOR SHALL OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS (AISC 360 SECTION N5).
5. **PERFORM** - SPECIAL INSPECTOR SHALL PERFORM THESE TASKS FOR EACH JOINT, CONNECTION, ELEMENT OR MEMBER (AISC 360 SECTION N5).
6. SPECIAL INSPECTION IS NOT REQUIRED FOR WORK PERFORMED BY AN APPROVED FABRICATOR (IBC SECTION 1704.2.2).
7. ALL WELDS SHALL BE VISUALLY INSPECTED.
8. CJP WELDS SHALL BE ULTRASONICALLY OR BY SIMILAR APPROVED METHOD.
9. WHERE SHOP FABRICATED CONSTRUCTION SHALL BE THE SAME AS IF THE MATERIAL USED IN THE CONSTRUCTION TOOK PLACE ON SITE, CONTINUOUS INSPECTION WILL NOT BE REQUIRED DURING PREFABRICATION IF THE APPROVED AGENCY CERTIFIES THE CONSTRUCTION AND FURNISHES EVIDENCE OF COMPLIANCE.
10. ALL ELEMENTS OF THE WOOD FRAMED LATERAL LOAD RESISTING SYSTEM SHALL BE VISUALLY INSPECTED.

CN CONCRETE NOTES
CN1 CONCRETE WORK SHALL CONFORM TO CHAPTER 19 OF THE IBC.

CN2 WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHALL BE CLEANED AND ROUGHENED TO A MINIMUM OF 1/4" AMPLITUDE.

CN3 ALL EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED 3/4" U.N.O.

CN4 CONCRETE FORMWORK:
- CN4.1 SLEEVES, OPENINGS, CONDUIT, AND OTHER EMBEDDED ITEMS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO POURING CONCRETE. CONDUITS EMBEDDED IN SLABS SHALL BE LIMITED TO MAXIMUM OUTSIDE DIMENSION THAN ONE THIRD OF THE THICKNESS OF THE SLAB AND SHALL NOT BE PLACED CLOSER THAN THREE DIAMETERS ON CENTER.
- CN4.2 VERIFY ALL BLOCK OUTS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS PRIOR TO POURING.

CN5 CONCRETE REINFORCEMENT:
- CN5.1 DETAILING, FABRICATION, AND PLACEMENT OF REINFORCEMENT SHALL CONFORM TO ACI-315.
- CN5.2 ALL REINFORCEMENT TO BE ASTM A615 GRADE 60 U.N.O. WELDED WIRE FABRIC TO BE ASTM A185 WITH WIRE CONFORMING TO ASTM A82. REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE USING #16 ANNEALED IRON WIRE. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS.
- CN5.3 WELDING OF REINFORCING BARS SHALL BE SUPPLIED USING CLASS B TENSION SPLICES, U.N.O. CONTINUOUSLY WELDED SPLICES USING CLASS B TENSION SPLICES SHALL BE SPLICED USING CLASS B TENSION SPLICES, U.N.O.
- CN5.4 WHERE BEAMS AND SLABS ARE POURED MONOLITHICALLY, USE CONCRETE BLOCKS OR APPROVED METAL CHAIRS, AS SPECIFIED BY THE CRSI MANUAL OF STANDARD PRACTICE, MSP-1.
- CN5.5 CONTINUE HORIZONTAL WALL BARS THROUGH PILASTERS. COLUMNS, INTERSECTING WALLS AND INTERMEDIATE SUPPORTS. REFER TO TYPICAL DETAILS FOR LAYOUT OF CORNER BARS AND BARS IN SMALL WALL SECTIONS. SLAB BARS SHALL BE HOOKED INTO WALLS OR HOOKED DOWELS SHALL BE PROVIDED TO MATCH SLAB REINFORCING. PROVIDE #5 CORNER BARS AT ALL WALL INTERSECTIONS.
- CN5.6 ADD TWO DIAGONAL #5 BARS, FOUR FEET LONG, CENTERED, AT EACH CORN

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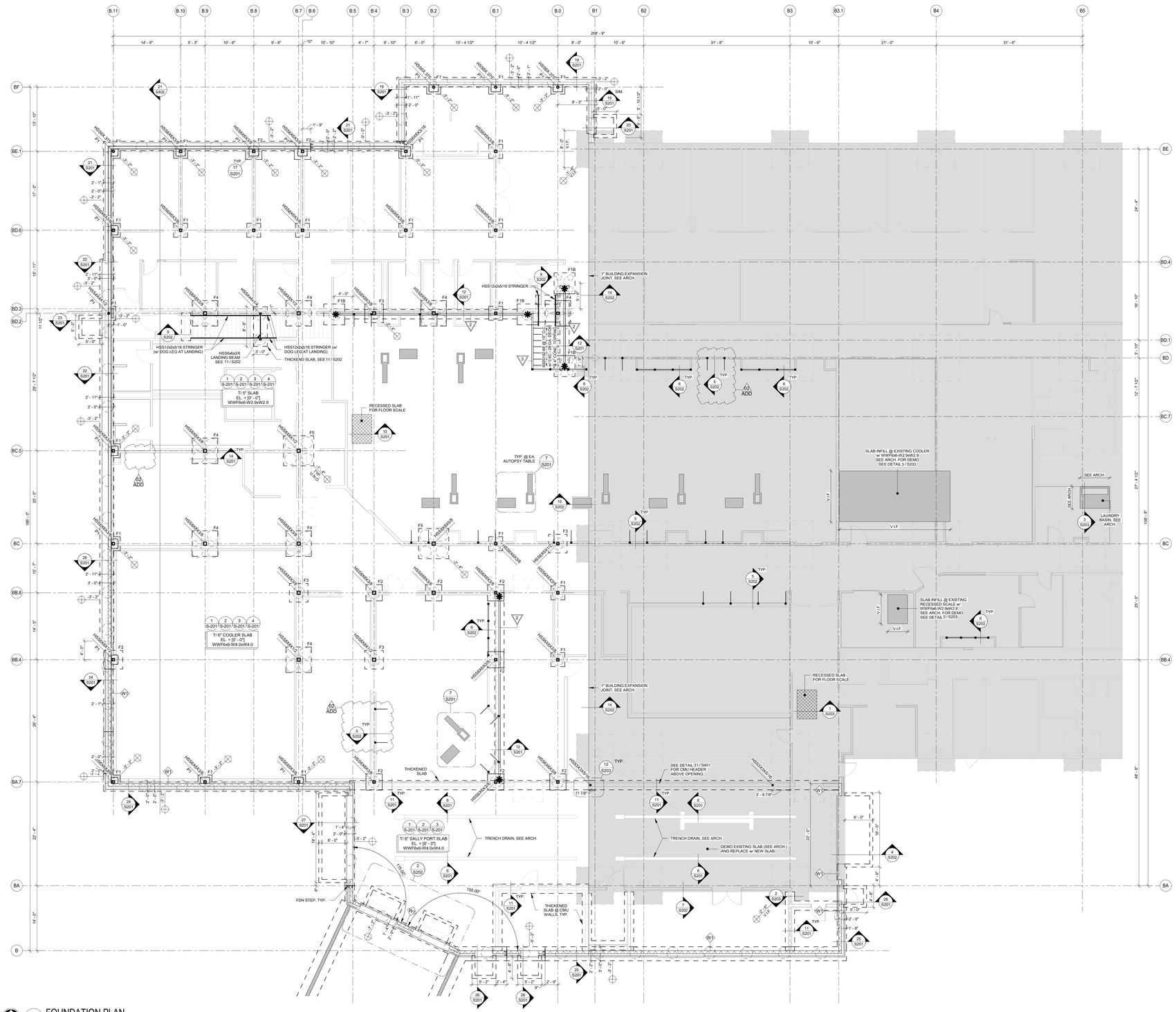

NORTH

A FOUNDATION PLAN
1/8" = 1'-0"

PLAN NOTES:
1. EXCEREXCAVATION AND BACKFILL REQUIRED TO ACHIEVE DESIGN BEARING PRESSURES. SEE FP/S001 & GEOTECHNICAL REPORT FOR ADD'L INFO.
2. CONTRACTOR TO COORDINATE DEPRESSED SLAB EXTENTS/DEPTHS w/ ARCH. & FLOORING MANUFACTURER.
3. CONTRACTOR TO FIELD VERIFY ALL RELEVANT EXISTING INFORMATION, INCLUSING EXISTING DIMENSIONS, CONDITIONS AND FRAMING.
4. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING AND/OR UNDERPINNING OF EXISTING STRUCTURE NEEDED TO ACCOMMODATE NEW CONSTRUCTION.
5. SEE SHEET S201 FOR TYPICAL FOUNDATION / SLAB DETAILS.
6. SEE SHEET S401 FOR TYPICAL CMU DETAILS.
7. THICKENED SLAB NOTED WITH ARCH. IS FOR REFERENCE ONLY. SEE ARCH. FOR SIZE & LOCATION.
   THICKENED SLAB REQ'D AT ALL NON-LOAD BEARING CMU WALLS. SEE DETAIL 11 / S201
8. PX - INDICATES CONCRETE PIER. SEE PIER SCHEDULE FOR INFORMATION. T/ PIER = -0'-8" U.N.O.
9. FX - INDICATES CONCRETE FOOTING. SEE FOOTING SCHEDULE FOR INFORMATION.
10. ⊨ - INDICATES T/TG STEP. SEE _7 / S203 FOR TYPICAL REINFORCEMENT AT STEPS.
11. CONTRACTOR TO PROVIDE A RAMMED AGGREGATE PIER (R.A.P.) SYSTEM, OR APPROVED EQUIVALENT, TO ACHIEVE A MINIMUM 5,000 PSF BEARING PRESSURE.
12. CONTRACTOR TO SEE ARCH. FOR LOCATION OF NEW GENERATOR & PAD. SEE DETAIL 9 / S203 FOR PAD CONSTRUCTION.

COLD-FORMED SHEAR WALL SCHEDULE

MARK	1 6" WALL - PENTHOUSE	2 3-5/8" SHEAR WALL	3 3-5/8" BEARING WALL	4 8" WALL
STUD SIZE AND SPACING	600S162-54 STUDS @ 16" O.C.	362S162-54 STUDS @ 16" O.C.	362S162-54 STUDS @ 16" O.C.	800S200-54 STUDS @ 16" O.C.
SHEATHING TYPE	15/32" OSB - EXTERIOR	15/32" OSB - ONE SIDE	SEE ARCH.	15/32" OSB - EXTERIOR
BLOCKED OR UNBLOCKED	BLOCKED	BLOCKED	-	BLOCKED
SCREWS @ 6" O.C. ALL PANEL EDGES, TOP & BOTTOM TRACKS & BLOCKING, U.N.O. SCREWS @ 12" O.C. MAX. IN THE FIELD (ALL PANEL EDGES TO BE BLOCKED WITH 2" OR WIDER STRAPPING, U.N.O.) SCREWS SHALL BE 3/8" FROM PANEL EDGE.	#10, FLAT HEAD (MIN. HEAD Ø 0.333")	#10, FLAT HEAD (MIN. HEAD Ø 0.333")	-	#10, FLAT HEAD (MIN. HEAD Ø 0.333")
BOTTOM TRACK CONNECTION TO SLAB	(1)-HILTI 0.145 PDF @ EA. STUD	(1)-HILTI 0.145 PDF @ EA. STUD	(1)-HILTI 0.145 PDF @ EA. STUD	-
BOTTOM TRACK CONNECTION TO BEAM	(1)-HILTI 0.145 PDF @ EA. STUD	(1)-HILTI 0.145 PDF @ EA. STUD	-	(1)-HILTI 0.145 PDF @ EA. STUD
HOLD DOWN @ EA. END OF WALL (LOCATIONS SHOWN AS ✱ ON PLAN) HILTI HIT-HY 200 ADHESIVE w/ THREADED HAS ROD, U.N.O. SEE DETAIL 13 / S201	(4) 3/4" Ø x 4 1/2" HILTI KWIK-EZ ANCHORS @ 3" O.C.	SIMPSON SHDU6 w/ (12)-#14 SCREWS w/ 5/8" Ø HILTI HAS ROD (1'-0" EMBED.)	-	-

NOTES:
1) SEE ARCH. DRAWINGS FOR NON-STRUCTURAL COMPONENTS (I.E. GYP. BOARD, RESILIENT CHANNELS, ETC.).
2) SEE DETAIL 19 / S401 FOR TYPICAL LT. GA. SHEAR WALL ASSEMBLY.

CMU WALL SCHEDULE

MARK	MATERIAL	WALL SIZE	VERT. REINFORCEMENT	NOTES
W1	CMU	8"	VERT. REINF: #5 @ 48" O.C. HORIZ. REINF.: LADDER TYPE @ 16" O.C.	---

FOOTING SCHEDULE

MARK	DIMENSIONS	DETAILS	NOTES
F1	3'-0" x 3'-0" x 1'-0"	(4)-#5 E.W. BOTTOM	---
F1B	4'-6" x 4'-6" x 2'-0"	(5)-#5 E.W. TOP & BOTTOM	---
F2	3'-6" x 3'-6" x 1'-0"	(4)-#5 E.W. BOTTOM	---
F2B	5'-0" x 5'-0" x 3'-6"	(6)-#5 E.W. TOP & BOTTOM	---
F3	4'-0" x 4'-0" x 1'-3"	(5)-#5 E.W. BOTTOM	---
F4	5'-6" x 5'-6" x 1'-6"	(7)-#5 E.W. BOTTOM	---
F5	6'-6" x 6'-6" x 2'-0"	(11)-#5 E.W. BOTTOM	---

PIER SCHEDULE

MARK	SIZE	REINFORCEMENT
P1	24" x 24"	(6)-#8 VERT. BARS #3 TIES @ 12" O.C.

FOUNDATION SYMBOL KEY
- T/ WALL/ STEEL
- T/ FOOTING
- JOIST BEARING
- T/ BRICK LEDGE
- FDN. STEP
- EXIST. BLDG.

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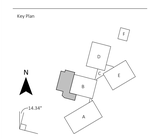
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. **23825001**
SOI Project No. **9429.00**

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

Sheet Name
FOUNDATION PLAN

Sheet Number
S101B

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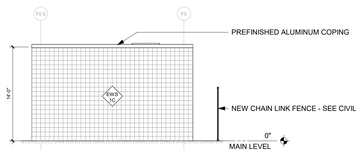
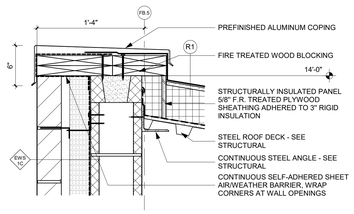
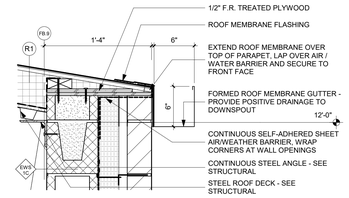


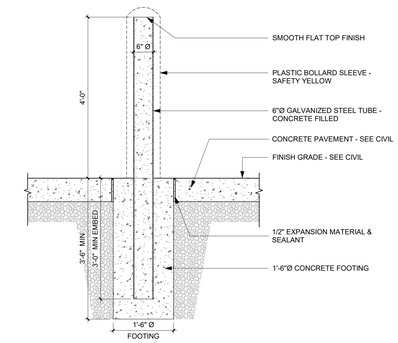
U1 EXTERIOR ELEVATION - PUMP HOUSE - NORTH
1/8" = 1'-0"



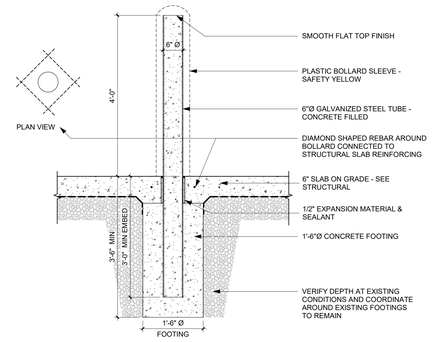
U7 SECTION DETAIL - PUMP HOUSE COPING
1 1/2" = 1'-0"



U12 SECTION DETAIL - PUMP HOUSE GUTTER
1 1/2" = 1'-0"



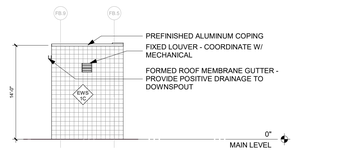
U17 DETAIL - EXTERIOR BOLLARD
3/4" = 1'-0"



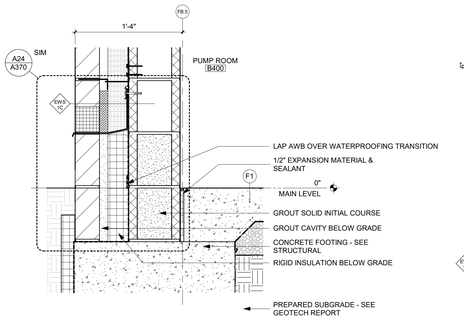
U23 DETAIL - INTERIOR BOLLARD
3/4" = 1'-0"

KEYNOTE LEGEND

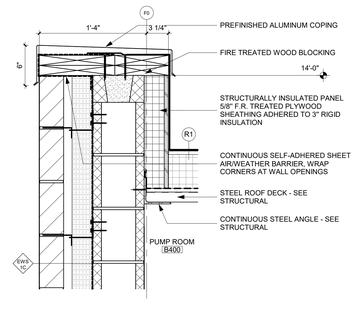
03 05.B1	PREPARED SUBGRADE - SEE GEOTECH REPORT
03 05.C1	GRANULAR BACK FILL - SEE GEOTECH REPORT
03 31.A2	CONCRETE FOOTING - SEE STRUCTURAL
03 31.B2	6" SLAB ON GRADE - SEE STRUCTURAL
04 05.D1	MASONRY ANCHOR @ 16" O.C. HORIZ. & 16" VERT., TYP.
05 12.B1	STEEL BEAM - SEE STRUCTURAL
05 12.G1	CONTINUOUS STEEL ANGLE - SEE STRUCTURAL
05 31.A1	STEEL ROOF DECK - SEE STRUCTURAL
06 05.B1	FIRE TREATED WOOD BLOCKING
06 16.A11	1/2" F.R. TREATED PLYWOOD
06 16.D1	STRUCTURALLY INSULATED PANEL 5/8" F.R. TREATED PLYWOOD SHEATHING ADHERED TO 3" RIGID INSULATION
07 14.A1	CONTINUOUS FLUID APPLIED WATER PROOFING
07 21.A4	2" RIGID PERIMETER INSULATION & PROTECTION BOARD
07 27.A2	CONTINUOUS SELF-ADHERED SHEET AIR/WEATHER BARRIER, WRAP CORNERS AT WALL OPENINGS
07 50ID	EXTEND ROOF MEMBRANE OVER TOP OF PARAPET, LAP OVER AIR / WATER BARRIER AND SECURE TO FRONT FACE
07 54.A1	ROOF MEMBRANE
07 54.B1	ROOF MEMBRANE FLASHING
07 62.F2	PREFINISHED ALUMINUM OPEN FACED DOWNSPOUT - 6" X 6" - DRAINAGE TO GRADE - PROVIDE CONCRETE SPLASHBLOCK
07 62.F3	FORMED ROOF MEMBRANE GUTTER - PROVIDE POSITIVE DRAINAGE TO DOWNSPOUT
07 71.A1	PREFINISHED ALUMINUM COPING
07 71.E1	TERMINATION BAR AND SEALANT, FASTENED 8" O.C. - TOOLED BEAD OF SEALANT
07 72.A3	ROOF HATCH - 4'-0" X 4'-0" - INSULATED - COORDINATE LOCATION W/MECHANICAL
07 95.B1	1/2" EXPANSION MATERIAL & SEALANT
08 91.C1	FIXED LOUVER - COORDINATE W/ MECHANICAL
31 61.A1	DEEP FOUNDATION SYSTEM - SEE STRUCTURAL
32 13.B1	CONCRETE PAVEMENT - SEE CIVIL
32 31.B1	NEW CHAIN LINK FENCE - SEE CIVIL



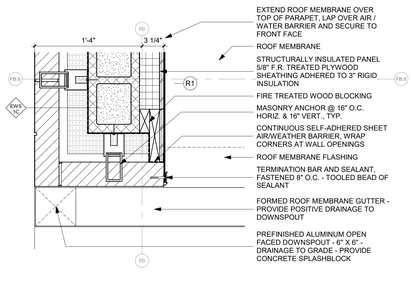
R1 EXTERIOR ELEVATION - PUMP HOUSE - EAST
1/8" = 1'-0"



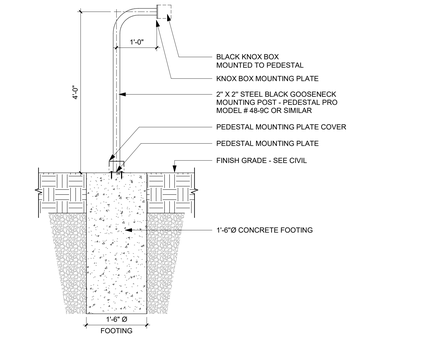
P7 SECTION DETAIL - PUMP HOUSE WALL BASE
1 1/2" = 1'-0"



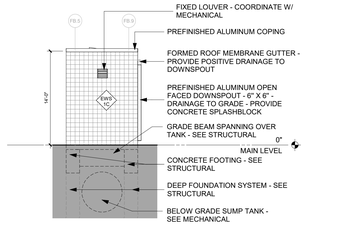
P12 SECTION DETAIL - PUMP HOUSE PARAPET
1 1/2" = 1'-0"



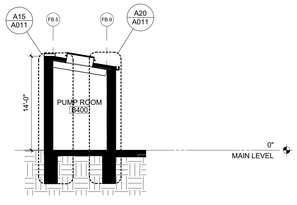
P17 PLAN DETAIL - PUMP HOUSE PARAPET / GUTTER TRANSITION
1 1/2" = 1'-0"



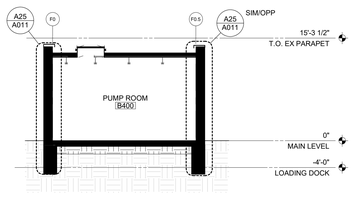
P23 DETAIL - KNOX BOX PEDESTAL
3/4" = 1'-0"



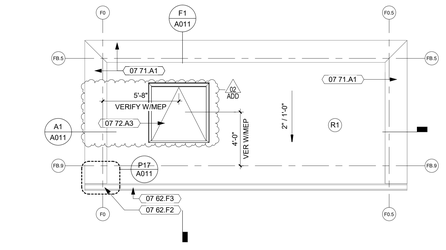
K1 EXTERIOR ELEVATION - PUMP HOUSE - WEST
1/8" = 1'-0"



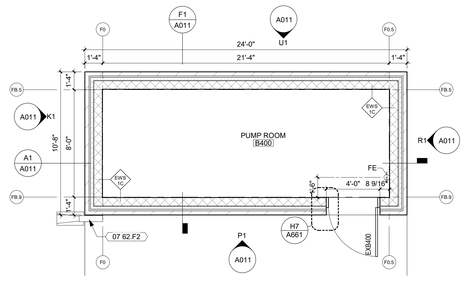
F1 BUILDING SECTION - PUMP HOUSE N/S
1/8" = 1'-0"



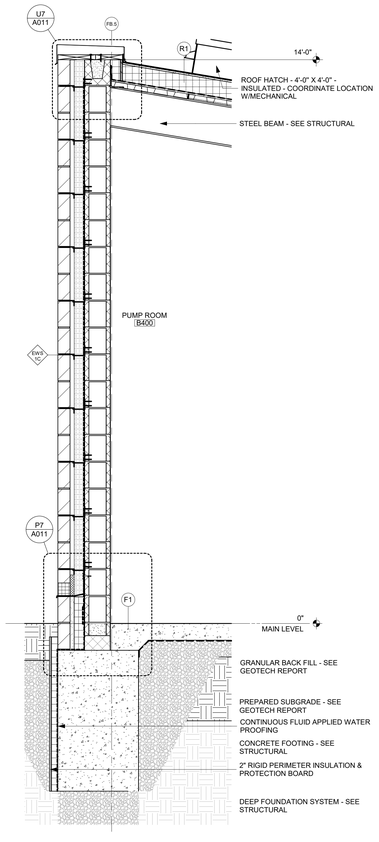
A1 BUILDING SECTION - PUMP HOUSE E/W
1/8" = 1'-0"



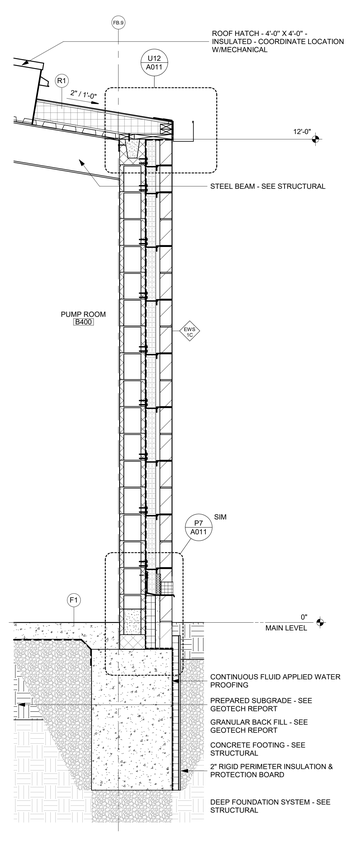
H7 ROOF PLAN - PUMP HOUSE
1/4" = 1'-0"



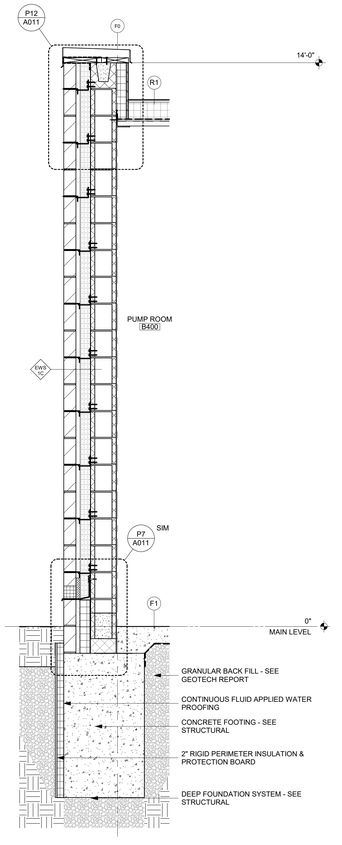
A7 ENLARGED PLAN - PUMP HOUSE
1/4" = 1'-0"



A15 WALL SECTION - PUMP HOUSE NORTH
3/4" = 1'-0"



A20 WALL SECTION - PUMP HOUSE SOUTH
3/4" = 1'-0"



A25 WALL SECTION - PUMP HOUSE WEST
3/4" = 1'-0"

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Key Plan

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No.
23825001

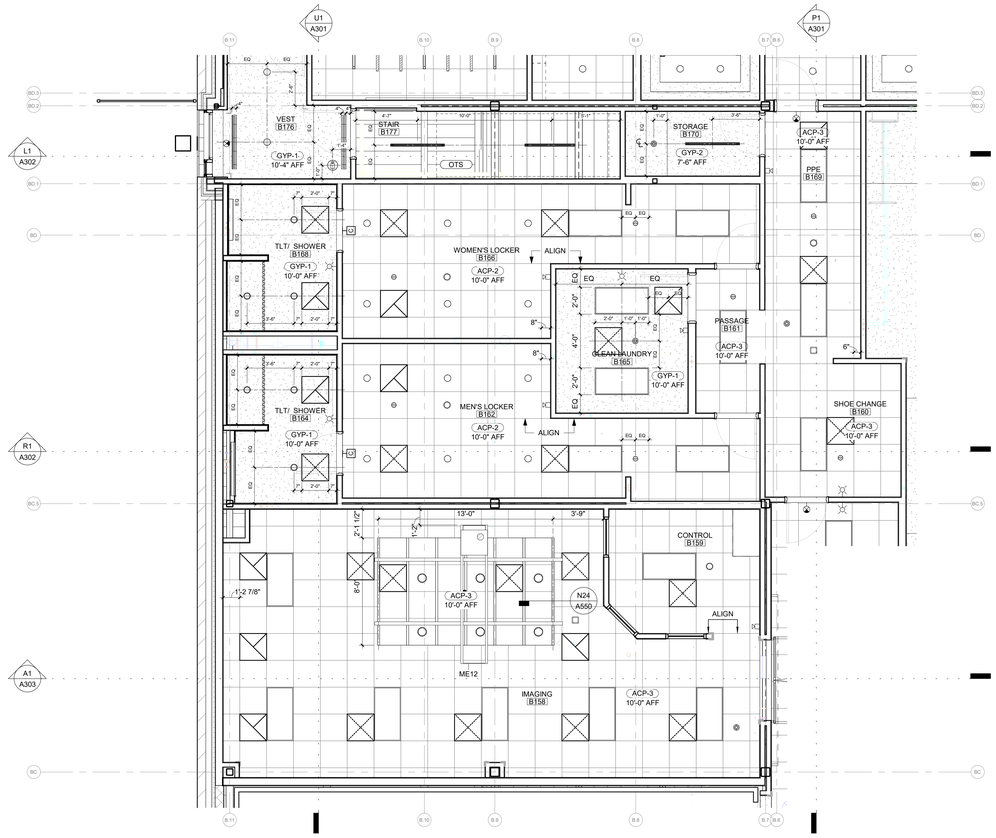
SOS Project No.
9429.00

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

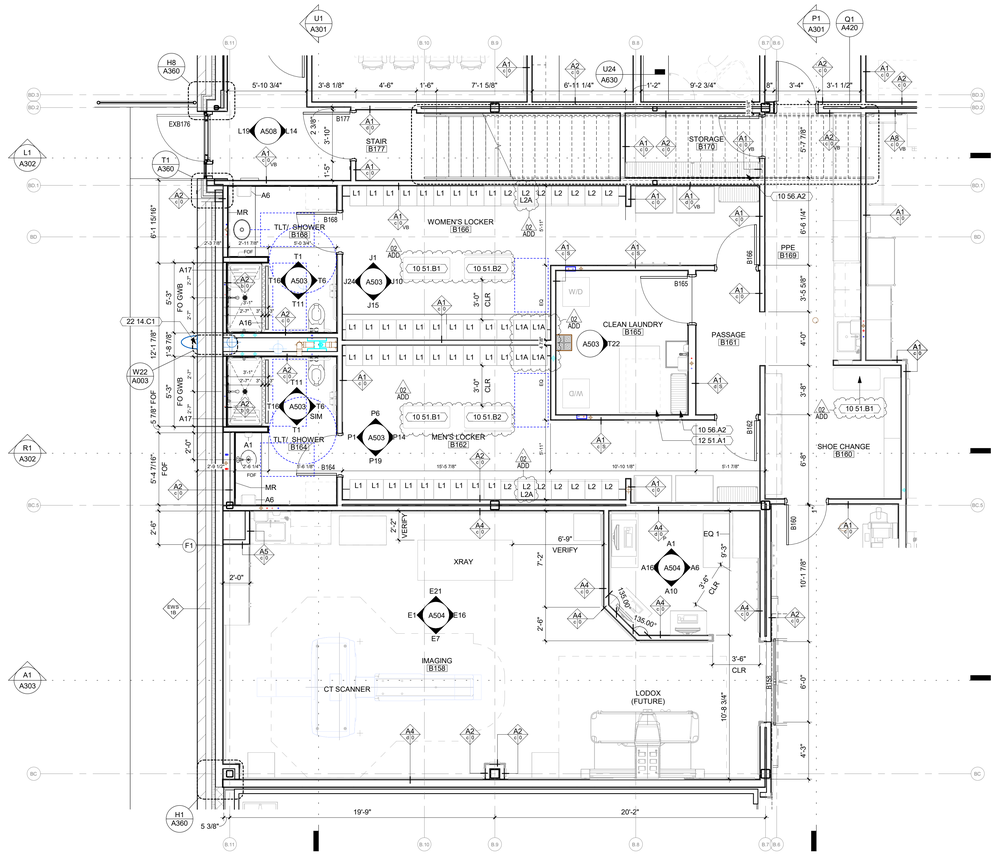
Sheet Name
PUMP HOUSE & DETAILS

Sheet Number
A011

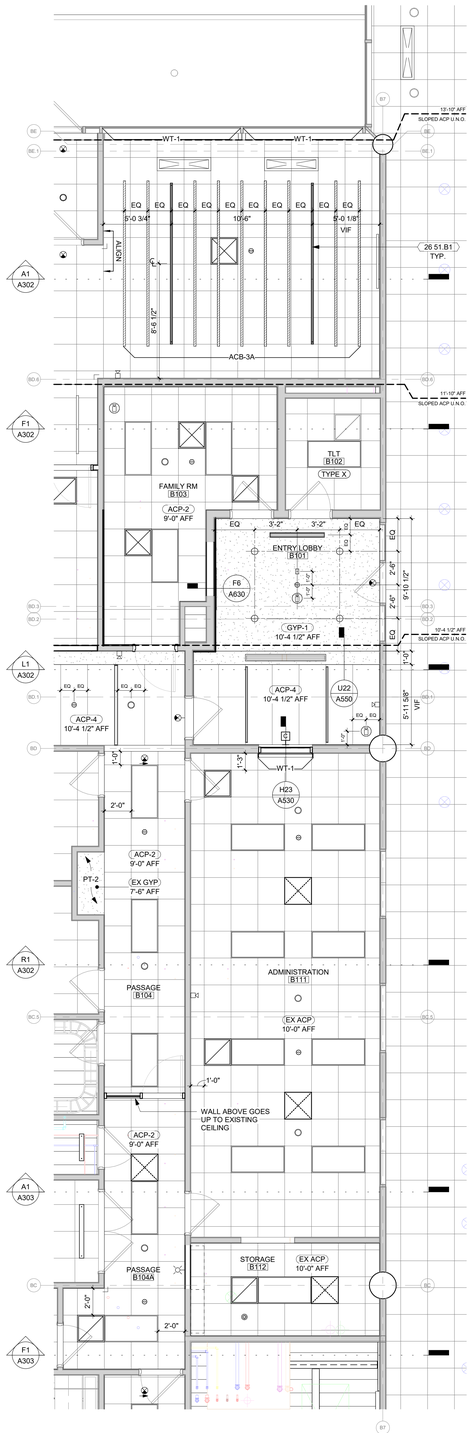
PRINTED: 12/4/2025 11:10:13 AM



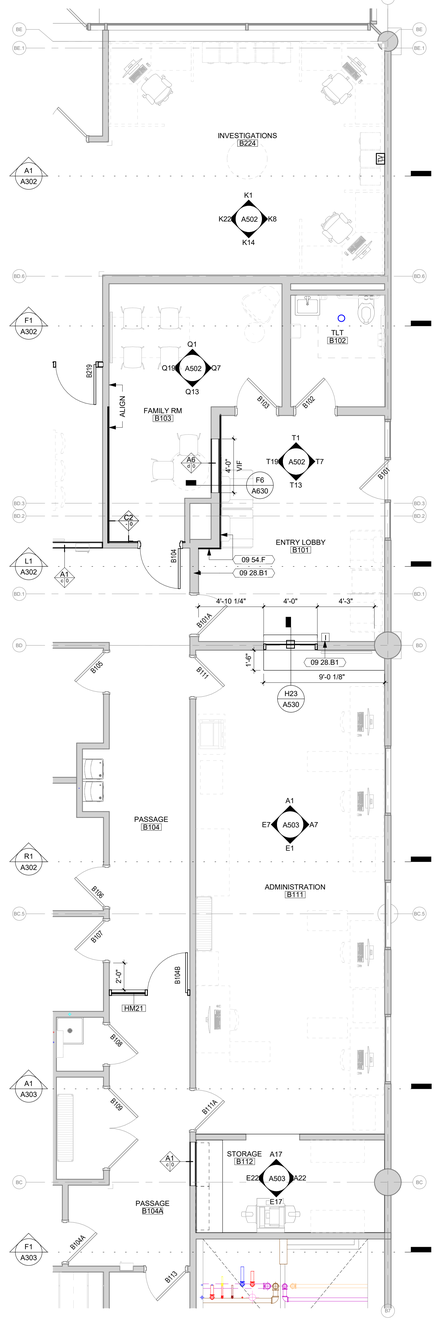
N1 ENLARGED RCP - LOCKER ROOM/ IMAGING
1/4" = 1'-0"



A1 ENLARGED PLAN - LOCKER ROOM/ IMAGING
1/4" = 1'-0"



A15 ENLARGED RCP - LOBBY & ADMIN SUITE
1/4" = 1'-0"



A21 ENLARGED PLAN - LOBBY & ADMIN SUITE
1/4" = 1'-0"

CEILING LEGEND

- ACCESS PANEL
- RECTANGULAR FIXTURE
- LINEAR FIXTURE
- DOWN LIGHTS
- LINEAR PENDANT
- DOWN LIGHT PENDANTS
- UTILITY LIGHTS
- CEILING & WALL MOUNT EXIT SIGNS
- HVAC SUPPLY DIFFUSER
- HVAC RETURN DIFFUSER
- HVAC EXHAUST DIFFUSER
- HVAC SLOT DIFFUSER
- HVAC ROUND DIFFUSER
- OCCUPANCY SENSOR
- SPEAKER
- MICROPHONE
- WIRELESS ACCESS POINT
- CEILING & WALL MOUNT CLOCK
- SMOKE DETECTOR
- CEILING & WALL MOUNT CAMERA
- SPRINKLER
- ACOUSTIC CEILING BAFFLES
- WIRELESS ACCESS POINT
- TELECOMMUNICATION DATA OUTLET
- HEAT DETECTOR
- FIRE HORN/ SPEAKER WITH STROBE
- FIRE STROBE

CEILING TYPES

ACP-1 (GRID REMAINS, REPLACE PANELS IN ALT #2)

MANUFACTURER:	USG
PANEL STYLE:	MARS™
PANEL EDGE:	SQUARE
SIZE:	2' X 2'
GRID:	EXISTING TO REMAIN
COLOR:	WHITE
GRID COLOR:	WHITE
APPLICATION:	SEE RCP

ACP-2

MANUFACTURER:	USG
PANEL STYLE:	HALCYON
PANEL EDGE:	SQUARE
SIZE:	2' X 2'
GRID:	USG CENTRICITEE DXT™
COLOR:	ACP-2: WHITE ACP-2A: BLACK
GRID COLOR:	ACP-2: WHITE ACP-2A: BLACK
APPLICATION:	SEE RCP

ACP-3

MANUFACTURER:	USG
PANEL STYLE:	SHEETROCK BRAND LAY-IN GYP PANELS
PANEL EDGE:	SQUARE W/ GASKET
SIZE:	2' X 2'
GRID:	USG DONN® BRAND DXACE™ ACOUSTICAL SUSPENSION SYSTEM W/ O1 HOLD DOWN CLIPS
COLOR:	WHITE
GRID COLOR:	WHITE
APPLICATION:	SEE RCP

ACP-4

MANUFACTURER:	USG
PANEL STYLE:	HALYCON
PANEL EDGE:	SQUARE
TRIM:	AXIOM
SIZE:	ACP-4: 2' X 6' ACP-4A: 2' X 8'
GRID:	USG DONN® BRAND DXADXL 15/16"
COLOR:	WHITE
GRID COLOR:	WHITE
APPLICATION:	SEE RCP

GYP-1
GYPSUM BOARD CEILING ON 3 5/8" METAL STUD FRAMING

GYP-2
1 HOUR RATED GYPSUM BOARD CEILING - SEE ASSEMBLY

ACB-1

MANUFACTURER:	ACOUFELT
STYLE:	VERSIFORM BAFFLES
SIZE:	VARIES (SEE RCP)
THICKNESS:	2"
COLOR:	WINE BARREL WQ03
MOUNTING:	THREADED ROD TO UNISTRUT & CABLE TO T-GRID
APPLICATION:	BREAK ROOM
CONTACT:	KYLA PETERSON (248) 429-5938

ACB-2

MANUFACTURER:	ACOUFELT
STYLE:	LINEAR BAFFLES
SIZE:	9"H X 52"L
THICKNESS:	2"
COLOR:	UMBER UM54
MOUNTING:	CABLE TO T-GRID
APPLICATION:	CORRIDOR
CONTACT:	KYLA PETERSON (248) 429-5938

ACB-3

MANUFACTURER:	ACOUFELT
STYLE:	LINEAR BAFFLES
SIZE:	A. 9"H X 148"L B. 9"H X 100"L C. 9"H X 76"L D. 9"H X 34"L E. 9"H X 24"L
THICKNESS:	2"
COLOR:	PISTACHIO PI25
MOUNTING:	CABLE TO T-GRID
APPLICATION:	OPEN OFFICES & CONFERENCE ROOM
CONTACT:	KYLA PETERSON (248) 429-5938

TYPE X
EXISTING CEILING TO REMAIN
- PAINT UNLESS NOTED OTHERWISE

KEYNOTE LEGEND

09 28.B1	MAINTAIN BULLET RESISTANT WALL DETAILS AT NEW DEVICES IN EXISTING WALL
09 54.F	WOOD PANELING - SEE ELEVATIONS
10 51.B1	BUILT-IN BENCH
10 51.B2	BUILT-IN ADA BENCH
10 56.A2	SHELVING UNITS, OFOI
12 51.A1	MOVABLE TABLE, OFOI
22 14.C1	OVERFLOW DRAIN OUTLET - SEE PLUMBING
26 51.B1	SUSPENDED LIGHT FIXTURES - SEE ELECTRICAL

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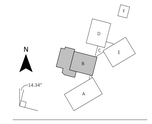
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

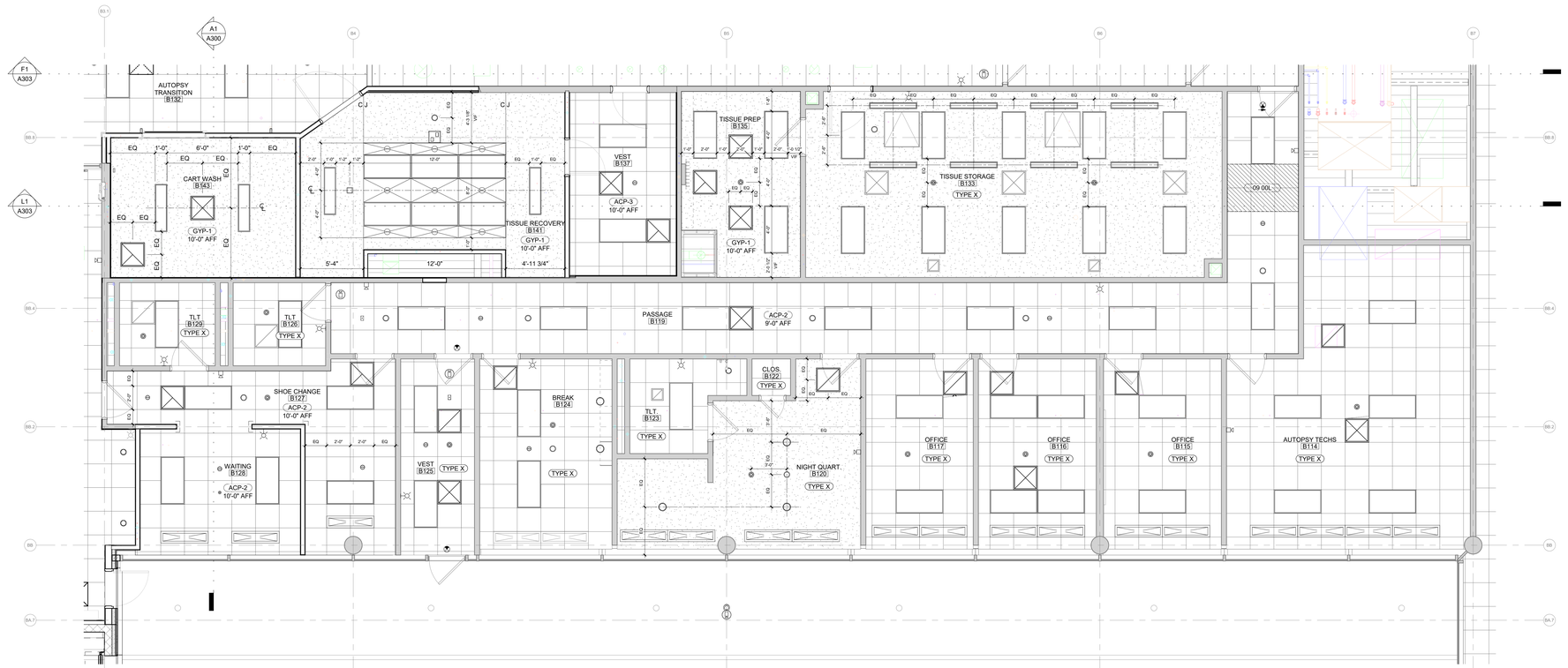
OPN Project No.: **23825001**
SOM Project No.: **9429.00**

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

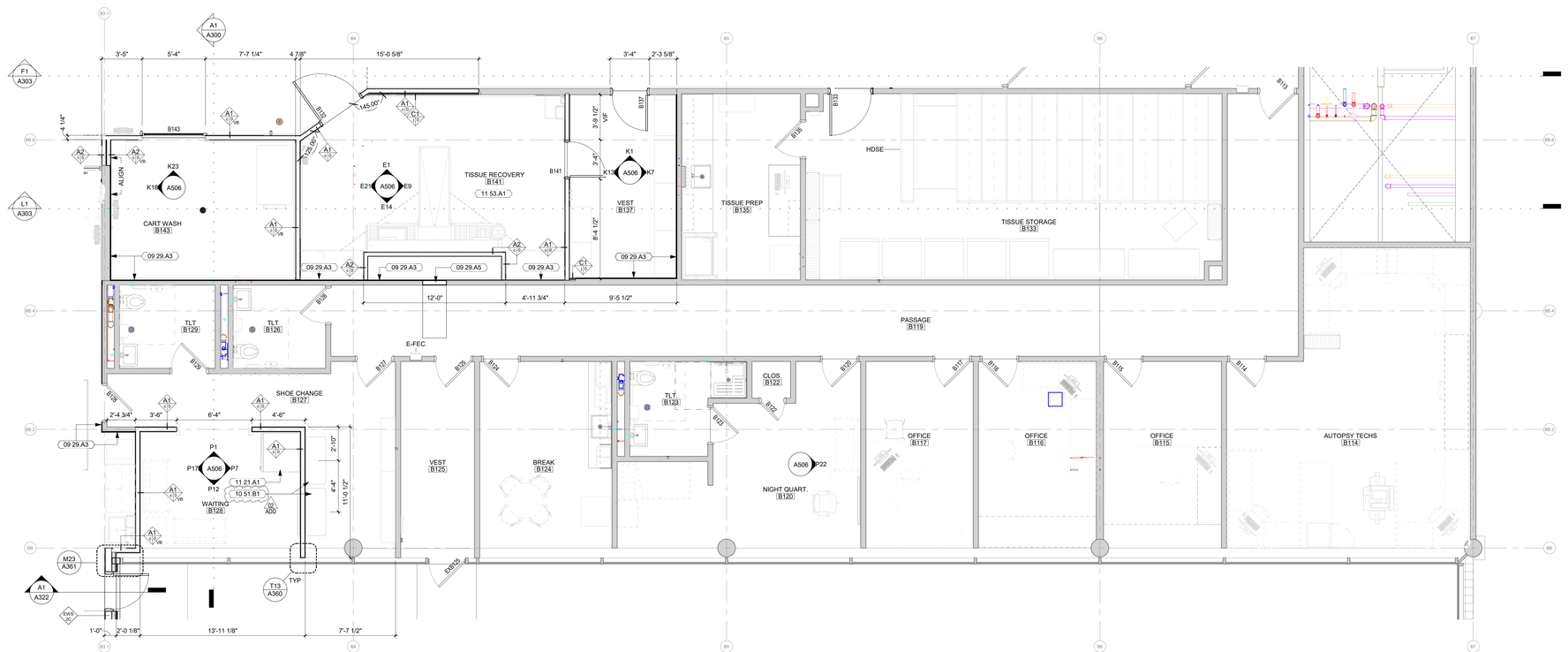
Sheet Name
ENLARGED PLAN & RCP - LOCKER ROOM/ IMAGING & LOBBY/ ADMIN SUITE

A402

PRINTED: 12/4/2025 11:10:52 AM



M1 ENLARGED RCP - SOUTH OFFICES & LAB
1/4" = 1'-0"



B1 ENLARGED PLAN - SOUTH OFFICES & LAB
1/4" = 1'-0"

CEILING LEGEND

- ACCESS PANEL
- RECTANGULAR FIXTURE
- LINEAR FIXTURE
- DOWN LIGHTS
- LINEAR PENDANT
- DOWN LIGHT PENDANTS
- UTILITY LIGHTS
- CEILING & WALL MOUNT EXIT SIGNS
- HVAC SUPPLY DIFFUSER
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- HVAC SLOT DIFFUSER
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- OCCUPANCY SENSOR
- SPEAKER
- MICROPHONE
- WIRELESS ACCESS POINT
- CEILING & WALL MOUNT CLOCK
- SMOKE DETECTOR
- CEILING & WALL MOUNT CAMERA
- SPRINKLER
- ACOUSTIC CEILING BAFFLES
- WIRELESS ACCESS POINT
- TELECOMMUNICATION DATA OUTLET
- HEAT DETECTOR
- FIRE HORN/ SPEAKER WITH STROBE
- FIRE STROBE

CEILING TYPES

ACP-1 (GRID REMAINS, REPLACE PANELS IN ALT #2)

MANUFACTURER:	USG
PANEL STYLE:	MARS™
PANEL EDGE:	SQUARE
SIZE:	2' X 2'
GRID:	EXISTING TO REMAIN
COLOR:	WHITE
GRID COLOR:	WHITE
APPLICATION:	SEE RCP

ACP-2

MANUFACTURER:	USG
PANEL STYLE:	HALCYON
PANEL EDGE:	SQUARE
SIZE:	2' X 2'
GRID	USG CENTRICITEE DXT™
COLOR:	ACP-2: WHITE ACP-2A: BLACK
GRID COLOR:	ACP-2: WHITE ACP-2A: BLACK
APPLICATION:	SEE RCP

ACP-3

MANUFACTURER:	USG
PANEL STYLE:	SHEETROCK BRAND LAY-IN GYP PANELS
PANEL EDGE:	SQUARE W/ GASKET
SIZE:	2' X 2'
GRID:	USG DONN® BRAND DXACE™ ACOUSTICAL SUSPENSION SYSTEM W/ O1 HOLD DOWN CLIPS
COLOR:	WHITE
GRID COLOR:	WHITE
APPLICATION:	SEE RCP

ACP-4

MANUFACTURER:	USG
PANEL STYLE:	HALYCON
PANEL EDGE:	SQUARE
TRIM:	AXIOM
SIZE:	ACP-4: 2' X 6' ACP-4A: 2' X 8'
GRID:	USG DONN DX/DXL 15/16"
COLOR:	WHITE
GRID COLOR:	WHITE
APPLICATION:	SEE RCP

GYP-1
GYPSUM BOARD CEILING ON 3 5/8" METAL STUD FRAMING

GYP-2
1 HOUR RATED GYPSUM BOARD CEILING - SEE ASSEMBLY

ACB-1

MANUFACTURER:	ACOUFELT
STYLE:	VERSIFORM BAFFLES
SIZE:	VARIES (SEE RCP)
THICKNESS:	2"
COLOR:	WINE BARREL WQ03
MOUNTING:	THREADED ROD TO UNISTRUT & CABLE TO T-GRID
APPLICATION:	BREAK ROOM
CONTACT:	KYLA PETERSON (248) 429-5938

ACB-2

MANUFACTURER:	ACOUFELT
STYLE:	LINEAR BAFFLES
SIZE:	9"H X 52"L
THICKNESS:	2"
COLOR:	UMBER UM54
MOUNTING:	CABLE TO T-GRID
APPLICATION:	CORRIDOR
CONTACT:	KYLA PETERSON (248) 429-5938

ACB-3

MANUFACTURER:	ACOUFELT
STYLE:	LINEAR BAFFLES
SIZE:	A. 9"H X 148"L B. 9"H X 100"L C. 9"H X 76"L D. 9"H X 34"L E. 9"H X 24"L
THICKNESS:	2"
COLOR:	PISTACHIO PI25
MOUNTING:	CABLE TO T-GRID
APPLICATION:	OPEN OFFICES & CONFERENCE ROOM
CONTACT:	KYLA PETERSON (248) 429-5938

TYPE X
EXISTING CEILING TO REMAIN
- PAINT UNLESS NOTED OTHERWISE

KEYNOTE LEGEND

09 00L	REMOVE CEILING TILES FOR ACCESS TO EXISTING CATWALK ABOVE - VERIFY LOCATION IN FIELD & COORDINATE FIXTURES/DEVICES WITH CATWALK ACCESS
09 29.A3	NEW 5/8" GYPSUM WALL BOARD W/ NEW VAPOR BARRIER
09 29.A5	WALL INFILL TO MATCH EXISTING WALL ASSEMBLY
02 ADD 10 51.B1	BUILT-IN BENCH
11 21.A1	VENDING MACHINES, BY OTHERS
11 53.A1	REFER TO LAB DRAWINGS & SPECIFICATIONS FOR LAYOUT & EQUIPMENT

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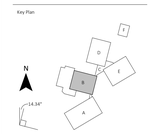
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

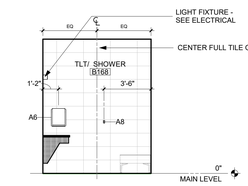
OPN Project No. **23825001**
SOI Project No. **9429.00**

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

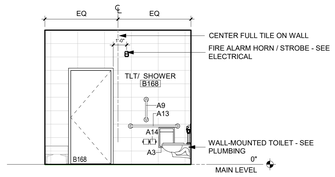
Sheet Name
ENLARGED PLAN & RCP - SOUTH OFFICES & LAB

Sheet Number
A405

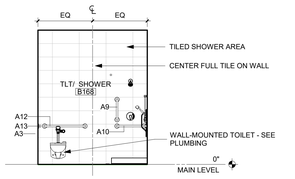
PRINTED: 12/4/2025 11:12:14 AM



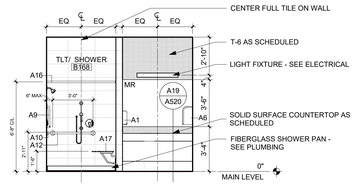
T1 INTERIOR ELEVATION - TLT/ SHOWER B168 - NORTH
1/4" = 1'-0"



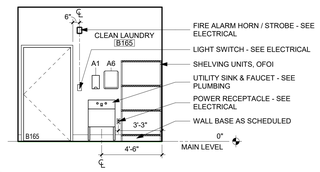
T6 INTERIOR ELEVATION - TLT/ SHOWER B168 - EAST
1/4" = 1'-0"



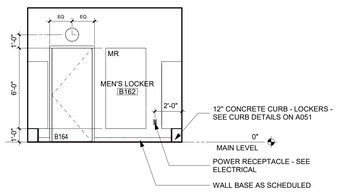
T11 INTERIOR ELEVATION - TLT/ SHOWER B168 - SOUTH
1/4" = 1'-0"



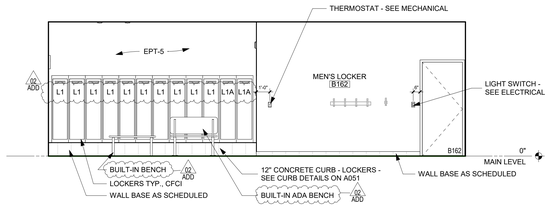
T16 INTERIOR ELEVATION - TLT/ SHOWER B168 - WEST
1/4" = 1'-0"



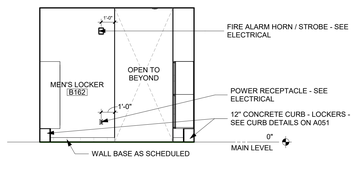
T22 INTERIOR ELEVATION - CLEAN LAUNDRY B165 - EAST
1/4" = 1'-0"



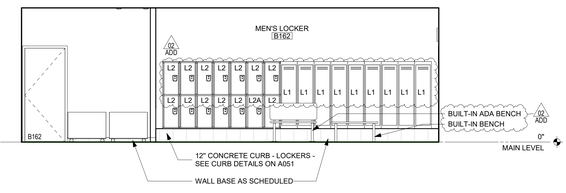
P1 INTERIOR ELEVATION - MEN'S LOCKER B162 - WEST
1/4" = 1'-0"



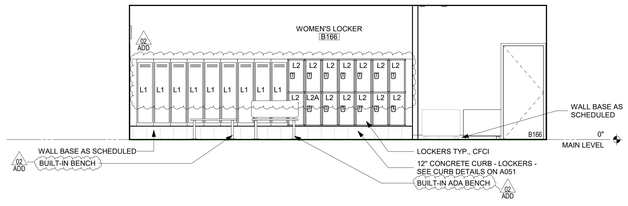
P6 INTERIOR ELEVATION - MEN'S LOCKER B162 - NORTH
1/4" = 1'-0"



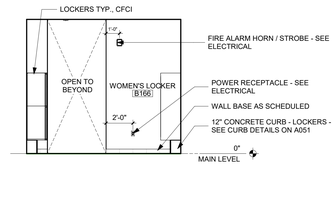
P14 INTERIOR ELEVATION - MEN'S LOCKER B162 - EAST
1/4" = 1'-0"



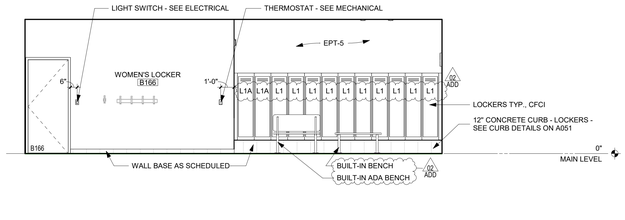
P19 INTERIOR ELEVATION - MEN'S LOCKER B162 - SOUTH
1/4" = 1'-0"



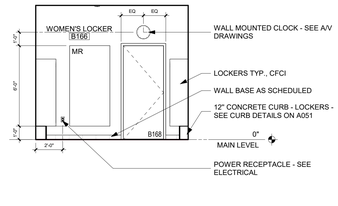
J1 INTERIOR ELEVATION - WOMEN'S LOCKER B166 - NORTH
1/4" = 1'-0"



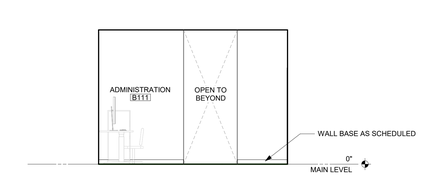
J10 INTERIOR ELEVATION - WOMEN'S LOCKER B166 - EAST
1/4" = 1'-0"



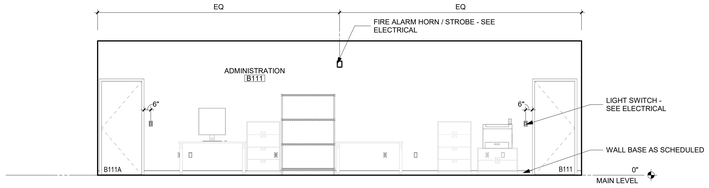
J15 INTERIOR ELEVATION - WOMEN'S LOCKER B166 - SOUTH
1/4" = 1'-0"



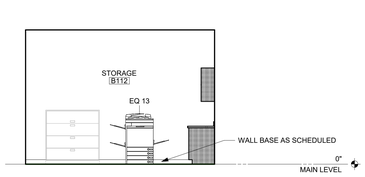
J24 INTERIOR ELEVATION - WOMEN'S LOCKER B166 - WEST
1/4" = 1'-0"



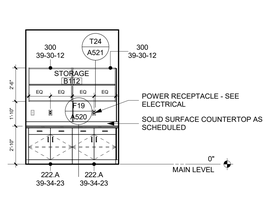
E1 INTERIOR ELEVATION - ADMINISTRATION B111 - SOUTH
1/4" = 1'-0"



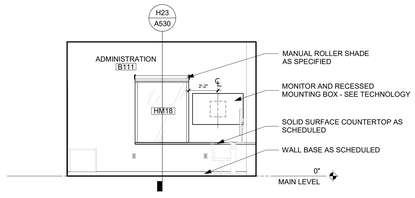
E7 INTERIOR ELEVATION - ADMINISTRATION B111 - WEST
1/4" = 1'-0"



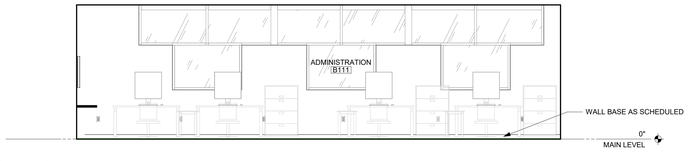
E17 INTERIOR ELEVATION - STORAGE B112 - SOUTH
1/4" = 1'-0"



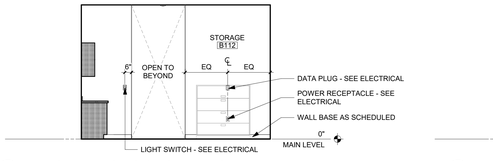
E22 INTERIOR ELEVATION - STORAGE B112 - WEST
1/4" = 1'-0"



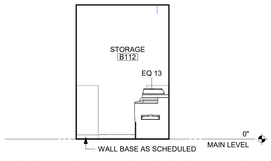
A1 INTERIOR ELEVATION - ADMINISTRATION B111 - NORTH
1/4" = 1'-0"



A7 INTERIOR ELEVATION - ADMINISTRATION B111 - EAST
1/4" = 1'-0"



A17 INTERIOR ELEVATION - STORAGE B112 - NORTH
1/4" = 1'-0"



A22 INTERIOR ELEVATION - STORAGE B112 - EAST
1/4" = 1'-0"

GLAZING TYPES

G1	1" DOUBLE PANE INSULATED GLAZING UNIT, DOUBLE LOW-E COATED, ARGON FILLED, BIRD FRIENDLY FRIT - SEE SPECIFICATION
G2	1" DOUBLE PANE INSULATED GLAZING UNIT, DOUBLE LOW-E COATED, ARGON FILLED - SEE SPECIFICATION
G3	1/4" TEMPERED VISION GLAZING - SEE SPECIFICATION
G4	1/2" RADIATION RESISTANT GLAZING - SEE SPECIFICATION
G5	BALLISTIC RESISTANT GLAZING - EXISTING RELOCATED IN LOBBY
P1	1" INSULATED METAL PANEL

KEYNOTE LEGEND

02 ADD	03 31.G4	12" CONCRETE CURB - LOCKERS - SEE CURB DETAILS ON A051
	06 61.B2	SOLID SURFACE COUNTERTOP AS SCHEDULED
	09 70.A1	WALL BASE AS SCHEDULED
	10 51.A1	LOCKERS TYP., CFCI
	10 51.B1	BUILT-IN BENCH
	10 51.B2	BUILT-IN ADA BENCH
	10 56.A2	SHELVING UNITS, OFOI
	22 42.A2	WALL-MOUNTED TOILET - SEE PLUMBING
	22 42.C3	UTILITY SINK & FAUCET - SEE PLUMBING
	23 00.B1	THERMOSTAT - SEE MECHANICAL
	26 05.A1	POWER RECEPTACLE - SEE ELECTRICAL
	26 05.A2	POWER RECEPTACLE - SEE ELECTRICAL
	26 05.A3	LIGHT SWITCH - SEE ELECTRICAL
	26 05.A5	DATA PLUG - SEE ELECTRICAL
	26 51.A1	LIGHT FIXTURE - SEE ELECTRICAL
	27 40.A1	MONITOR AND RECESSED MOUNTING BOX - SEE TECHNOLOGY
	27 40.B2	WALL MOUNTED CLOCK - SEE A/V DRAWINGS
	28 31.B1	FIRE ALARM HORN / STROBE - SEE ELECTRICAL

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Key Plan

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SOI Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

Sheet Name
INTERIOR ELEVATIONS

Sheet Number
A503

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A1 EQUIPMENT PLAN - MAIN LEVEL
1/8" = 1'-0"

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Revision	Description	Date
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OPN Project No. **23825001**
SOI Project No. **9429.00**

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
EQUIPMENT PLAN - MAIN LEVEL

Sheet Number
A701

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KEYNOTES

1. REMOVE EXISTING VAV UNIT, CONTROLS, PIPING, VALVES, SUPPORTS, AND ALL ASSOCIATED APPURTENANCES. REMOVE ASSOCIATED DUCTWORK AS SHOWN.
2. REMOVE EXISTING DIFFUSER/GRILLE, FLEX DUCT, SUPPORTS, AND ASSOCIATED APPURTENANCES.
3. REMOVE EXISTING CABINET UNIT HEATER, CONTROLS, PIPING, VALVES, SUPPORTS, AND ALL ASSOCIATED APPURTENANCES.

GENERAL NOTES:

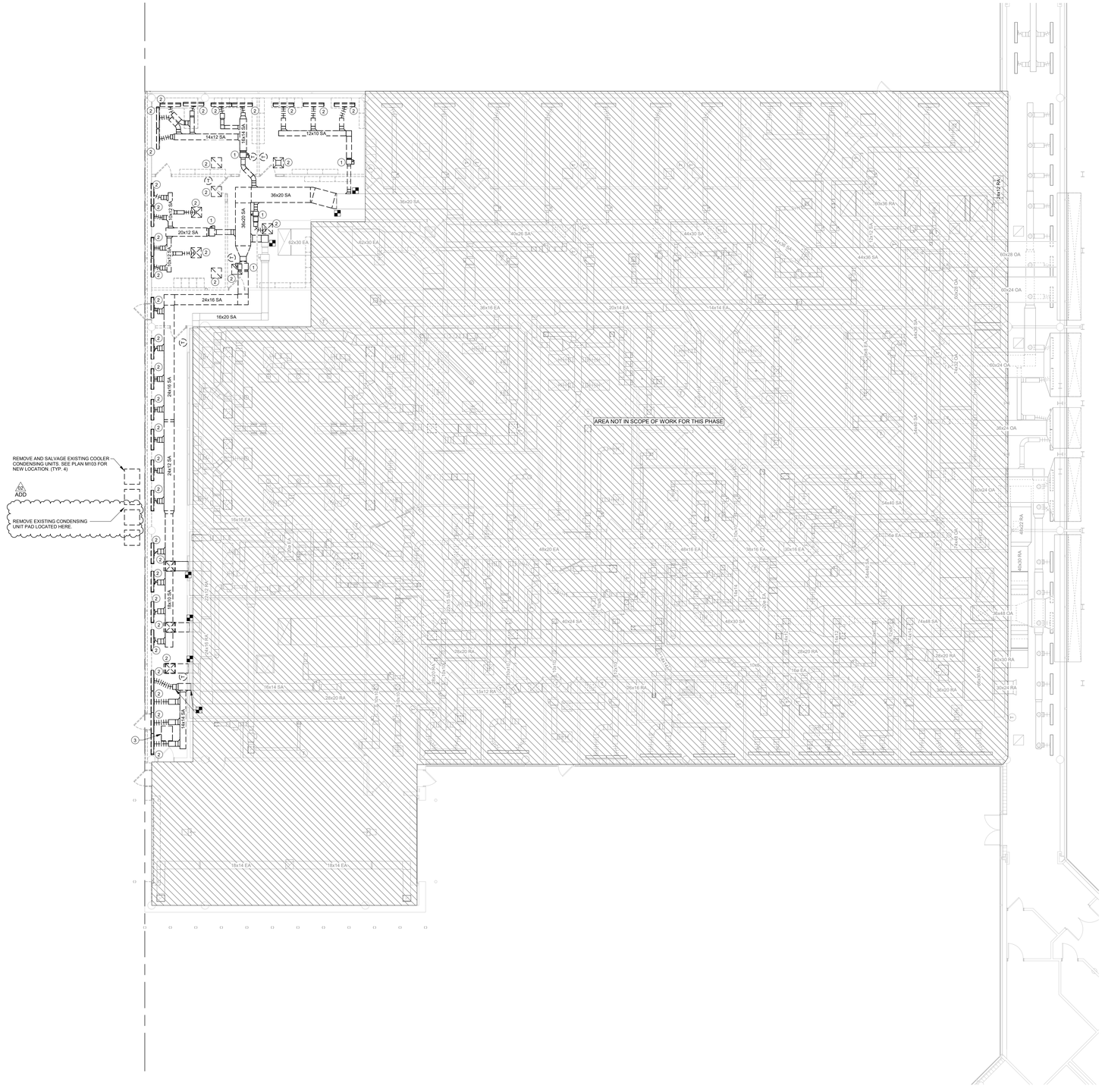
A. REFER TO M000 FOR GENERAL NOTES & SYMBOLS.

B. PATCH WALLS, ROOFS, AND/OR FLOOR WHERE DUCTS, GRILLES, PIPES, OR EQUIPMENT ARE REMOVED. PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION.

C. WHERE DUCTWORK IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS.

D. WHERE EQUIPMENT IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS, DUCTWORK, PIPING, AND CONTROLS.

E. WHERE CONTROLS ARE REMOVED, REMOVE ALL ASSOCIATED WIRING AND/OR PNEUMATIC TUBING. PATCH WALL OPENINGS AND PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION. IN WALLS THAT CANNOT BE PATCHED, INSTALL STAINLESS STEEL COVER PLATE. ABANDON PNEUMATIC TUBING IN WALLS.



1 MECHANICAL DEMOLITION - MAIN LEVEL - ADDITION
1/8" = 1'-0"

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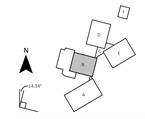

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SOI Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
MECHANICAL DEMOLITION - MAIN LEVEL - ADDITION

Sheet Number
MD101

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KEYNOTES (#)

1 REMOVE HWS/HWR CONNECTION AS SHOWN AND CAP AT MAIN.
2 REMOVE EXISTING UNIT HEATER, CONTROLS, PIPING, VALVES, SUPPORTS, AND ALL ASSOCIATED APPURTENANCES.
3 REMOVE EXISTING CABINET UNIT HEATER, CONTROLS, PIPING, VALVES, SUPPORTS, AND ALL ASSOCIATED APPURTENANCES.

GENERAL NOTES:

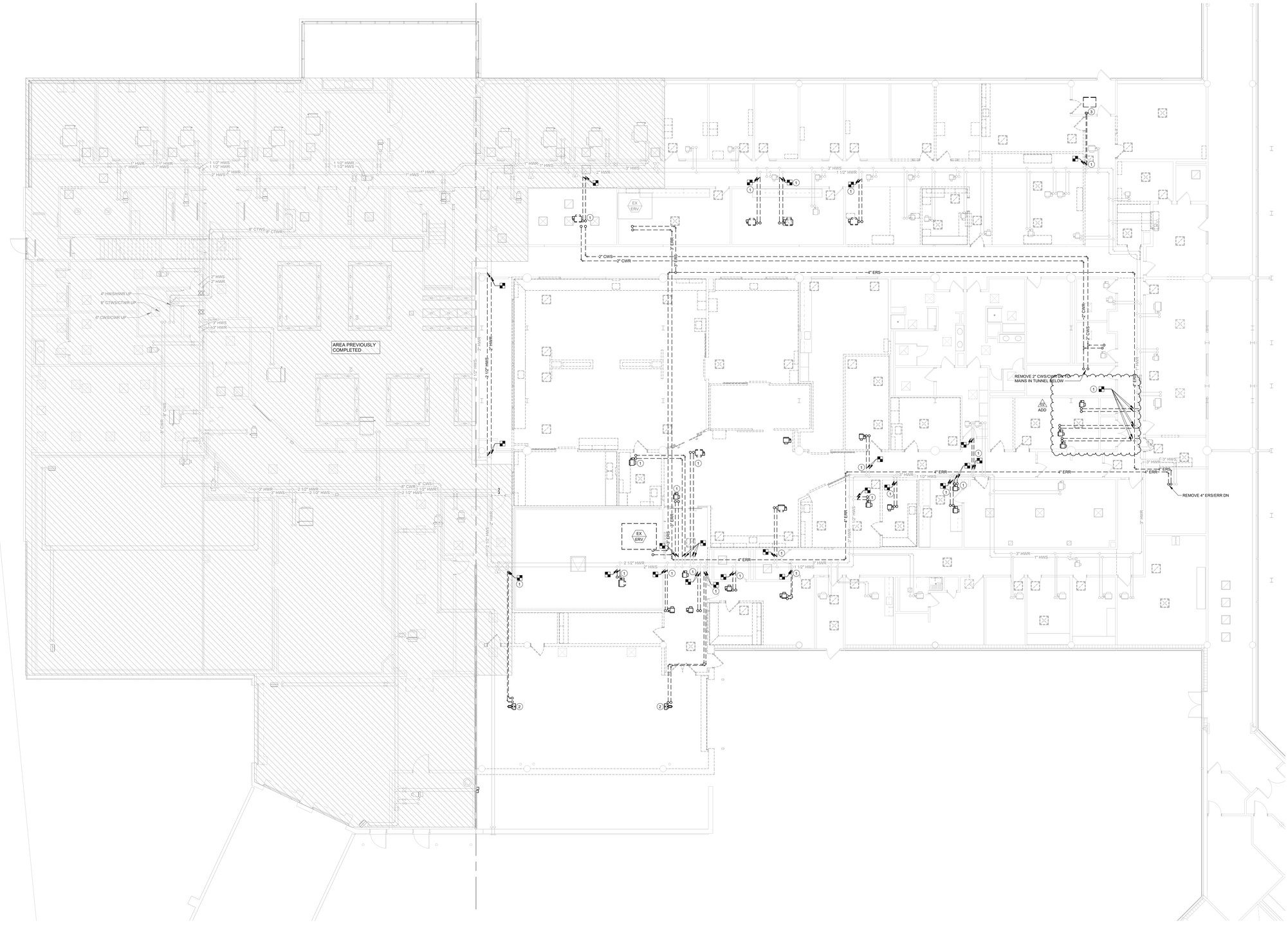
A. REFER TO M000 FOR GENERAL NOTES & SYMBOLS.

B. PATCH WALLS, ROOFS, AND/OR FLOOR WHERE DUCTS, GRILLES, PIPES, OR EQUIPMENT ARE REMOVED. PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION.

C. WHERE DUCTWORK IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS.

D. WHERE EQUIPMENT IS REMOVED, REMOVE ALL ASSOCIATED SUPPORTS, DUCTWORK, PIPING, AND CONTROLS.

E. WHERE CONTROLS ARE REMOVED, REMOVE ALL ASSOCIATED WIRING AND/OR PNEUMATIC TUBING. PATCH WALL OPENINGS AND PAINT OR FINISH TO MATCH ORIGINAL CONSTRUCTION. IN WALLS THAT CANNOT BE PATCHED, INSTALL STAINLESS STEEL COVER PLATE. ABANDON PNEUMATIC TUBING IN WALLS.



1 MECHANICAL PIPING DEMO - MAIN FLOOR LEVEL AREA-B - RENOVATION
1/8" = 1'-0"

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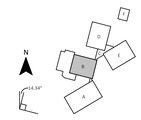

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SOI Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
MECHANICAL PIPING DEMOLITION - RENOVATION

MD104

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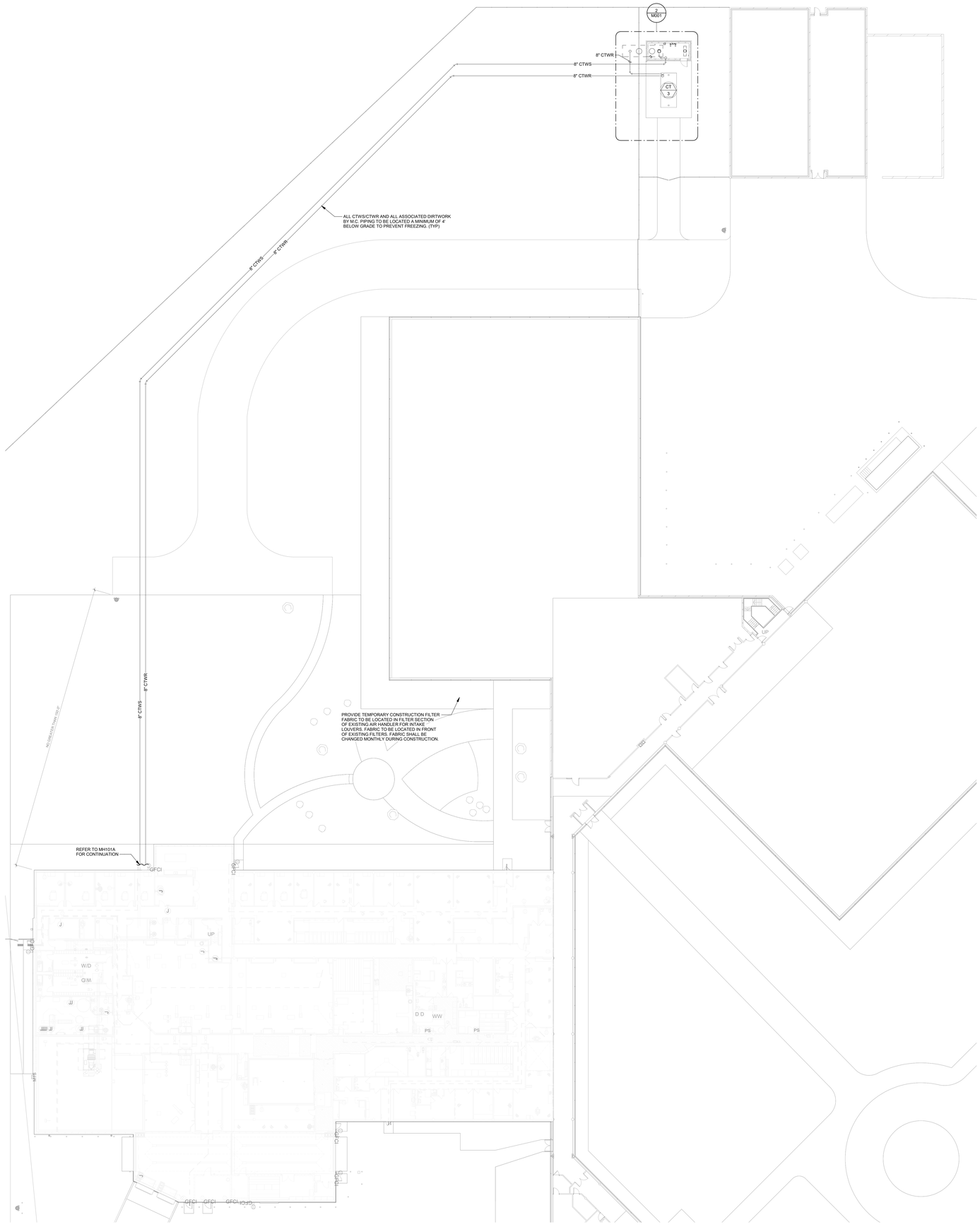


1 MECH SITE PLAN
1" = 20'-0"

GENERAL NOTES:

A. REFER TO M000 FOR GENERAL NOTES & SYMBOLS.

B. REFER TO M300, M301, M302, M303 AND M304 FOR MECHANICAL DETAILS.

C. REFER TO M400 AND M401 FOR CONTROLS SEQUENCES AND DIAGRAMS.

D. REFER TO M500, M501 AND M502 FOR MECHANICAL SCHEDULES.

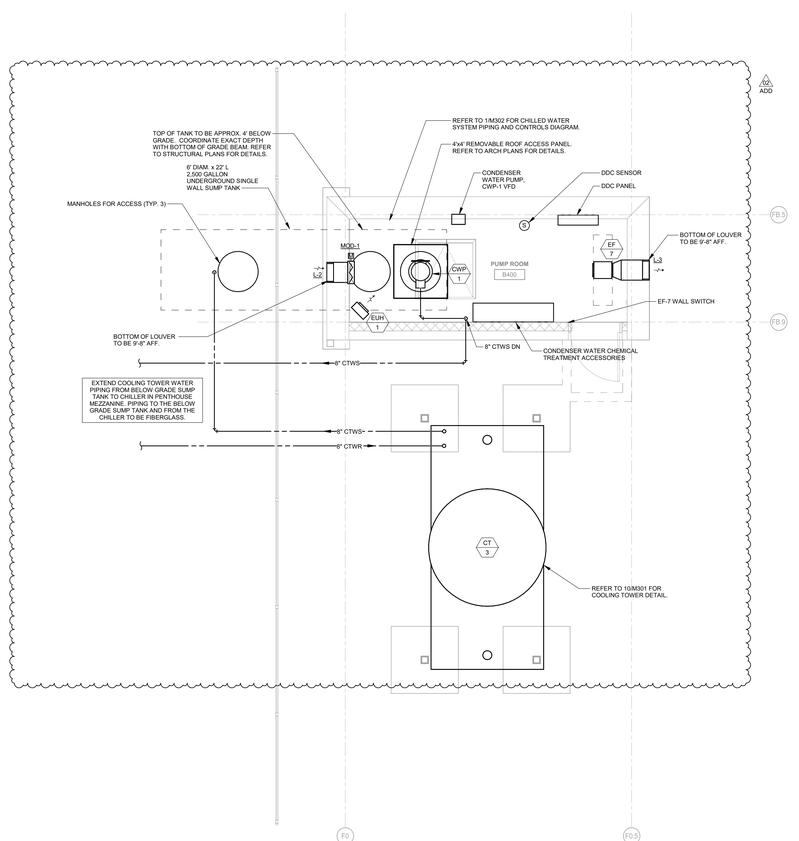
E. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE OF GRILLE, REGISTER, OR DIFFUSER UNLESS NOTED OTHERWISE.

F. MAXIMUM FLEXIBLE DUCT LENGTH TO DIFFUSERS SHALL BE 60", WITH MAXIMUM OF ONE 90 DEGREE ELBOW.

G. BRANCH DUCT SIZES TO TERMINAL AIR BOXES SHALL MATCH INLET SIZE FOR FOUR STRAIGHT DUCT DIAMETERS CONNECTED TO THE INLET OF THE TERMINAL AIR BOXES. NO FLEX DUCTWORK WILL BE ALLOWED BETWEEN DUCT MAIN AND TERMINAL AIR BOX.

H. ROUTE AND SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

I. ALL DUCTWORK PENETRATIONS TO BE SEALED AIR TIGHT. REFER TO A003 FOR SPECIFIC WALL REQUIREMENTS.



2 ENLARGED PLAN -COOLING TOWER / GENERATOR / PUMP HOUSE
1/4" = 1'-0"

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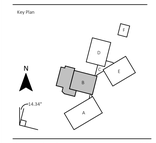

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SOI Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
MECH SITE PLAN

Sheet Number
M001

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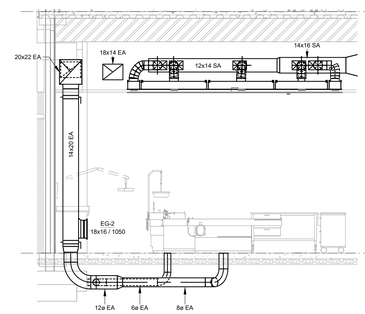
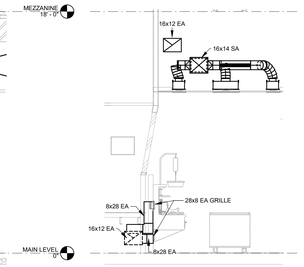
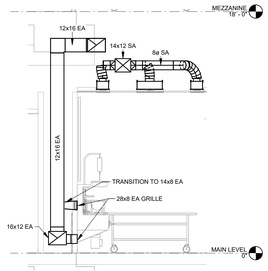


2 DOWNDRAFT AUTOPSY TABLE DUCT SECTION
1/4" = 1'-0"



3 OBSERVATORY/AUTOPSY DUCT SECTION
1/4" = 1'-0"



4 OBSERVATORY/AUTOPSY DUCT RISER SECTION
1/4" = 1'-0"

KEYNOTES

#	
1	MAXIMUM DRYER DUCT LENGTH, INCLUDING EQUIVALENT LENGTH OF ELBOWS, SHALL NOT EXCEED 35 FEET IN ACCORDANCE WITH CODE. ANY DEVIATIONS OR ALTERATIONS TO THIS ROUTING SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
2	PROVIDE FIELD FABRICATED HOOD BY M.C. HOOD DIMENSIONS SHALL BE 3' x 7' x 5' AND SHALL BE BUILT TO SMACNA DUCT STANDARDS WITH WELDED SEAMS. TOP OF HOOD SHALL SLOPE FROM 1" H AT CORNERS TO 1.5' H AT THE CENTER TO 6" DIA. CONNECTION. HOOD MATERIAL SHALL BE 304 STAINLESS STEEL. BOTTOM OF HOOD TO BE 7'0" A.F.F..
3	SIEMENS MONITOR TO PROVIDE AND TEMPERATURE, AIR CHANGES AND ROOM PRESSURE INFORMATION.
4	DASHED LINE INDICATES ACCESS PANEL. REFER TO ARCHITECTURAL DRAWINGS FOR SIZE, TYPE, AND INSTALLATION REQUIREMENTS.
5	PROVIDE CABLE OPERATED DAMPER WITH WALL BOX ABOVE CEILING ACCESSIBLE FROM CORRIDOR CEILING. LOCATE DAMPER DOWNSTREAM OF EG-2. ROUND DAMPER WITH WORM GEAR REGULATOR TO BE YOUNG REGULATOR 5020-1200 OR EQUAL. WALL BOX TO BE DUROZONE CONCEALED WALL BOX FOR CABLE OPERATED DAMPER OR EQUAL.
6	PROVIDE CABLE OPERATED DAMPER WITH WALL BOX ABOVE ACCESSIBLE CEILING TILES IN AUTOPSY ROOM. LOCATE DAMPER DOWNSTREAM AND UPSTREAM OF EG-2. ROUND DAMPER WITH WORM GEAR REGULATOR TO BE YOUNG REGULATOR 5020-1200 OR EQUAL. WALL BOX TO BE DUROZONE CONCEALED WALL BOX FOR CABLE OPERATED DAMPER OR EQUAL.
7	10" SA/10"EA TO/FROM DEHUMIDIFIER PROVIDED WITH COOLERS. COORDINATE FINAL LOCATION AND SIZE PRIOR TO INSTALLATION.
8	UNDERGROUND DUCTWORK SHALL BE HDPE. REFER TO DETAIL 18/M300 AND DUCTWORK INSULATION SCHEDULE FOR DETAILS.
9	EXTEND 6" DUCT UP 5" A.F.F. PROVIDE 3' LONG FLEXIBLE DUCT HOSE WITH COLLARS TO EXTEND FROM HARD DUCT CONNECTION TO TABLE VENTILATION BASIN COLLAR. PROVIDE MANUAL BALANCING DAMPER IN HARD DUCT PORTION. (FLEXIBLE DUCT HOSE TO BE PVC LAMINATE POLYESTER RATED FOR UP TO 180F AND CHEMICAL FUMES.)
10	EXTEND 8" DUCT UP 6" A.F.F. AND PROVIDE A 1/2" X 1/2" MESH OVER OPEN DUCT END. PROVIDE MANUAL BALANCING DAMPER IN HARD DUCT PORTION.
11	EXTEND (2) 28"X8" AND 22"X8" EXHAUST FROM BACK OF TABLE TO MAIN DUCT AND EXTEND (2) 28"X0" EXHAUST FROM BELOW TABLE TO EA DUCT MAIN. BALANCE EACH GRILLE TO 200 CFM.

GENERAL NOTES:

A. REFER TO M000 FOR GENERAL NOTES & SYMBOLS.

B. REFER TO M300, M301, M302, M303 AND M304 FOR MECHANICAL DETAILS.

C. REFER TO M400 AND M401 FOR CONTROLS SEQUENCES AND DIAGRAMS.

D. REFER TO M500, M501 AND M502 FOR MECHANICAL SCHEDULES.

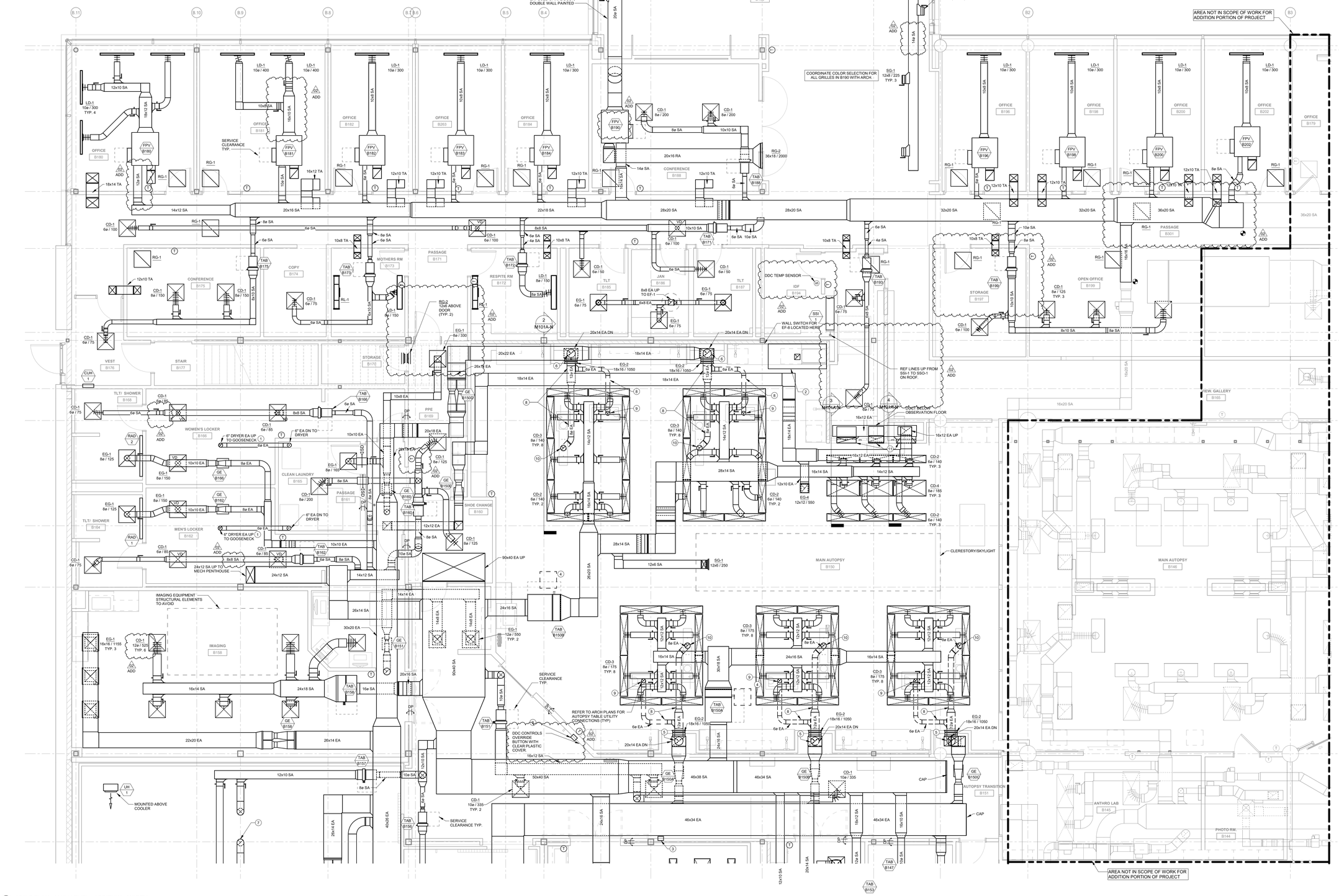
E. BRANCH DUCT SIZES TO AIR TERMINALS SHALL MATCH NECK SIZE OF GRILLE, REGISTER, OR DIFFUSER UNLESS NOTED OTHERWISE.

F. MAXIMUM FLEXIBLE DUCT LENGTH TO DIFFUSERS SHALL BE 60", WITH MAXIMUM OF ONE 90 DEGREE ELBOW.

G. BRANCH DUCT SIZES TO TERMINAL AIR BOXES SHALL MATCH INLET SIZE FOR FOUR STRAIGHT DUCT DIAMETERS CONNECTED TO THE INLET OF THE TERMINAL AIR BOXES. NO FLEX DUCTWORK WILL BE ALLOWED BETWEEN DUCT MAIN AND TERMINAL AIR BOX.

H. ROUTE AND SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

I. ALL DUCTWORK PENETRATIONS TO BE SEALED AIR TIGHT. REFER TO A003 FOR SPECIFIC WALL REQUIREMENTS.


DUCTWORK TO BE LOCATED TIGHT TO STRUCTURE ABOVE CEILING BAFFLES.
EXPOSED SPIRAL DUCT, DOUBLE WALL PAINTED
POINT SG-1 DOWN 30 DEGREES FROM VERTICAL (TYP. 9)
AREA NOT IN SCOPE OF WORK FOR ADDITION PORTION OF PROJECT
COORDINATE COLOR SELECTION FOR ALL GRILLES IN B190 WITH ARCH.
SERVICE CLEARANCE TYP.
IMAGING EQUIPMENT STRUCTURAL ELEMENTS TO AVOID
MOUNTED ABOVE COOLER
DDC CONTROLS OVERRIDE BUTTON WITH CLEAR PLASTIC COVER.
REFER TO ARCH PLANS FOR AUTOPSY TABLE UTILITY CONNECTIONS (TYP)
WALL SWITCH FOR EF-8 LOCATED HERE
REF LINES UP FROM SSI-1 TO SSO-1 ON ROOF.
CLERESTORY/SKYLIGHT
AUTOPSY TRANSITION
CAP
OBSERVATION FLOOR
MAIN AUTOPSY B150
ANTHRO LAB B145
PHOTO RM. B144
VIEW. GALLERY B165
OPEN OFFICE B199
PASSAGE B301
OFFICE B179
OFFICE B180
OFFICE B181
OFFICE B182
OFFICE B263
OFFICE B184
OFFICE B196
OFFICE B198
OFFICE B200
OFFICE B209
CONFERENCE B188
PASSAGE B171
MOTHERS RM B173
COPY B174
CONFERENCE B175
RESPITE RM B172
JAN B186
TLT B185
TLT B187
IDF B194
STORAGE B197
VEST B176
STAIR B177
STORAGE B170
TLT/ SHOWER B168
WOMEN'S LOCKER B166
PPE B169
CLEAN LAUNDRY B165
PASSAGE B161
SHOE CHANGE B160
TLT/ SHOWER B164
MEN'S LOCKER B162
IMAGING B158
24x12 SA UP TO MECH PENTHOUSE
90x40 EA UP
6" DRYER EA UP TO GOOSENECK
6" DRYER EA UP TO GOOSENECK
6" EA DN TO DRYER
6" EA DN TO DRYER
6" DRYER EA UP TO GOOSENECK
SG-1 12x8 / 225 TYP. 5
SG-1 12x8 / 225
SG-1 12x8 / 225 TYP. 3
SG-1 12x6 / 250
RG-2 36x18 / 2000
EG-1 12a / 550 TYP. 2
EG-2 18x16 / 1050
EG-4 12x12 / 550
CD-1 10a / 335
CD-1 10a / 335 TYP. 2
CD-1 8a / 125 TYP. 3
CD-2 6a / 140 TYP. 3
CD-3 8a / 140 TYP. 8
CD-4 6a / 185 TYP. 3
CD-3 8a / 175 TYP. 8
EG-1 16x16 / 1155 TYP. 3
CD-1 12a / 525 TYP. 6
EG-1 8a / 330
EG-1 6a / 75
CD-1 6a / 75
CD-1 8a / 150
CD-1 8a / 200
CD-1 10a / 400
CD-1 10a / 300
LD-1 10a / 300 TYP. 4
LD-1 8a / 150
LD-1 10a / 400
LD-1 10a / 300
RG-1
RL-1
FPV B180
FPV B181
FPV B182
FPV B183
FPV B184
FPV B190
FPV B196
FPV B198
FPV B200
FPV B202
TAB B175
TAB B173
TAB B172
TAB B171
TAB B188
TAB B195
TAB B199
TAB B166
TAB B160
TAB B162
TAB B157
TAB B158
TAB B156
TAB B150A
TAB B151
TAB B147
TAB B153
GE B166
GE B162
GE B160
GE B157
GE B156
GE B150A
GE B150B
GE B150C
VD
CUH 1
UH 1
RAD 1
RAD 2
EF-8
SSI
SSO-1
M101A-N
ADD 02
ADD
14x8 SA
14x14 SA
20x16 RA
14x12 SA
28x20 SA
22x18 SA
32x20 SA
36x20 SA
10x8 SA
10x10 SA
8x8 SA
6x8 SA
6x6 SA
4x8 SA
4x4 SA
10x8 TA
12x10 TA
16x12 TA
18x14 TA
8x8 EA
6x8 EA
20x14 EA DN
20x18 EA
20x22 EA
18x14 EA
16x12 EA
16x14 SA
28x14 SA
26x14 EA
26x20 SA
24x16 SA
30x20 EA
22x20 EA
46x38 SA
46x34 SA
46x34 EA
40x20 EA
90x40 SA
90x40 EA
16x20 SA
24x18 SA
16a SA
10a SA
8a SA
6a SA
4a SA
12x10 EA
10x10 EA
8a EA
6a EA
4a EA
10x8 EA
8x8 EA
6x8 EA
20x14 EA
20x18 EA
20x22 EA
18x14 EA
16x12 EA
16x14 SA
28x14 SA
26x14 E

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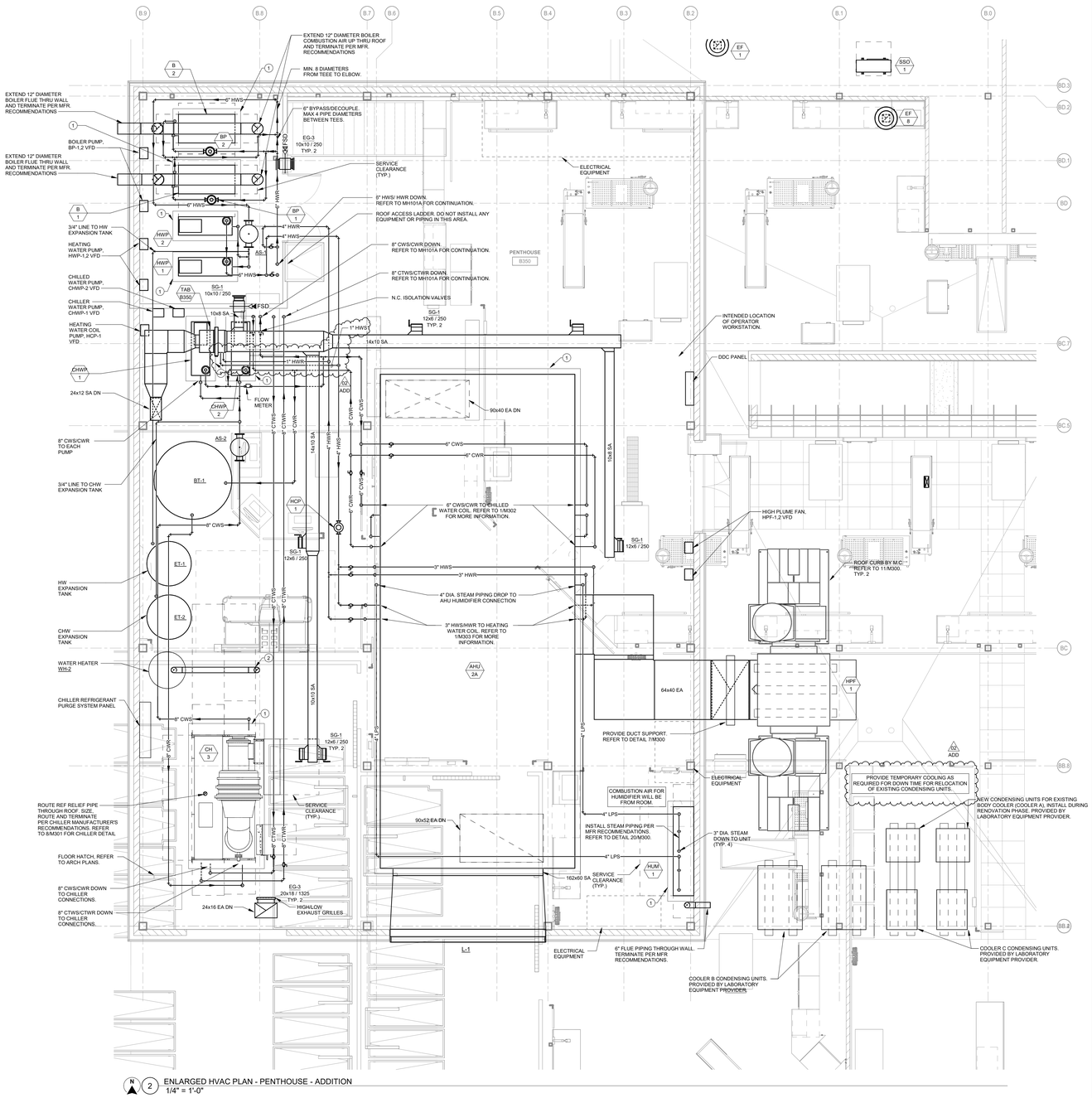
I. ALL DUCTWORK PENETRATIONS TO BE SEALED AIR TIGHT. REFER TO A003 FOR SPECIFIC WALL REQUIREMENTS.

KEYNOTES

1 HOUSEKEEPING PAD TYPICAL, EXTEND 6" PAST EQUIPMENT ON ALL SIDES.

2 WATER HEATER FLUE/INTAKE CONCENTRIC VENT UP THROUGH ROOF. SIZE AND ROUTE PER MANUFACTURERS RECOMMENDATIONS.



N 2 ENLARGED HVAC PLAN - PENTHOUSE - ADDITION
1/4" = 1'-0"

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Key Plan

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SOI Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
HVAC PLAN - PENTHOUSE PLAN

Sheet Number
M102

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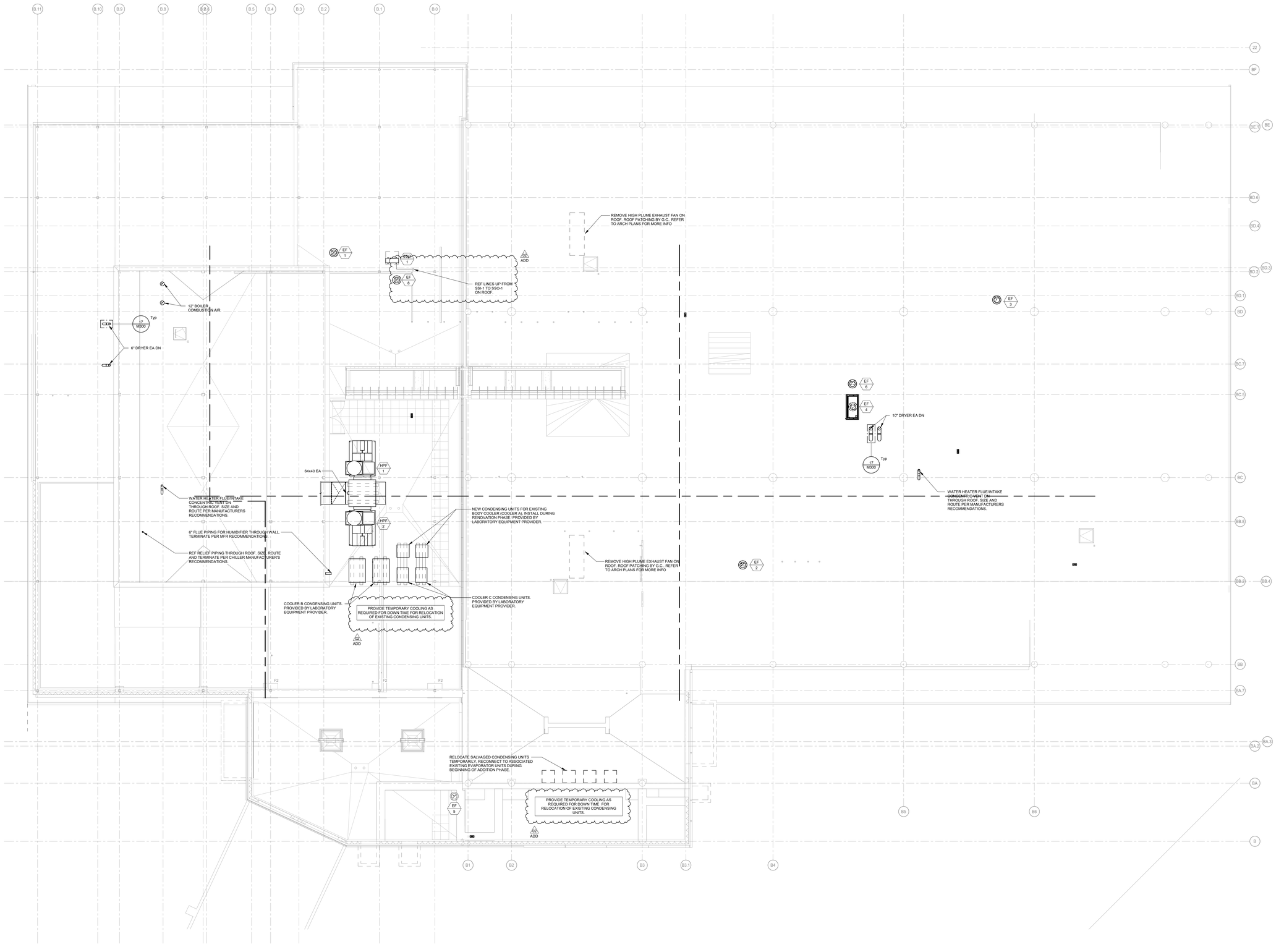

N 1 HVAC PLAN - ROOF PLAN
1/8" = 1'-0"

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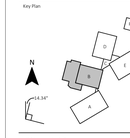
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. **23825001**
SOI Project No. **9429.00**

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

Sheet Name
HVAC PLAN - ROOF PLAN

Sheet Number
M103

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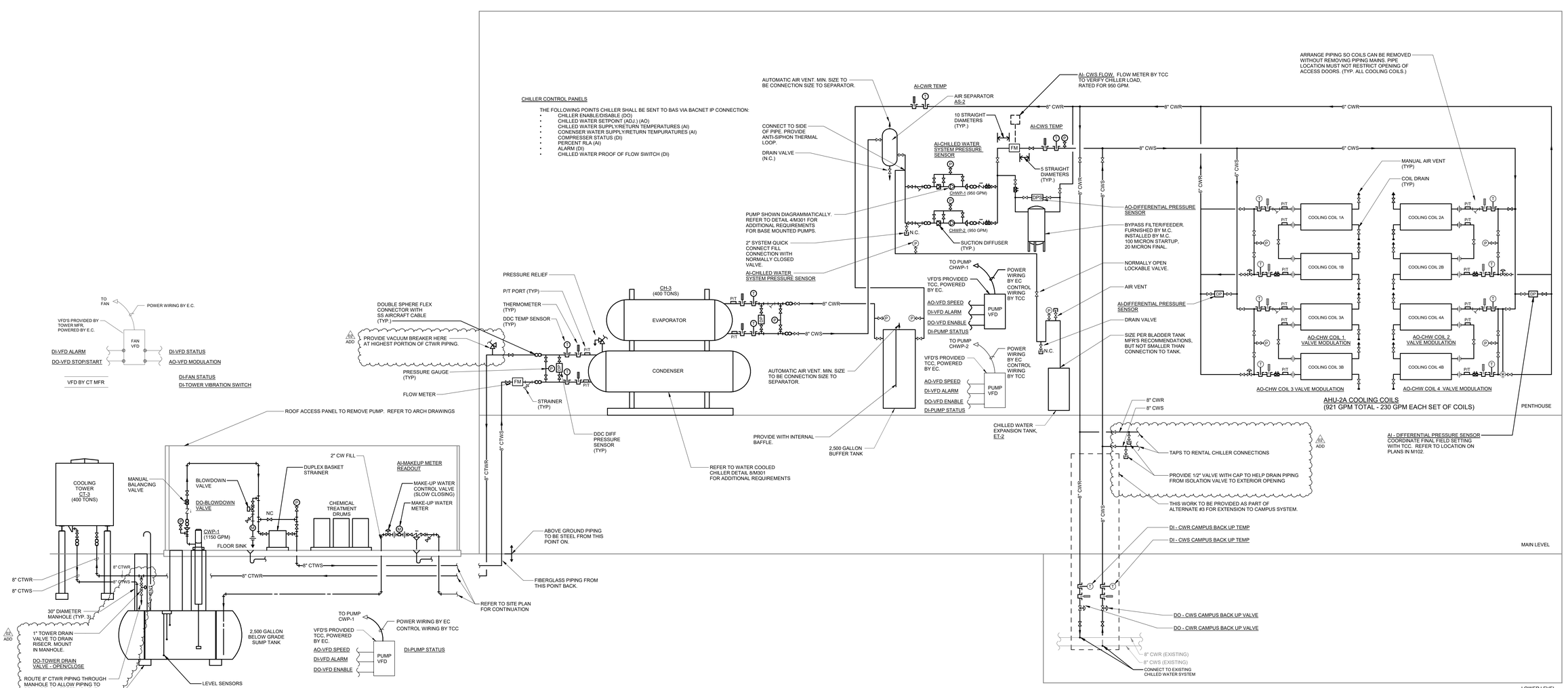


1 CHILLED WATER SYSTEM PIPING AND CONTROLS DIAGRAM

COOLING SYSTEM SEQUENCE OF OPERATION:

GENERAL

- THE COOLING SYSTEM IS CONTROLED BY A DDC CONTROLLER VIA THE BUILDING AUTOMATION SYSTEM (BMS). CHILLED WATER PLANT CONSISTS OF ONE 400 TON WATER COOLED CHILLER MATCHED WITH AN OPEN COOLING TOWER, BELOW GRADE SUMP AND ASSOCIATED PUMPS.
- CHILLED WATER DISTRIBUTION IS ACCOMPLISHED WITH A PRIMARY PUMPING ARRANGEMENT.
- CONDENSER WATER FOR CH-3 IS DISTRIBUTED WITH A CONSTANT SPEED PUMP.
- A FACTORY MOUNTED CHILLER CONTROL PANEL SHALL BE PROVIDED FOR NEW CHILLER BY THE CHILLER MFR.
- WHENEVER THE CHILLER IS ENABLED, THE CHILLED WATER SUPPLY TEMPERATURE SHALL BE AT 36 DEG F.

CHILLER CONTROL SEQUENCE (WATER COOLED CHILLERS):

WHEN THE BAS ENABLES CHILLER (CH-3) TO START THE FOLLOWING SHALL OCCUR:

- CONDENSER WATER SUMP LEVEL SHALL BE PROVEN. NO LEVEL ALARMS SHALL BE ANNUNCIATED.
- COOLING TOWER DRAIN VALVE SHALL BE CLOSED.
- CHILLED WATER PUMP SHALL BE ENERGIZED.
- CONDENSER WATER PUMP SHALL BE ENERGIZED.
- COOLING TOWER FAN SHALL BE ENERGIZED.

ONCE CHILLER SAFETIES ARE SATISFIED, THE BAS SHALL ENERGIZE THE CHILLER SHALL MAINTAIN CHILLED WATER SETPOINT VIA INTERNAL CONTROLS.

THE BAS SHALL ENABLE CHILLER TO RUN 24/7.
EACH TIME THE CHILLER IS ENABLED TO RUN OR THE CHILLER IS DISABLED, THE BAS SHALL DISPLAY ON SCREEN AND SHALL PRINT THE CRITERIA WHICH CAUSED THE ACTION TO OCCUR.

COOLING SYSTEM SEQUENCE OF OPERATION (CONTINUED):

THE BAS SHALL CONTINOUSLY CALCULATE AND DISPLAY, ON THE GRAPHIC SCREEN OF THE OPERATOR WORK STATION, THE FOLLOWING INFORMATION:

- CH-3 CWS AND CWR TEMPERATURE (FROM CHILLER PANEL).
- LOOP CWS AND CWR TEMPERATURES AND FLOW RATES
- LOOP TOTAL TONNAGE (SUMMED FROM CHILLER PANEL)

CHILLER SYSTEM SHUTDOWN:

THE FOLLOWING SHALL OCCUR IN ORDER:

- CHILLER CONTROL PANEL SHALL BE DISABLED.
- CONDENSER PUMP CWP-1 SHALL STOP.
- AFTER 5 MIN (ADJ.) THE CHILLED WATER PUMPS CHWP-1 / CHWP-2 SHALL STOP.
- COOLING TOWER DRAIN VALVE SHALL BE OPENED.

CHILLED WATER PUMP CONTROL (CHWP-1, CHWP-2):

CHWP-1 & CHWP-2 SHALL BE SET UP TO OPERATE IN LEAD LAG OPERATION WHEN CH-3 IS OPERATING. ONLY ONE PUMP SHALL OPERATE AT A TIME UNLESS THE DIFFERENTIAL PRESSURE SENSOR(S) CONTROLLING THE PUMPS ARE NOT SATISFIED AS DESCRIBED BELOW:

START/STOP: THE BAS SHALL START THE LEAD PUMP VIA THE VFD WHENEVER THE CHILLER CONTROL PANEL IS ENABLED. THE LAG PUMP SHALL BE OFF. CURRENT STATUS SWITCH: LOCATE SWITCHES SO THEY SENSE PUMP STATUS WHEN OPERATED BY THE VFD.

SPEED CONTROL: PUMPS SHALL BE CONTROLLED BY A DIFFERENTIAL PRESSURE SENSOR. THE OUTPUT SIGNAL FROM THE DIFFERENTIAL PRESSURE SENSOR SHALL BE A DIRECT INPUT TO THE VFD PUMP CONTROLLERS. THE CONTROL SIGNAL SHALL NOT BE TRANSMITTED ACROSS THE BAS TO THE VFD PUMP CONTROLLER. INITIAL SETPOINT SHALL BE 20 PSI (ADJ.) FINAL SETPOINT SHALL BE OPTIMIZED BY THE BALANCING CONTRACTOR. THE PUMPS SHALL HAVE A MINIMUM SPEED AS DETERMINED BY THE BALANCING CONTRACTOR AS PART OF THE SYSTEM START-UP. CHILLER MIN. FLOWS FOR REFERENCE ARE AS FOLLOWS: CH3 - 235 GPM.

PUMP STAGING: IF THE OPERATING PUMP CANNOT MAINTAIN THE DIFFERENTIAL PRESSURE SETPOINT FOR 10 MIN. (ADJ.), THE OPERATING PUMP SPEED SHALL BE REDUCED TO 65% (ADJ.) AND THEN THE LAG PUMP SHALL START. ONCE ALL OPERATING PUMP(S) ARE AT 65% (ADJ.) SPEED, THE PUMPS SHALL MODULATE IN UNISON TO MAINTAIN THE DIFFERENTIAL PRESSURE SETPOINT.

WHEN THE OPERATING PUMP(S) SPEED IS BELOW 65% (ADJ.) FOR 15 MIN. (ADJ.) TURN OFF THE LAG PUMP.

COOLING TOWER CONTROL:

FAN OPERATION

- START/STOP: WHEN A CHILLER IS ENABLED VIA THE BAS, THE COOLING TOWER FAN SHALL START VIA THE VFD.
- CURRENT STATUS SWITCH: LOCATE SWITCH SO IT CAN SENSE FAN STATUS WHEN OPERATED BY THE VFD.
- SPEED CONTROL: THE PURPOSE OF THE COOLING TOWER FAN CONTROL IS TO MAINTAIN THE CONDENSER WATER SUPPLY TEMPERATURE SETPOINT. THE DDC SYSTEM SHALL CONTROL THE COOLING TOWER FAN VFD USING A 4-20 MA OUTPUT. THE TOWER FANS SHALL HAVE A MINIMUM SPEED AS DETERMINED BY THE BALANCING CONTRACTOR AS PART OF THE SYSTEM STARTUP.
- CONDENSER WATER TEMPERATURE CONTROL: WITH CHILLER IN OPERATION, THE VFD SERVING THE COOLING TOWER FAN SHALL MODULATE FAN RPM AS REQUIRED TO MAINTAIN CONDENSER WATER SUPPLY TEMPERATURE OF 70 DEG (F) (ADJ.). THE SAME CONTROL SIGNAL SHALL BE USED TO MODULATE THE ENERGIZED COOLING TOWER FANS IN UNISON. VERIFY ACCEPTABLE CONDENSER WATER TEMPERATURES WITH THE INSTALLED CHILLER MANUFACTURER.

VIBRATION SWITCH: INSTALL A VIBRATION SWITCH TO STOP OPERATION OF THE COOLING TOWER FAN IF THE SWITCH IS ACTIVATED.

MAKE-UP WATER METER: THE BAS SHALL BE CONNECTED TO THE WATER METER TO PROVIDE WATER CONSUMPTION INFORMATION.

LEVEL CONTROL: ELECTRONIC WATER LEVEL SENSORS IN THE BELOW GRADE SUMP TANK SHALL CONTROL WATER MAKE-UP AND MONITOR WATER LEVEL ALARMS:

- WHEN THE WATER LEVEL IS BETWEEN THE "LOW" AND "HIGH" LEVELS, THE MAKE-UP WATER CONTROL VALVE SHALL BE CLOSED.
- WHEN THE WATER LEVEL DROPS TO "LOW" LEVEL, THE LEVEL SENSOR SHALL SEND A SIGNAL TO THE DDC SYSTEM TO OPEN THE MAKE-UP WATER CONTROL VALVE.
- WHEN THE WATER LEVEL RAISES TO "HIGH" LEVEL, THE LEVEL SENSOR SHALL SEND A SIGNAL TO THE DDC SYSTEM TO CLOSE THE MAKE-UP WATER CONTROL VALVE.
- IF THE WATER LEVEL DROPS TO THE LOW ALARM LEVEL OR THE WATER LEVEL RISES TO THE HIGH ALARM LEVEL, THE BAS SHALL SEND AN ALARM TO THE OPERATOR INTERFACE.

BLOWDOWN: THE T.C.C. SHALL UTILIZE NECESSARY RELAYS AND COMPONENTS AS REQUIRED TO CONNECT THE BAS SYSTEM TO THE BLOWDOWN WATER METER (BY CHEMICAL TREATMENT SUPPLIER) TO PROVIDE BLOWDOWN CONSUMPTION INFORMATION.

ALARMS, SAFETIES AND INTERLOCKS:

SEND AN ALARM TO THE OPERATOR INTERFACE UPON THE OCCURANCE OF THE FOLLOWING:

- IF ANY VFD INDICATES AN ALARM OR HAS NOT STARTED AFTER ONE CALL, AN ALARM SHALL BE SENT TO THE OPERATOR INTERFACE.
- IF A PUMP OR FAN CURRENT STATUS SWITCH DOES NOT PROVE FAN OPERATION.
- AN ALARM AT A CHILLER CONTROL PANEL.
- CONTACT CLOSURE INDICATING HIGH DIFFERENTIAL PRESSURE ACROSS BYPASS FILTER SYSTEM.
- IF CHILLER WATER SETPOINT IS MORE THAN 3 DEG F (ADJ.) ABOVE OR BELOW SETPOINT FOR MORE THAN 60 MIN (ADJ.)
- IF SYSTEM DIFFERENTIAL PRESSURE IS NOT MAINTAINED FOR MORE THE 15 MIN. (ADJ.)
- REFRIGERANT LEAK DETECTED.
- CHILLER WATER SYSTEM PRESSURE SENSOR DROPS BELOW NORMAL FILL PRESSURE.

COOLING SYSTEM REPORT GENERATION:

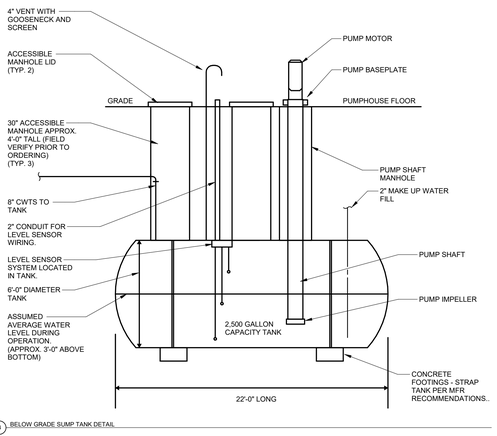
BAS SHALL MONITOR THE FOLLOWING POINT ON 5 MIN. (ADJ.) INTERVALS WITH SIGNAL TREND. THE TREND SHALL RUN FOR A 365 DAY (ADJ.) DURATION AT WHICH POINT THE NEWEST VALUES SHALL OVERWRITE THE OLDEST VALUES:

- DATE
- TIME
- GLOBAL OUTSIDE AIR TEMP. (F)
- FOR CH-3 CHILLED WATER SUPPLY TEMP (F)
- FOR CH-3 CHILLED WATER RETURN TEMP (F)
- SYSTEM CHILLED WATER SUPPLY TEMP (F)
- SYSTEM CHILLED WATER SUPPLY TEMP SETPOINT (F)
- SYSTEM CHILLED WATER RETURN TEMP (F)
- CONDENSER WATER SUPPLY TEMP (F)
- CONDENSER WATER RETURN TEMP (F)
- SYSTEM CHILLED WATER FLOW RATE (GPM)
- COOLING SYSTEM LOAD (TONS)
- OPERATIONAL STATUS OF CHILLER, CHILLED WATER PUMP AND CONDENSING WATER PUMP.

THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN NEITHER TABULAR OR GRAPHICAL FORM ON THE BAS.

ONCE PER MONTH THE BAS SHALL RECORED THE LARGEST COOLING SYSTEM LOAD (IN TONS) WHICH OCCURED DURING THAT MONTH. THE DATE, TIME, OUTSIDE AIR TEMPERATURE, SECONDARY CHILLED WATER SUPPLY AND RETURN TEMPERATURES WHICH COINCIDED WITH THAT EVENT SHALL ALSO BE RECORDED. THIS INFORMATION SHALL BE STORED TO A MEMORY LOCATION ON THE BAS OPERATOR INTERFACE THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN).

2 CHILLED WATER SYSTEM SEQUENCE OF OPERATION



3 BELOW GRADE SUMP TANK DETAIL

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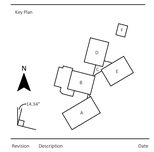
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. **23825001**
SOR Proj No. **9429.00**

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
MECHANICAL DETAILS

Sheet Number
M302

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TERMINAL AIR BOX SCHEDULE - AHU-2A (RENOVATION)

REFERENCE	TAB-B128	TAB-B132	TAB-B135	TAB-B137	TAB-B139	TAB-B141	TAB-B142	TAB-B143	TAB-B144	TAB-B145	TAB-B146	TAB-B150C	TAB-B150D	TAB-B154	TAB-B314
MANUFACTURER	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MODEL #	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV
TYPE	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW
SERVES	B128 - WAITING	B132 - PASSAGE	B135 - TISSUE PREP	B137 - VEST	B139 - LONG TERM STORAGE	B141 - TISSUE RECOVERY	B142 - DIRTY LAUNDRY	B143 - CART WASH	B144 - ANTHRO	B145 - INTAKE	B146 - EVIDENCE	B150 - MAIN AUTOPSY	B150 - MAIN AUTOPSY	B142 - BODY COOLER	AUTOPSY ST. / CRIME ST.
WEIGHT (LBS)	43	56	47	43	43	56	69	43	78	56	78	89	89	43	47
DIMENSIONS - L x W x D (INCHES)	15.5x12x8	15.5x14x13	15.5x12x10	15.5x12x8	15.5x12x8	15.5x14x13	15.5x16x15	15.5x12x8	15.5x20x18	15.5x14x13	15.5x20x18	15.5x24x18	15.5x24x18	15.5x12x8	15.5x12x10
BOX SIZE / INLET SIZE (INCHES)	6	10	7	5	6	10	12	6	14	10	14	16	16	6	7
OCC. MAX COOLING AIRFLOW (CFM)	350	1000	540	200	300	950	1600	400	2400	1000	2500	2800	3050	300	500
OCC. MAX HEATING AIRFLOW (CFM)	235	1000	360	135	200	950	1070	400	2400	1000	2500	2800	3050	300	335
MINIMUM AIRFLOW (CFM)	120	500	100	70	100	475	100	200	1200	500	1250	1400	1525	300	100
REHEAT COIL	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER
CAPACITY (MBH)	10.2	43.2	15.6	5.8	8.6	41.0	69.1	17.3	103.7	43.2	108.0	121.0	131.8	13.0	14.5
EAT (°F)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
LAT (°F)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
EWT (°F)	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130
LWT (°F)	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
FLOW RATE (GPM)	1.0	4.3	1.6	0.6	0.9	4.1	6.9	1.7	10.4	4.3	10.8	12.1	13.2	1.3	1.4
PRESSURE DROP (WPD) (FT. HD)	0.25	0.26	0.28	0.25	0.25	0.26	0.44	0.25	0.8	0.26	0.8	0.35	0.35	0.25	0.28
NOTES	1,2	1,2,5	1,2	1,2	1,2	1,2,5	1,2,4	1,2,5	1,2,5	1,2,5	1,2,5	1,2,5	1,2,5	1,2	1,2

TERMINAL AIR BOX SCHEDULE - AHU-2A (ADDITION)

REFERENCE	TAB-B147	TAB-B150A	TAB-B150B	TAB-B151	TAB-B153	TAB-B155	TAB-B156	TAB-B157	TAB-B158	TAB-B160	TAB-B162	TAB-B166	TAB-B300	TAB-B310	TAB-B350
MANUFACTURER	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MODEL #	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV	DESV
TYPE	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW
SERVES	B147 - AUTOPSY TECHS	B150 - MAIN AUTOPSY	B150 - MAIN AUTOPSY	B151 - PASSAGE	B153 - DISCHARGE	B155 - DECOMP ISOLATION	B156 - DECOMP COOLER	B157 - MAIN COOLER	B158 - IMAGING	B160 - PPE/SHOE CHANGE	B162 - MEN'S LOCKER	B166 - WOMEN'S LOCKER	B300 - SALLY PORT	BIO WASTE / CHEM ST.	B350 - PENTHOUSE
WEIGHT (LBS)	56	97	97	56	69	97	43	47	89	47	43	43	78	43	78
DIMENSIONS - L x W x D (INCHES)	15.5x14x13	15.5x38x18	15.5x38x18	15.5x14x13	15.5x16x15	15.5x38x18	15.5x12x8	15.5x12x10	15.5x24x18	15.5x12x10	15.5x12x8	15.5x12x8	15.5x20x18	15.5x12x8	15.5x20x18
BOX SIZE / INLET SIZE (INCHES)	10	24 X 16	24 X 16	10	12	24 x 16	5	8	16	7	5	5	14	6	14
OCC. MAX COOLING AIRFLOW (CFM)	1150	4200	4450	1000	1650	4100	200	600	3150	450	250	250	2400	350	1750
OCC. MAX HEATING AIRFLOW (CFM)	770	4200	4450	1000	1650	4100	200	600	3150	300	170	170	1600	350	1170
MINIMUM AIRFLOW (CFM)	385	2100	2100	500	825	2050	200	600	1575	150	85	85	800	175	585
REHEAT COIL	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER
CAPACITY (MBH)	33.3	181.4	192.2	43.2	71.3	177.1	8.6	25.9	136.1	13.0	7.3	7.3	69.1	15.1	75.6
EAT (°F)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
LAT (°F)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
EWT (°F)	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130
LWT (°F)	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
FLOW RATE (GPM)	3.3	18.1	19.2	4.3	7.1	17.7	0.9	2.6	13.6	1.3	0.7	0.7	6.9	1.5	7.6
PRESSURE DROP (WPD) (FT. HD)	0.26	0.75	0.75	0.26	0.44	0.75	0.25	0.28	0.35	0.28	0.25	0.25	0.8	0.25	0.8
NOTES	1,2	1,2,5	1,2,5	1,2,5	1,2,5	1,2,5	1,2	1,2	1,2,5	1,2	1,2	1,2	1,2	1,2,5	1,2,3

NOTES:
1. NC SHALL NOT EXCEED 35. BOX A.P.D. SHALL NOT EXCEED 0.25".
2. MINIMUM AIR FLOWS SHOULD BE BALANCED TO MATCH MINIMUM VENTILATION AIR FLOW AS LISTED ON DRAWINGS.
3. UNIT IS ALSO USED FOR CHILLER PURGE MAKE UP, TAB BOX PERFORMANCE DURING PURGE MODE; 2450 CFM. REFER TO CONTROLS FOR MORE DETAILS.
4. UNIT IS USED FOR DRYER MAKE UP, NORMAL MAX OCCUPIED COOLING OPERATING CFM IS 300 CFM, AND NORMAL MAX OCCUPIED HEATING CFM IS 200 CFM. REFER TO CONTROLS FOR MORE DETAILS.
5. THE SPACE SERVED BY THIS UNIT HAS MINIMUM AIR CHANGE PER HOUR REQUIREMENTS. UNIT CFM VALUES SHALL NOT DROP BELOW VALUES LISTED.

FAN POWERED TERMINAL AIR BOX SCHEDULE - AHU-2

REFERENCE	FPV-B180	FPV-B181	FPV-B182	FPV-B183	FPV-B184	FPV-B190	FPV-B196	FPV-B198	FPV-B200	FPV-B202
MANUFACTURER	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MODEL #	DTFS	DTFS	DTFS	DTFS	DTFS	DTFS	DTFS	DTFS	DTFS	DTFS
TYPE	SERIES HW	SERIES HW	SERIES HW	SERIES HW	SERIES HW	SERIES HW	PARALLEL HW	PARALLEL HW	PARALLEL HW	PARALLEL HW
SERVES	B180 - OFFICE	B181 - OFFICE	B182 - OFFICE	B183 - OFFICE	B184 - OFFICE	B190 - BREAK	B196 - OFFICE	B198 - OFFICE	B200 - OFFICE	B202 - OFFICE
DDC TEMP SENSOR TYPE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE	ADJ & OVERRIDE
UNIT SIZE	D	C	A	A	A	E	A	A	A	A
WEIGHT (LBS)	237	162	129	129	129	237	129	129	129	129
DIMENSIONS - L x W x D (INCHES)	47.5x39x20	43x37x16	48x21x10.5	48x21x10.5	48x21x10.5	47.5x39x20	48x21x10.5	48x21x10.5	48x21x10.5	48x21x10.5
INLET SIZE (IN.)	12	10	6	6	6	14	6	6	6	6
PRIMARY AIRFLOW										
OCC. MAX COOLING AIRFLOW (CFM)	1,200	800	300	300	300	2,000	300	300	300	300
OCC. MAX HEATING AIRFLOW (CFM)	1,200	800	300	300	300	2,000	300	300	300	300
FAN										
MOTOR TYPE	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM
CFM	1,200	800	300	300	300	2,000	300	300	300	300
ESP (IN. W.C.)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
HEATING COIL										
CAPACITY (MBH)	26	17	8	8	8	43	8	8	8	8
EAT (°F)	70	70	70	70	70	70	70	70	70	70
LAT (°F)	90	90	95	95	95	90	95	95	95	95
EWT (°F)	130	130	130	130	130	130	130	130	130	130
LWT (°F)	110	110	110	110	110	110	110	110	110	110
FLOW RATE (GPM)	2.6	1.7	0.8	0.8	0.8	4.6	0.8	0.8	0.8	0.8
PRESSURE DROP (WPD) (FT. HD)	1.0	0.4	0.3	0.3	0.3	1.2	0.3	0.3	0.3	0.3
UNIT ELECTRICAL DATA										
MCA	5.1	3.2	3.2	3.2	3.2	6.9	3.2	3.2	3.2	3.2
MOCP	15	15	15	15	15	15	15	15	15	15
FAN VOLTAGE/PH	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1	277/1
NOTES	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4

02 ADD

NOTES:
1. PROVIDE SINGLE POINT POWER CONNECTION AND INTEGRAL DISCONNECT FOR FAN.
2. NC SHALL NOT EXCEED 35. BOX A.P.D. SHALL NOT EXCEED 0.50" (INCLUDING ALL APPURTENANCES).
3. PROVIDE BOXES WITH 1" FIBERGLASS LINER.
4. PROVIDE EMPTY CONTROL BOX, CONTROLS WILL BE FIELD INSTALLED BY TEMPERATURE CONTROL CONTRACTOR.

TERMINAL AIR BOX SCHEDULE - AHU-2

REFERENCE	TAB-B171	TAB-B172	TAB-B173	TAB-B175	TAB-B188	TAB-B193	TAB-B199
MANUFACTURER	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MODEL #	DESV	DESV	DESV	DESV	DESV	DESV	DESV
TYPE	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW	SINGLE HW
SERVES	B171 - PASSAGE	B172 - DECOMPRESS	B173 - MOTHERS RM	B175 - CONFERENCE	B188 - CONFERENCE	B193 - OBSERVATION	B199 - OFFICE/STOR.
WEIGHT (LBS)	43	43	43	43	43	43	47
DIMENSIONS - L x W x D (INCHES)	15.5x12x8	15.5x12x8	15.5x12x8	15.5x12x8	15.5x12x8	15.5x12x8	15.5x12x10
BOX SIZE / INLET SIZE (INCHES)	6	4	5	6	6	4	7
OCC. MAX COOLING AIRFLOW (CFM)	400	150	225	375	400	150	475
OCC. MAX HEATING AIRFLOW (CFM)	270	100	150	250	270	100	320
OCC. MINIMUM AIRFLOW (CFM)	135	50	75	125	135	50	160
REHEAT COIL	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER	HOT WATER
CAPACITY (MBH)	11.7	4.3	6.5	10.8	11.7	4.3	13.8
EAT (°F)	55	55	55	55	55	55	55
LAT (°F)	95	95	95	96	95	95	95
EWT (°F)	130	130	130	130	130	130	130
LWT (°F)	110	110	110	110	110	110	110
FLOW RATE (GPM)	1.2	0.4	0.6	1.1	1.2	0.4	1.4
PRESSURE DROP (WPD) (FT. HD)	0.25	0.25	0.25	0.25	0.25	0.25	0.28
NOTES	1,2	1,2	1,2	1,2	1,2	1,2	1,2

02 ADD

NOTES:
1. NC SHALL NOT EXCEED 35. BOX A.P.D. SHALL NOT EXCEED 0.25".
2. MINIMUM AIR FLOWS SHOULD BE BALANCED TO MATCH MINIMUM VENTILATION AIR FLOW AS LISTED ON DRAWINGS.

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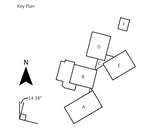
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SCH Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
MECHANICAL SCHEDULES

Sheet Number
M500

PRINTED: 12/4/2025 11:50:44 AM

DESIGN CONDITIONS — DES MOINES, IA

GENERAL NOTES:
1. OUTDOOR CONDITIONS BASED ON ASHRAE FUNDAMENTALS 2021 99.6% & 0.4% DATA.
2. DB = DRY BULB; DP = DEW POINT; HR = HUMIDITY RATIO; MCDB = MEAN COINCIDENT DRY BULB; MCWB = MEAN COINCIDENT WET BULB; RH = RELATIVE HUMIDITY.

SEASON / SPACE	WINTER		SUMMER	
	TEMPERATURE	HUMIDIFICATION / HUMIDITY	TEMPERATURE	DEHUMIDIFICATION / HUMIDITY
OUTDOOR	-4.4°F DB	-12.9°F DP / 2.8 HR / -3.2°F MCDB	93°F DB / 76.1°F MCWB	76°F DP / 140.8 HR / 85.7°F MCDB
INDOOR	70°F ± 2°F DB	50% RH MAX, NO MINIMUM	75°F ± 2°F DB	50% RH MAX, NO MINIMUM

RADIATOR SCHEDULE

REFERENCE	RAD-1	RAD-2
MANUFACTURER	INDEECO	INDEECO
MODEL #	RCI	RCI
TYPE	ELECTRIC	ELECTRIC
STYLE	COVE	COVE
SERVES	B164 - TLT/SHOWER	B168 - TLT/SHOWER
MOUNTING	WALL	WALL
WEIGHT (LBS)	7	7
DIMENSIONS - L x W x D (INCHES)	59 x 4.5 x 4	59 x 4.5 x 4
CAPACITY (WATTS)	750	750
ELECTRICAL		
VOLTAGE - PH	120 - 1	120 - 1
AMP	6.2	6.2
NOTES	1,2	1,2

NOTES:
1. PROVIDE INTEGRAL TEMPERATURE SENSOR & INTEGRAL DISCONNECT.
2. UNIT TO BE WALL MOUNTED. PROVIDE NECESSARY MOUNTING BRACKETS/SUPPORTS AS REQUIRED.

ELECTRIC UNIT HEATER SCHEDULE

REFERENCE	EUH-1
MANUFACTURER	INDECCO
MODEL #	UHIR
SERVES	PUMP ROOM
WEIGHT (LBS)	25
DIMENSIONS - L x W x H (INCHES)	13 x 8 x 18
TYPE	ELECTRIC
AIRFLOW (CFM)	350
ELECTRIC COIL (KW)	2.5
DISCHARGE AIR TEMP. RISE (DEG. F)	23
CONTROL AMPS (24 VOLT)	1.0
ELECTRICAL	
VOLTAGE - PHASE	277 - 1
AMPS	9.4
NOTES	1,2,3,4

NOTES:
1. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION AND INTEGRAL DISCONNECT.
2. PROVIDE UNIT WITH INTEGRAL THERMOSTAT
3. UNIT TO INCLUDE ALL MOUNTING BRACKETS. HARDWARE, ETC. FOR COMPLETE INSTALL.
4. MOUNT UNIT HEATER WHERE BOTTOM IS AT MINIMUM OF 12'-0" AFF, OR AS RECOMMENDED BY UNIT MFR.

CABINET UNIT HEATER SCHEDULE

REFERENCE	CUH-1	CUH-2
MANUFACTURER	INDEECO	INDEECO
MODEL #	WAI	WAI
WEIGHT (LBS)	25	25
DIMENSIONS - L x W x D (INCHES)	20 x 16 x 5	20 x 16 x 5
TYPE	SEMI RECESSED	SEMI RECESSED
HEATING	ELECTRIC	ELECTRIC
SERVES	B176	B223
AIRFLOW (CFM)	100	100
KILOWATTS	3.0	3.0
AMPS	14.4	14.4
VOLTAGE - PH	208 - 1	208 - 1
NOTES	1,2,3	1,2,3

NOTES:
1. PROVIDE UNIT WITH INTEGRAL THERMOSTAT AND DISCONNECT.
2. UNIT COLOR TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD AND CUSTOM COLOR CHART.
3. PROVIDE UNIT WITH THROWAWAY 1" FILTERS.

MOTORIZED DAMPER SCHEDULE

REFERENCE	MOD-1
MANUFACTURER	TAMCO
MODEL	9000
SERVES	LV-2
WEIGHT (LBS)	25
DIMENSIONS - W x H (INCHES)	18 x 12
AIRFLOW (CFM)	300
BLADE STYLE	OPPOSED
BLADE DIRECTION	HORIZONTAL
INSULATED	YES
THERMALLY BROKEN	YES
ACTUATOR TYPE	ELECTRIC (120 V)
ACTUATOR STYLE	2 POSITION
POWER FAILURE POSITION	CLOSED
NOTES	1 THROUGH 2

NO SPECIFICATION SECTION HAS BEEN WRITTEN FOR MOTORIZED DAMPER UNIT. THEY ARE SPECIFIED BY THIS SCHEDULE AND SCHEDULE NOTES. SUBMIT UNDER SECTION.

NOTES:
1. EC TO POWER MOTORIZED DAMPER TO OPEN/CLOSE WITH EF-1 START OR STOP.
2. DAMPER SHOULD BE ULTRA LOW LEAK TYPE WITH INSULATED BLADES, BLADE AND SIDE SEALS.

LOUVER SCHEDULE

REFERENCE	L-1	L-2	L-3
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK
MODEL	ESD-435	ESD-635	ESD-635
WEIGHT (LBS)	500	8	8
DIMENSIONS - W x H (INCHES)	168 x 108	18x16	18x16
APPLICATION	INTAKE	INTAKE	EXHAUST
MATERIAL	ALUMINUM	ALUMINUM	ALUMINUM
AIRFLOW (CFM)	40,000	300	300
FREE AREA VELOCITY (FPM)	572	457	457
FREE AREA (SQ. FT.)	69.93	0.70	0.70
PRESSURE DROP (IN. W.C.)	<0.05	<0.06	<0.06
BLADE TYPE	FIXED	FIXED	FIXED
BLADE DIRECTION	HORIZONTAL	HORIZONTAL	HORIZONTAL
DRAINABLE	YES	YES	YES
NOTES	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5

NOTES:
1. CUSTOM COLOR LOUVERS TO MATCH METAL PANEL OR ARCHITECTS SAMPLE
2. COORDINATE INSTALLATION WITH WALL TYPE PRIOR TO ORDERING.
3. PROVIDE WITH BIRDSCREEN.
4. STATED SIZES ARE MINIMUM FOR PERFORMANCE, COORDINATE OVERALL LOUVER SIZES AND LOCATIONS WITH ARCHITECT.
5. RUSKIN, AMERICAN WARMING & VENTILATING ARE ACCEPTABLE MANUFACTURERS.

DUCT INSULATION SCHEDULE

DUCT TYPE	HVAC EQUIPMENT	DUCT DETAILS	PRESSURE CLASS	INSULATION TYPE	INSULATION THICKNESS
SUPPLY AIR AIR DUCT	FROM TERMINAL AIR BOXES	RECTANGULAR GALVANIZED STEEL	+2 INCH WG	WRAPPED MINERAL FIBER	1-1/2 INCH
		EXPOSED SPIRAL / OVAL GALVANIZED STEEL	+2 INCH WG	DOUBLE WALL INSULATED	1 INCH
		SPIRAL / OVAL GALVANIZED STEEL	+2 INCH WG	WRAPPED MINERAL FIBER	1-1/2 INCH
SUPPLY AIR DUCT	FROM AIR HANDLING UNITS	RECTANGULAR GALVANIZED STEEL	+3 INCH WG	WRAPPED MINERAL FIBER	1-1/2 INCH
		SPIRAL / OVAL GALVANIZED STEEL	+3 INCH WG	WRAPPED MINERAL FIBER	1-1/2 INCH
EXHAUST AIR DUCT	TO AIR HANDLING UNITS	RECTANGULAR GALVANIZED STEEL	-2 INCH WG	WRAPPED MINERAL FIBER	1 INCH
		SPIRAL / OVAL GALVANIZED STEEL	-2 INCH WG	WRAPPED MINERAL FIBER	1 INCH
OUTDOOR AIR DUCT FROM EXTERIOR TO UNIT	TO AIR HANDLING UNITS	RECTANGULAR GALVANIZED STEEL	+3 INCH WG	WRAPPED MINERAL FIBER	1-1/2 INCH
EXHAUST AIR DUCT	FROM EXHAUST FANS	ROUND / RECTANGULAR GALVANIZED STEEL	-2 INCH WG	N/A	N/A
EXHAUST AIR DUCT BELOW GRADE	FROM AUTOPSY TABLES	ROUND / RECTANGULAR HDPE	-2 INCH WG	N/A	N/A
TRANSFER DUCT	N/A	RECTANGULAR GALVANIZED STEEL	-1/2 INCH WG	LINED	1/2 INCH
FLEXIBLE DUCTS (UL-181, CLASS 1)	TO DIFFUSERS	2-PLY VINYL, HELICAL STEEL WIRE W/VAPOR BARRIER	+1 INCH WG	FIBROUS-GLASS INSULATION (R-6)	1-3/4 INCH

NOTES:
1. ALL DUCTWORK SHALL BE CONSTRUCTED AND ERECTED IN ACCORDANCE WITH 2021 INTERNATIONAL MECHANICAL CODE.

LINEAR DIFFUSER SCHEDULE

ID TAG	REFERENCE	MATERIAL	NUMBER OF SLOTS	SLOT WIDTH (IN)	LENGTH (IN)	DAMPER	PLENUM	PLENUM LINED	ADJUSTABLE SLOTS	MFR	MODEL	NOTES
LD-1	LINEAR SUPPLY	ALUMINUM	4	1"	48	NO	YES	YES	YES	TITUS	MLTI-39	1,2,3
LD-2	LINEAR SUPPLY	ALUMINUM	2	1"	72	NO	YES	YES	YES	TITUS	MLTI-39	1,3,4
RL-1	LINEAR RETURN	ALUMINUM	4	1"	48	NO	NO	NO	YES	TITUS	MLR-39	1,2,3
RL-2	LINEAR RETURN	ALUMINUM	2	1"	48	NO	NO	NO	YES	TITUS	MLR-39	1,3,4

NOTES:
1. REFER TO ARCH DRAWINGS FOR FINAL CEILING TYPE FOR MOUNTING TYPE.
2. PROVIDE WITH WHITE VANES AND TRIM.
3. PROVIDE CONCEALED FASTENERS WITH LINEAR DIFFUSER.
4. PROVIDE WITH BLACK VANES AND TRIM.

FAN SCHEDULE

REFERENCE	HPF-1	EF-1	EF-2	EF-3	EF-4	EF-5	EF-6	EF-7	EF-8
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK
MODEL #	VEKTOR-CH-44-8-III	G-080-VG	G-080-VG	G-140-VG	CUE-120-VG	G-130-A	CUE-120-VG	SQ-90-VG	CUE-140-VG
TYPE	HIGH PLUME	CENTRIFUGAL DOWN	CENTRIFUGAL DOWN	CENTRIFUGAL DOWN	CENTRIFUGAL UP	CENTRIFUGAL DOWN	CENTRIFUGAL UP	INLINE	CENTRIFUGAL UP
SERVES	LAB SPACE	RR / JAN	RR	RR / LOCKERS	FUME HOOD	SALLY PORT EXHAUST	STEAM KETTLE HOOD	PUMP ROOM	FORMALIN HOOD
WEIGHT (LBS)	14,000	40	40	75	65	100	65	34	80
DIMENSIONS - L x W x H (INCHES)	221 X 85 X 138	22 x 22 x 27	22 x 22 x 27	28 x 28 x 36	19 x 19 x 38	28 x 28 x 36	19 x 19 x 38	12 x 12 x 12	29 x 29 x 39
AIRFLOW (CFM)	50,000	225	225	1,580	830	2,000	750	300	1,050
ESP (IN. W.C.)	4.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
FAN SPEED (RPM)	1,298	1,276	1,276	1109	1073	1725	1035	1264	965
DRIVE TYPE	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT
SPEED CONTROL	YES	YES	YES	YES	YES	YES	YES	YES	YES
SONES	74	6	6	9.1	7.3	16.0	7.0	5.2	7.7
DAMPER TYPE	MOTORIZED	MOTORIZED	MOTORIZED	MOTORIZED	MOTORIZED	MOTORIZED	MOTORIZED	MOTORIZED	MOTORIZED
MOTOR HP	100.0	1/10	1/10	1/2	1/4	3/4	1/4	1/6	1/4
VOLTAGE - PHASE	480 - 3	120 - 1	120 - 1	120 - 1	120 - 1	120 - 1	120 - 1	120 - 1	120 - 1
MCA	-	1.9	1.9	8.2	4.8	17	4.8	3.5	4.8
MOCP	-	15	15	15	15	30	15	15	15
NOTES	3,4,5,6,9,11,12	1,2,3,4,5,6,7,14	1,2,3,4,5,6,7,14	1,2,3,4,5,6,7	1,2,3,4,5,6,7,8,10	1,2,3,4,5,6,7	1,2,3,4,5,6,7,8	1,2,3,5,6,7,8,13	1,2,3,4,5,6,7,8

ADD (EF-1, EF-2, EF-7, EF-8)

NOTES:
1. PROVIDE WITH DAMPER AND 115 VAC ACTUATOR WITH UNIT. DAMPER SHALL BE PROVIDED WITH END SWITCHES TO PROVE OPEN.
2. EC TO POWER MOTORIZED DAMPER TO OPEN/CLOSE WITH FAN START OR STOP.
3. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION AND DISCONNECT.
4. PROVIDE MINIUM 14" ROOF CURB. DISTANCE MEASURED FROM BOTTOM OF FAN BASE TO TOP OF ROOF.
5. PROVIDE WITH STAINLESS STEEL FASTENERS.
6. REFER TO CONTROL DRAWINGS FOR ADDITIONAL DETAILS.
7. INSTALL SPEED CONTROLLER UNDER FAN SHROUD FOR BALANCING.
8. PROVIDE SEPARATE WALL SWITCH FOR FAN OPERATION.
9. VFD WITH INTEGRAL DISCONNECT PROVIDED BY TCC. VFD INSTALLED BY EC.
10. EF-4 CONTROLLED BY INTEGRAL SWITCH PROVIDED WITH FUME HOOD.
11. PROVIDE WITH HEAVY DUTY ISOLATION DAMPERS.
12. UNIT TO BE 2 FAN SYSTEM WHERE ONLY 1 FAN IS TO OPERATE AT A TIME.
13. EC TO POWER MOD-1 (LV-2) TO OPEN WITH FAN OPERATION.
14. FAN TO RUN CONTINUOUSLY.

GRILLES REGISTERS AND DIFFUSERS SCHEDULE

REFERENCE	MATERIAL	MARGIN (IN)	INLET (IN)	FACE (IN)	DAMPER	MFR	MODEL	NOTES
CD-1 (SUPPLY DIFFUSER)	ALUMINUM	NA	SEE DWG	24 x 24	YES	TITUS	OMNI	1,2
CD-2 (SUPPLY DIFFUSER)	STAINLESS STEEL	1 1/4"	SEE DWG	48 x 12	YES	TITUS	TLFR	1,4
CD-3 (SUPPLY DIFFUSER)	STAINLESS STEEL	1 1/4"	SEE DWG	60 x 12	YES	TITUS	TLFR	1,4
CD-4 (SUPPLY DIFFUSER)	STAINLESS STEEL	1 1/4"	SEE DWG	48 x 24	YES	TITUS	TLFR	1,4
SG-1 (SUPPLY GRILLE)	ALUMINUM	1 1/4"	SEE DWG	INLET +2	YES	TITUS	272FL	2,3
RG-1 (RETURN GRILLE)	STEEL	NA	22 x 22	24 x 24	NO	TITUS	PAR-AA	1,2,5
RG-2 (RETURN GRILLE)	ALUMINUM	1 1/4"	SEE DWG	INLET +2"	NO	TITUS	350RL	1,2,3
EG-1 (EXHAUST GRILLE)	ALUMINUM	NA	SEE DWG	24 x 24	YES	TITUS	PAR-AA	1,2
EG-2 (EXHAUST GRILLE)	STAINLESS STEEL	1 1/4"	SEE DWG	INLET +2"	YES	TITUS	350RL-SS	1,3
EG-3 (EXHAUST GRILLE)	ALUMINUM	1 1/4"	SEE DWG	INLET +2"	YES	TITUS	350RL	1,2,3
EG-4 (EXHAUST GRILLE)	STAINLESS STEEL	1 1/4"	SEE DWG	INLET +2"	YES	TITUS	50R-SS	1,3

NOTES:
1. REFER TO ARCH DRAWINGS FOR FINAL CEILING TYPE FOR MOUNTING TYPE.
2. PROVIDE WITH WHITE FINISH, UNLESS NOTED OTHERWISE. COORDINATE COLOR SELECTION WITH ARCHITECT.
3. SURFACE / DUCT MOUNT.
4. DAMPER TO BE RADIAL
5. PROVIDE WITH RETURN CANOPY (TITUS RCP OR SIMILAR).

SPLIT SYSTEM INDOOR UNIT SCHEDULE

REFERENCE	SSI-1
MANUFACTURER	MITSUBISHI
MODEL #	PKA-A12LA1
TYPE	WALL MOUNT
SERVES	B222 - IDF
WEIGHT (LBS)	28
DIMENSIONS - L x W x D (INCHES)	36 x 10 x 12
NOMINAL CAPACITY (TONS)	1.00
MAX UNIT AIRFLOW (CFM)	385
COOLING CAPACITY - RATED (BTU/H)	12,000
HEATING CAPACITY - RATED (BTU/H)	N/A
REFRIGERANT TYPE	R410A
VOLTAGE - PH	208 - 1
ELECTRICAL DATA	
MCA	1.00
MOCP	SEE SSO SCHEDULE
NOTES	1,2,3,4

NOTES:
1. PROVIDE WITH REMOTE WALL MOUNTED THERMOSTAT. WIRING BY M.C.
2. INDOOR UNIT RECEIVES POWER FROM OUTDOOR UNIT BY INTERCONNECTED WIRING PROVIDED WITH UNIT, WIRING INSTALLATION AND DISCONNECT BY E.C.
3. PROVIDE FILTER WITH UNIT.
4. UNIT IS COOLING ONLY.

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE

REFERENCE	SSO-1
MANUFACTURER	MITSUBISHI
MODEL #	PUY-A12NKA7
SERVES	SSI-1
WEIGHT (LBS)	92
DIMENSIONS W/ CURB & ACCESSORIES - L x W x H (INCHES)	32 x 16 x 48
NOMINAL CAPACITY (TONS)	1.00
COOLING CAPACITY - RATED (BTU/H)	12,000
HEATING CAPACITY - RATED (BTU/H)	N/A
REFRIGERANT TYPE	R410A
COMPRESSOR QUANTITY	1
EFFICIENCY - SEER	21.3
ELECTRICAL DATA	
VOLTAGE - PH	208 - 1
MCA	11
MOCP	28
NOTES	1,2,3,4

NOTES:
1. DISCONNECT SHALL BE PROVIDED / INSTALLED BY E.C.
2. UNIT TO BE MOUNTED ON PREFABRICATED ROOF CURB PER MFR RECOMMENDATIONS; MINIMUM 24 INCHES ABOVE TOP OF ROOFING. VERIFY & COORDINATE WITH ROOF CONSTRUCTION AND INSULATION.
3. REFER TO SPLIT SYSTEM INDOOR UNIT SCHEDULE FOR CAPACITY RATING CONDITIONS.
4. SYSTEM REQUIRES LOW AMBIENT AIR COOLING OPERATION (-20 °F), PROVIDE LOW AMBIENT WIND BAFFLES, SNOW AND HAIL GUARDS.

AHU SCHEDULE

REFERENCE	AHU-2A
MANUFACTURER	ANNEXAIR
MODEL #	ERU-1-40-FP-CW-CW-HW-SS-CA-4
SERVES	AUTOPSY LAB SPACES
APPROXIMATE WEIGHT W/ CURB & ACCESSORIES (LBS)	24,000
DIMENSIONS W/ CURB, HOOD & ACCESSORIES - L x W x H (INCHES)	533 X 192 X 146
FAN PERFORMANCE	
SUPPLY FAN	
AIRFLOW (CFM)	45,000
ESP (IN. W.C.)	3
MOTOR HP (QUANTITY)	11 (8)
MOTOR BHP	10 (8)
COOLING PERFORMANCE	
COIL TYPE	CHILLED WATER
FLUID	WATER
EAT - DB / WB (°F)	81.7 / 74.5
LAT - DB / WB (°F)	40 / 40
NET TOTAL CAPACITY (MBH)	4607
NET SENSIBLE CAPACITY (MBH)	2060
FLOWRATE (GPM)	921
EWT (°F)	36
LWT (°F)	46
PRESSURE DROP (FT HD)	25
HEATING PERFORMANCE	
TYPE	HEATING WATER
FLUID	WATER
EAT - DB (°F)	12.7
LAT - DB (°F)	60
TOTAL CAPACITY (MBH)	2299
FLOWRATE (GPM)	230
LWT (°F)	130
EWT (°F)	110
PRESSURE DROP (FT HD)	15
HUMIDIFIER	
ENTERING AIR - GRAINS/LB	2
LEAVING AIR - GRAINS/LB	30.4
ENERGY RECOVERY	
TYPE	TOTAL / FIXED PLATE CORE
MATERIAL	ALUMINUM
DEFROST CONTROL	FACE & BYPASS
SUMMER EAT - DB / WB (°F)	95 / 78
SUMMER RAT - DB / WB (°F)	70 / 59
SUMMER LAT - DB / WB (°F)	81.7 / 74.5
WINTER EAT - DB (°F)	-20
WINTER RAT - DB / WB (°F)	70 / 59
WINTER LAT - DB / WB (°F)	12.6 / 8
OUTDOOR AIRFLOW (CFM)	45,000
EXHAUST AIRFLOW (CFM)	50,000
ELECTRICAL DATA	
VOLTAGE - PH	480 - 3
FLA	111
MCA	115
MOP	125
NOTES	1,2,3,4,5,6,7,8,9,10

NOTES:
1. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION AND NON-FUSED DISCONNECT.
2. REFER TO CONTROL DRAWINGS FOR ADDITIONAL DETAILS. DDC CONTROLS PROVIDED AND FIELD INSTALLED BY SIEMENS.
3. REFER TO SPECIFICATIONS FOR FILTER TYPES AND SIZE.
4. UNIT SUPPLY FANS ARE VARIABLE SPEED. FACTORY PROVIDED ASSOCIATED VFDS, ONE PER MOTOR (8 TOTAL). EACH FAN SHALL HAVE A BACKDRAFT DAMPER.
5. PROVIDE UNIT WITH OUTDOOR LOW-LEAK DAMPERS; DAMPERS TO BE HARDWIRED TO CLOSE WHEN UNIT IS OFF.
6. PROVIDE UNIT WITH BYPASS DAMPER TO BYPASS O.A. ROUND RECOVERY CORE DURING FOR DEFROST AND ECONOMIZER. REFER TO CONTROL DRAWINGS FOR DETAILS.
7. PROVIDE UNIT WITH OPD, PREMIUM EFFICIENCY FAN MOTORS.
8. UNIT WILL REQUIRE SOME FIELD WIRING BETWEEN MODULES FOR ASSEMBLY ON SITE. COORDINATE WITH EC.
9. SHOWN COOLING COIL PERFORMANCE IS 2 COILS IN SERIES WITH MAXIMUM OF 6 ROWS EACH FOR CLEANABILITY.
10. PROVIDE UNIT WITH BLENDERS FOR FREEZE PROTECTION DURING DEFROST MODE.
11. PROVIDE AHU WITH SCCR RATING OF 30,0000 AMPS.

EXHAUST VALVE SCHEDULE - AHU-2A

REFERENCE	SERVES	CFM MAX	CFM MIN	INLET SIZE	MANUFACTURER	MODEL	NOTES
GE-B128	B128 - WAITING	380	135	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B132	B132 - AUTOPSY TRANSITION	1100	550	10"	CRITICAL ROOM CONTROL	CLV-SP-110	1
GE-B135A	B135 - TISSUE PREP	290	0	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B135	B135 - TISSUE PREP	540	270	8"	CRITICAL ROOM CONTROL	CLV-SP-108	1
GE-B137	B137 - VEST	220	80	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B139	B139 - LONG TERM STORAGE	330	110	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B141	B141 - TISSUE RECOVERY	1045	525	10"	CRITICAL ROOM CONTROL	CLV-SP-110	1
GE-B142	B142 - DIRTY LAUNDRY	330	110	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B143	B143 - CART WASH	450	220	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B144	B144 - ANTHRO	2715	1320	16"	CRITICAL ROOM CONTROL	CLV-SP-116	1
GE-B145	B145 - INTAKE	1100	550	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B146	B146 - EVIDENCE	2750	1375	16"	CRITICAL ROOM CONTROL	CLV-SP-116	1
GE-B147	B147 - AUTOPSY TECHS	1265	425	10"	CRITICAL ROOM CONTROL	CLV-SP-110	1
GE-B150A	B150 - MAIN AUTOPSY	1550	770	12"	CRITICAL ROOM CONTROL	CLV-SP-112	1
GE-B150B	B150 - MAIN AUTOPSY	1550	770	12"	CRITICAL ROOM CONTROL	CLV-SP-112	1
GE-B150C	B150 - MAIN AUTOPSY	1550	770	12"	CRITICAL ROOM CONTROL	CLV-SP-112	1
GE-B150D	B150 - MAIN AUTOPSY	3100	1540	DUAL 12"	CRITICAL ROOM CONTROL	CLV-SP-212	1
GE-B150E	B150 - MAIN AUTOPSY	1550	770	12"	CRITICAL ROOM CONTROL	CLV-SP-112	1
GE-B150F	B150 - MAIN AUTOPSY	1550	770	12"	CRITICAL ROOM CONTROL	CLV-SP-112	1
GE-B150G	B150 - MAIN AUTOPSY	3100	1540	DUAL 12"	CRITICAL ROOM CONTROL	CLV-SP-212	1
GE-B150H	B150 - MAIN AUTOPSY	1550	770	12"	CRITICAL ROOM CONTROL	CLV-SP-112	1
GE-B151	B151 - AUTOPSY TRANSITION	1100	550	10"	CRITICAL ROOM CONTROL	CLV-SP-110	1
GE-B153	B153 - DISCHARGE	1815	910	12"	CRITICAL ROOM CONTROL	CLV-SP-212	1
GE-B154	B154 - BODY COOLER	300	300	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B155	B155 - DECOMP ISOLATION	4510	2255	DUAL 14"	CRITICAL ROOM CONTROL	CLV-SP-214	1
GE-B156	B156 - DECOMP COOLER	200	200	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B157	B157 - MAIN COOLER	600	600	8"	CRITICAL ROOM CONTROL	CLV-SP-108	1
GE-B158	B158 - IMAGING	3465	1740	DUAL 14"	CRITICAL ROOM CONTROL	CLV-SP-214	1
GE-B160	B160 - PPE / SHOE CHANGE	495	165	8"	CRITICAL ROOM CONTROL	CLV-SP-108	1
GE-B162	B162 - MEN'S LOCKER	275	95	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B166	B166 - WOMEN'S LOCKER	275	95	6"	CRITICAL ROOM CONTROL	CLV-SP-106	1
GE-B300	B300 - SALLY PORT	2400	740	16"	CRITICAL ROOM CONTROL	CLV-SP-116	1
GE-B310	B310 - BIO WASTE/ STORAGE	930	310	8"	CRITICAL ROOM CONTROL	CLV-SP-108	1
GE-B350	B350 - PENTHOUSE	1925	645	14"	CRITICAL ROOM CONTROL	CLV-SP-114	1,2

NOTES:
1. NC SHALL NOT EXCEED 35. BOX A.P.D. SHALL NOT EXCEED 0.25".
2. UNIT IS ALSO USED FOR CHILLER PURGE EXHAUST, GE BOX PERFORMANCE DURING PURGE MODE; 2650 CFM. REFER TO CONTROLS FOR MORE DETAILS.

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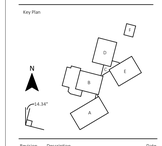
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

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Sheet Name
MECHANICAL SCHEDULES

Sheet Number
M501

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BOILER SCHEDULE

REFERENCE	B-1 & B-2
MANUFACTURER	LAARS
MODEL #	MAGNATHERM HTD 4000
SERVES	BUILDING B
WEIGHT (LBS)	3,000
DIMENSIONS - L x W x H (INCHES)	70 X 35 X 96
INPUT (MBH)	4,000
OUTPUT AT MAX. EFFICIENCY (MBH)	3,800
FLOW RATE (GPM)	300
EWT (°F)	160
LWT (°F)	180
PRESSURE DROP (FT HD)	47
TURN DOWN RATE	MODULATING (20:1)
THERMAL EFFICIENCY (%)	95
OPERATING GAS PRESSURE (IN. W.C.)	7 - 14
COMBUSTION AIR INTAKE	12" SCH. 80 CPVC
EXHAUST FLUE	12" AL-429-C (CAT. IV)
ELECTRICAL DATA	
VOLTAGE - PHASE	208 / 3
MCA	12
MOCP	20
NOTES	1,2,3,4,5

NOTES:
1. PROVIDE BACNET INTERFACE MODULE FOR CONNECTION TO DDC SYSTEM.
2. PROVIDE BOILER MANUFACTURER RECOMMENDED CONDENSATE NEUTRALIZATION KIT FOR ALL CONDENSATE DRAINS FROM BOILER AND BOILER FLUE.
3. PROVIDE BOILER WITH MANUFACTURER RECOMMENDED BOILER FEED PUMP (300 GPM, 7.5HP, 480/3V), PUMP VFD WITH INTEGRAL DISCONNECT PROVIDED BY TCC. (BP-1 & BP-2) VFD'S INSTALLED BY EC.
4. BOILER FEED PUMP TO ENABLE/DISABLE WITH BOILER OPERATION.
5. REFER TO CONTROL DRAWINGS FOR ADDITIONAL DETAILS.

COOLING TOWER SCHEDULE

REFERENCE	CT-3
MANUFACTURER	MARLEY
MODEL #	NC8403SLS1
SERVES	CH-3
DIMENSIONS (FT - WxLxH)	18.1' X 8.5' X 16.5'
MIN. C.T.I. TONS	400
TOWER GPM	1,150
CONDENSER WATER EWT/LWT (°F)	95 / 85
AMBIENT CONDITIONS DB/WB (°F)	95 / 79
FAN HP	1 FAN TOTAL (30 HP TOTAL)
FAN RPM	389
DRIVE TYPE	GEAR
AIR FLOW PER CELL (CFM)	116,550
NUMBER OF CELLS	1
MINIMUM TOWER CAPACITY (MBH)	5,714
OPERATING WEIGHT (LBS)	16,000
FLA	46
MOCP	90
VOLTAGE/PH	480/3
NOTES	1,2,3,4,5,6,7,8,9

NOTES:
1. REFER TO CONTROL DRAWINGS.
2. UNIT SHALL BE PROVIDED WITH SINGLE POINT POWER CONNECTION AND INTEGRAL DISCONNECT.
3. FAN VFD PROVIDED BY TOWER MFR. PROVIDE SHAFT GROUNDING FOR FAN MOTOR.
4. PROVIDE WITH STAINLESS STEEL FOR THE FOLLOWING: CASING, STRUCTURE, COLLECTION AND DISTRIBUTION BASINS.
5. PROVIDE TOWER WITH DEPRESSED SIDE OUTLET AND SINGLE BOTTOM INLET.
6. PIPING FROM BOTTOM INLET TO HOT WATER BASIN SHALL BE PROVIDED BY TOWER MFR.
7. PROVIDE TOWER WITH BIRDSCREEN ON AIR INLETS AND LADDER TO BASIN.
8. PROVIDE WITH MOTOR IN THE AIRSTREAM.

CHILLER SCHEDULE

REFERENCE	CH-3
MANUFACTURER	TRANE
MODEL #	CVHE 500
TYPE	WATER COOLED
SERVES	AHU-2A
OPERATING WEIGHT (LBS)	22,500
DIMENSIONS - L x W x H (INCHES)	165 x 110 x 103
NOMINAL CAPACITY (TON)	400
FULL LOAD EFFICIENCY (KW/TON)	0.6515
NPLV.IP (KW/TON)	0.4373
REFRIGERANT	R514A
REFRIGERANT CHARGE (LBS)	700
EVAPORATOR FLUID	WATER
EVAPORATOR FLOW (GPM)	955
EVAPORATOR ENT. TEMP. (°F)	46
EVAPORATOR LVG. TEMP. (°F)	36
EVAP. PRESS. DROP (FT HD)	44.8
CONDENSER FLOW (GPM)	1,150
CONDENSER ENT. TEMP. (°F)	85
CONDENSER LVG. TEMP. (°F)	95
COND. PRESS. DROP (FT HD)	10
NUMBER OF CIRCUITS	1
NUMBER OF COMPRESSORS	1
CAPACITY STEPS	MULTI STAGE GUIDE VANES
ELECTRICAL DATA	
VOLTAGE / PHASE	460/3
COMPRESSOR POWER (RLA)	374
TOTAL UNIT POWER (kW)	261
SINGLE POINT MCA	435
SINGLE POINT MOCP	700
STARTER TYPE	VFD
NOTES	1,2,3,4,5,6,7,8,9,10

NOTES:
1. UNIT PROVIDED WITH FACTORY INSTALLED FREEZE PROTECTION.
2. PROVIDE WITH SINGLE POINT POWER & NON-FUSED DISCONNECT.
3. PROVIDE WITH SPRING ISOLATORS, 2 INCH DEFLECTION.
4. PROVIDE UNIT WITH FACTORY CONTROLS FOR VARIABLE PRIMARY FLOW.
5. PROVIDE WITH THERMAL DISPERSION PROVING SWITCHES.
6. PROVIDE UNIT WITH FACTORY INSTALLATION.
7. PROVIDE UNIT WITH FACTORY CAPACITY CONTROLS CALCULATION AND POWER METER.
8. PROVIDE UNIT WITH FULL 5 YEAR PARTS AND LABOR WARRANTY INCLUDING REFRIGERANT.
9. CHILLER TURNDOWN SHALL BE 20% WITH CONSTANT CONDENSER WATER TEMPERATURE. CHILLER SHALL TURN DOWN TO A MINIMUM FLOW OF 235 GPM OR LOWER.
10. PROVIDE UNIT WITH SCCR RATING OF 30,0000 AMPS.

HVAC PIPING AND INSULATION SCHEDULE

SYSTEM	PIPE SIZE (INCHES)	PIPE MATERIAL (NOTE 1)	JOINT TYPE (NOTE 1)	SHUT-OFF VALVE TYPE (NOTE 4)	INSULATION TYPE (NOTE 2,3)	INSULATION THICKNESS (INCHES)	JACKET (NOTE 5)	NOTES
CHILLED WATER	3/4 - 1 1/4	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	POLYISOCYANURATE	1	PVC	
CHILLED WATER	1 1/2 - 2	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	POLYISOCYANURATE	1	PVC	
CHILLED WATER	2 1/2 - 10	SCHED. 40 STEEL	GROOVED OR WELDED	DUCTILE IRON, BUTTERFLY	POLYISOCYANURATE	1	PVC	
COIL CONDENSATE DRAIN	3/4 - 1 1/4	SCH 40 PVC DWV	SOLVENT	N/A	MINERAL FIBER	1/2	--	
COIL CONDENSATE DRAIN	1 1/2 - 3	SCH 40 PVC DWV	SOLVENT	N/A	MINERAL FIBER	1	--	
COIL CONDENSATE DRAIN	3/4 - 1 1/4	TYPE L COPPER	SOLDER OR PRESS	N/A	MINERAL FIBER	1/2	--	
COIL CONDENSATE DRAIN	1 1/2 - 3	TYPE L COPPER	SOLDER OR PRESS	N/A	MINERAL FIBER	1	--	
CONDENSER WATER PIPING	3/4 - 2	SCHED. 40 STEEL	THREADED	BRONZE BALL, SS TRIM	--	--	PVC	
CONDENSER WATER PIPING	2 1/2 - 10	SCHED. 40 STEEL	GROOVED OR WELDED	DUCTILE IRON, BUTTERFLY	--	--	PVC	
CONDENSER WATER PIPING (EXTERIOR)	2 1/2 - 10	FIBERGLASS	BELL AND SPIGOT/ADHESIVE	DUCTILE IRON, BUTTERFLY	--	--	--	
HEATING WATER PIPING	3/4 - 1 1/4	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	MINERAL FIBER	1 1/2	PVC	
HEATING WATER PIPING	1 1/2 - 2	TYPE L COPPER	SOLDER OR PRESS	BRONZE BALL, SS TRIM	MINERAL FIBER	2	PVC	
HEATING WATER PIPING	2 1/2 - 10	SCHED. 40 STEEL	GROOVED OR WELDED	DUCTILE IRON, BUTTERFLY	MINERAL FIBER	2	PVC	

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER PIPE MATERIAL, JOINT AND INSTALLATION REQUIREMENTS. PUSH TO CONNECT / PUSH ON TYPE CONNECTIONS ARE NOT ALLOWED. EXCEPT FOR EXTERIOR CONDENSER WATER PIPING.
2. REFER TO SPECIFICATIONS FOR FURTHER INSULATION REQUIREMENTS. INSULATION R-VALUE SHALL MEET ENERGY CODE REQUIREMENTS.
3. INSULATION APPLIED TO PIPING LOCATED IN RETURN AIR PLENUMS SHALL MEET ASTM E84 25/50 FLAME AND SMOKE SPREAD RATING, AND COMPLY WITH NFPA STANDARD 90A.
4. REFER TO SPECIFICATIONS FOR FURTHER VALVE REQUIREMENTS.
5. EXPOSED PIPING MOUNTED BELOW 8'-0" ABOVE FLOOR SHALL HAVE PVC JACKET.

ADD 02 ADD

HYDRONIC ACCESSORIES SCHEDULE

REFERENCE	AS-1	AS-2	ET-1	ET-2	PF-1	PF-2	BT-1
TYPE	AIR SEPARATOR	AIR SEPARATOR	EXPANSION TANK	EXPANSION TANK	POT FEEDER	POT FEEDER	BUFFER TANK
MANUFACTURER	SPIROTHERM	SPIROTHERM	AMTROL	AMTROL	JL WINGERT	JL WINGERT	TACO
MODEL #	VDT600	VDT600	600-L	400-L	PF-DB-5HD	PF-DB-5HD	BTH2500F
SERVES	HEATING WATER	CHILLED WATER	HEATING WATER	CHILLED WATER	HEATING WATER	CHILLED WATER	CHILLED WATER
TYPE	N/A	N/A	BLADDER	BLADDER	N/A	N/A	VERTICAL
WEIGHT (LBS)	400	400	1600	1000	40	40	5340
DIMENSIONS - DIAMETER (INCHES)	15	15	30	24	12	12	84
FLOWRATE (GPM)	600	900	-	-	-	-	-
FIELD PRESSURE SETTING (PSI)	-	-	25	25	-	-	-
MIN. TOTAL VOLUME (GAL)	-	-	53	53	5	5	2500
MIN. ACCEPTANCE VOLUME (GAL)	-	-	53	53	-	-	-
PIPE CONNECTION SIZE / TYPE	6" / FLANGED	6" / FLANGED	1" / THREADED	1" / THREADED	3/4" / THREADED	3/4" / THREADED	6"
NOTES	1	1	1,2,3,4,5	1,2,3,4,5	1,6	1,6	1

NOTES:
1. SEE SPECIFICATION 232116 FOR ADDITIONAL DETAILS.
2. ASME RATED TANK IS REQUIRED.
3. PROVIDE AIR SIDE PRESSURE GAUGE.
4. PROVIDE WITH QUICK FILL KIT AND SIGHT GLASS.
5. WELDED STEEL TANK, 125 PSIG WORKING PRESSURE, 375 DEG F MAX OPERATING TEMP, ASME SECTION VIII DIVISION 1, BUTYL BLADDER SECURELY SEALED INTO TANK TO SEPARATE AIR CHARGE FROM SYSTEM WATER, SCHRADER AIR VALVE, STAINLESS STEEL WITH EPDM SEATS. OTHER APPROVED MANUFACTURERS: ARMSTRONG, BELL & GOSSETT, TACO.
6. STEEL FEEDER WITH CORROSION RESISTANT EXTERIOR COATING, 3 1/2" FILL OPENING IN TOP, NPS 3/4 BOTTOM INLET AND TOP SIDE OUTLET, QUARTER TURN OR THREADED FILL CAP WITH GASKET SEAL AND DIAPHRAGM, FUNNEL ACCESSORY, 100 MICRON STARTUP FILTER, BAG OF SIX (6) 20 MICRON FILTERS FOR INSTALLATION AFTER STARTUP.

HUMIDIFIER SCHEDULE

REFERENCE	HUM-1
MANUFACTURER	NEPTRONIC
STEAM GENERATOR MODEL #	SKG4N8104NB
SERVICE	INSTALL IN AHU-2A
TYPE	GAS STEAM GENERATOR
OPERATING WEIGHT (LBS)	1,765
OUTSIDE AIRFLOW CFM	40,000
DISPERSION MANIFOLD DIM. WxHxL (IN.)	96x54x22
ENCLOSURE, HEADERS, AND TUBES	REFER TO AHU
MAX. A.P.D. IN. W.C.	REFER TO AHU
MAX. DISSIPATION DISTANCE (IN.)	REFER TO AHU
STEAM PRESSURE	ATMOSPHERIC
OUTPUT (LB/HR)	810
HUMIDIFICATION LOAD (LB/HR)	810
TANK MATERIAL	316 SS
GAS INPUT (MBH)	996
AMP	8.7
VOLTAGE/PH	208/1
NOTES	1,2,3

NOTES:
1. E.C. TO PROVIDE DISCONNECT.
2. PROVIDE BACNET INTERFACE MODULE FOR CONNECTION TO DDC SYSTEM.
3. INTERCONNECTIONS BETWEEN MODULES REQUIRED ON FIELD.

UNIT HEATER SCHEDULE

REFERENCE	UH-1,2	UH-3	UH-4	UH-5
MANUFACTURER	TRANE	TRANE	TRANE	TRANE
MODEL #	UHS	UHS	UHS	UHS
SERVES	MAIN COOLER	SALLY PORT	SALLY PORT	SALLY PORT
WEIGHT (LBS)	24	31	31	31
TYPE	HOT WATER	HOT WATER	HOT WATER	HOT WATER
CAPACITY (MBH)	12	50	50	50
AIRFLOW (CFM)	500	1100	1100	1100
FLOWRATE (GPM)	1.9	6	6	6
LWT (°F)	110	110	110	110
EWT (°F)	130	130	130	130
PRESSURE DROP (FT HD)	2.2	4	4	4
DISCHARGE AIR TEMP. RISE (DEG. F)	34	39	39	39
ELECTRICAL				
VOLTAGE - PHASE	120 - 1	120 - 1	120 - 1	120 - 1
AMPS	0.8	1.4	1.4	1.4
MCA	1	1.8	1.8	1.8
NOTES	1,2,3	1,2,3,4	1,2,3,4	1,2,3,4

NOTES:
1. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION. DISCONNECT BY ELECTRICAL CONTRACTOR.
2. PROVIDE UNIT WITH INTEGRAL THERMOSTAT.
3. UNIT TO INCLUDE ALL MOUNTING BRACKETS. HARDWARE, ETC. FOR COMPLETE INSTALL.
4. MOUNT UNIT HEATER WHERE BOTTOM IS AT MINIMUM OF 12'-0" AFF, OR AS RECOMMENDED BY UNIT MFR.

PUMP SCHEDULE

REFERENCE	HWP-1,2	CHWP-1,2	CWP-1	HCP-1
MANUFACTURER	TACO	TACO	TACO	TACO
MODEL #	FI4009D	FI5011D	VT14LH	KV4009D
TYPE	END SUCTION	END SUCTION	VERTICAL TURBINE	INLINE
SERVES	BUILDING B HEATING	BUILDING B COOLING	BUILDING B CONDENSER WATER	AHU-2A HEATING COIL
WEIGHT (LBS)	655	835	1750	250
DIMENSIONS - L x W x H (INCHES)	40 X 18 X 27	52 X 18 X 29	14.5 X 14.5 X 174	22 X 13 X 28
FLOW RATE (GPM)	600	950	1,150	230
OPERATING PRESSURE (FT. HEAD)	70	70	90	25
IMPELLER DIAMETER (INCH)	9.00	9.40	10.56	7.85
IMPELLER DIAMETER RANGE (INCH)	6.75-9.5	8-11	9.5-11.29	6.75-9.5
PUMP EFFICIENCY %	84%	84%	82%	80%
ELECTRICAL DATA				
MOTOR HP	15	20	50	2
BHP	12.7	19.0	38.1	2.3
RPM	1,760	1,800	1,800	1,760
VOLTAGE - PH	480 - 3	480 - 3	480 - 3	480 - 3
NOTES	1,2,3,4,5	1,2,3,4,5	1,2,3,4,6	1,2,3,4

NOTES:
1. REFER TO CONTROL DRAWINGS.
2. TCC TO PROVIDE VFD'S WITH INTEGRAL DISCONNECT. VFD'S INSTALLED BY EC.
3. MOTORS TO BE SUITABLE FOR OPERATION WITH VARIABLE FREQUENCY DRIVE (VFD).
4. PROVIDE WITH SHAFT GROUNDING KITS.
5. BASE MOUNTED PUMP, PROVIDE INERTIA PAD.
6. VFD PROVIDED SHALL INCLUDE BYPASS FOR MANUAL OPERATION.

RADIANT CIRC PUMP SCHEDULE

REFERENCE	RCP-1
MANUFACTURER	TACO
MODEL #	009
SERVES	RADIANT FLOOR SYSTEM
GPM	2
TOTAL DEVELOPED HEAD (FT)	20'
HP	1/8
PUMP RPM	3,250
VOLT/PHASE	120/1
NOTES	1, 2, 3

NOTES:
1. E.C. TO PROVIDE DISCONNECT.
2. PUMP TO RUN TO MAINTAIN SPACE TEMP. REFER TO RADIANT MANIFOLD DETAILS.
3. COORDINATE WITH DDC CONTROLS. RADIANT HEAT TO BE FIRST STAGE OF HEATING FOR BREAK ROOM.

RADIANT FLOOR MANIFOLD SCHEDULE

REFERENCE	RF-1
MANUFACTURER	ROTH RADIANT
MODEL #	NP MANIFOLD SET
SERVES	BREAK ROOM
SUPPLY WATER TEMP (F)	130
TUBE SPACING	12"
TUBE SIZE (NOMINAL)	1/2"
LOAD (BTUH/S.F.)	30
APPROX. SQ. FT OF COVERAGE	600
TOTAL LOAD (BTUH)	30,000
AMBIENT ROOM TEMP (F)	68
FLOOR COVERING	CARPET
TOTAL MANIFOLD GPM	1.7
MINIMUM LOOPS REQUIRED	2
MAXIMUM LOOP LENGTH (FT)	300
MAXIMUM TUBE & MANIFOLD PRESS. DROP (FT)	15'
SYSTEM FLUID	WATER
NOTES	1

1. MFR TO PROVIDE OPEN/CLOSE TYPE CONTROL VALVE WITH MANIFOLD AND ZONE THERMOSTAT.

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Key Plan

Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
SCH Project No. 9429.00

Sheet Issue Date
BID DOCUMENTS 11/13/2025

Sheet Name
MECHANICAL SCHEDULES

Sheet Number
M502

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GENERAL NOTES:

A. REFER TO M000 FOR GENERAL NOTES & SYMBOLS.

B. REFER TO M300, M301, M302, M303 AND M304 FOR MECHANICAL DETAILS.

C. REFER TO M400 AND M401 FOR CONTROLS SEQUENCES AND DIAGRAMS.

D. REFER TO M500, M501 AND M502 FOR MECHANICAL SCHEDULES.

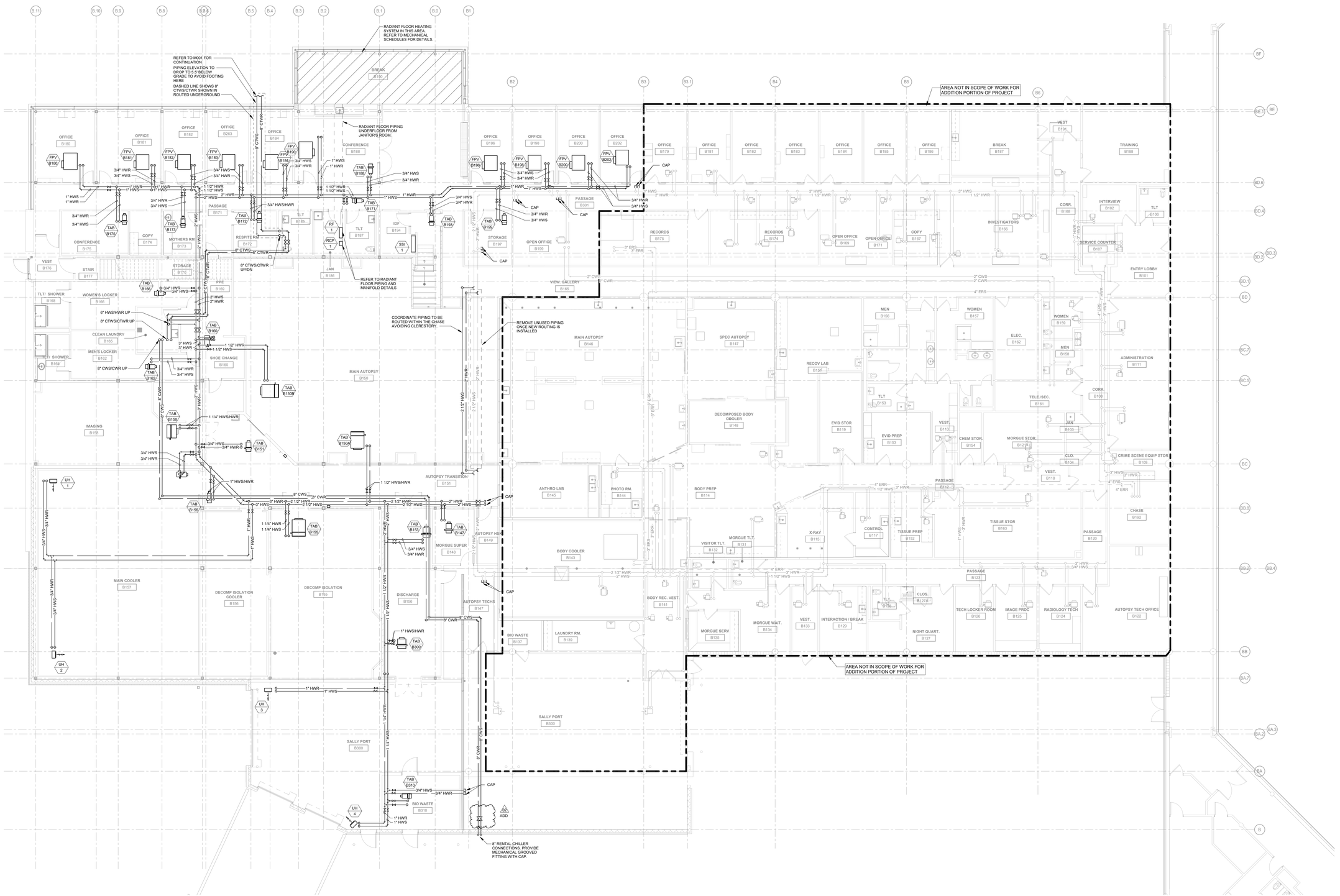
E. HEATING WATER BRANCH PIPING TO HEATING EQUIPMENT SHALL BE 3/4" UNLESS NOTED OTHERWISE.

F. COORDINATE PIPE ROUTING WITH DUCTWORK. DUCTWORK HAS PRIORITY OVER PRESSURE PIPING. ROUTE PIPING WITHIN JOIST SPACES WHERE POSSIBLE.

G. BRANCH PIPING SHALL BE TAKEN OFF THE TOP OF MAIN PIPING.

H. SIZE AND ROUTE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

I. ALL PIPING PENETRATIONS TO BE SEALED AIR TIGHT. REFER TO A003 FOR SPECIFIC WALL REQUIREMENTS.



1 PIPING PLAN - MAIN LEVEL - ADDITION
1/8" = 1'-0"

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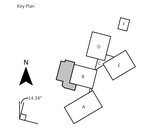
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. **23825001**
SOI Project No. **9429.00**

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

Sheet Name
PIPING MAIN LEVEL - ADDITION

Sheet Number
MH101A

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GENERAL NOTES:

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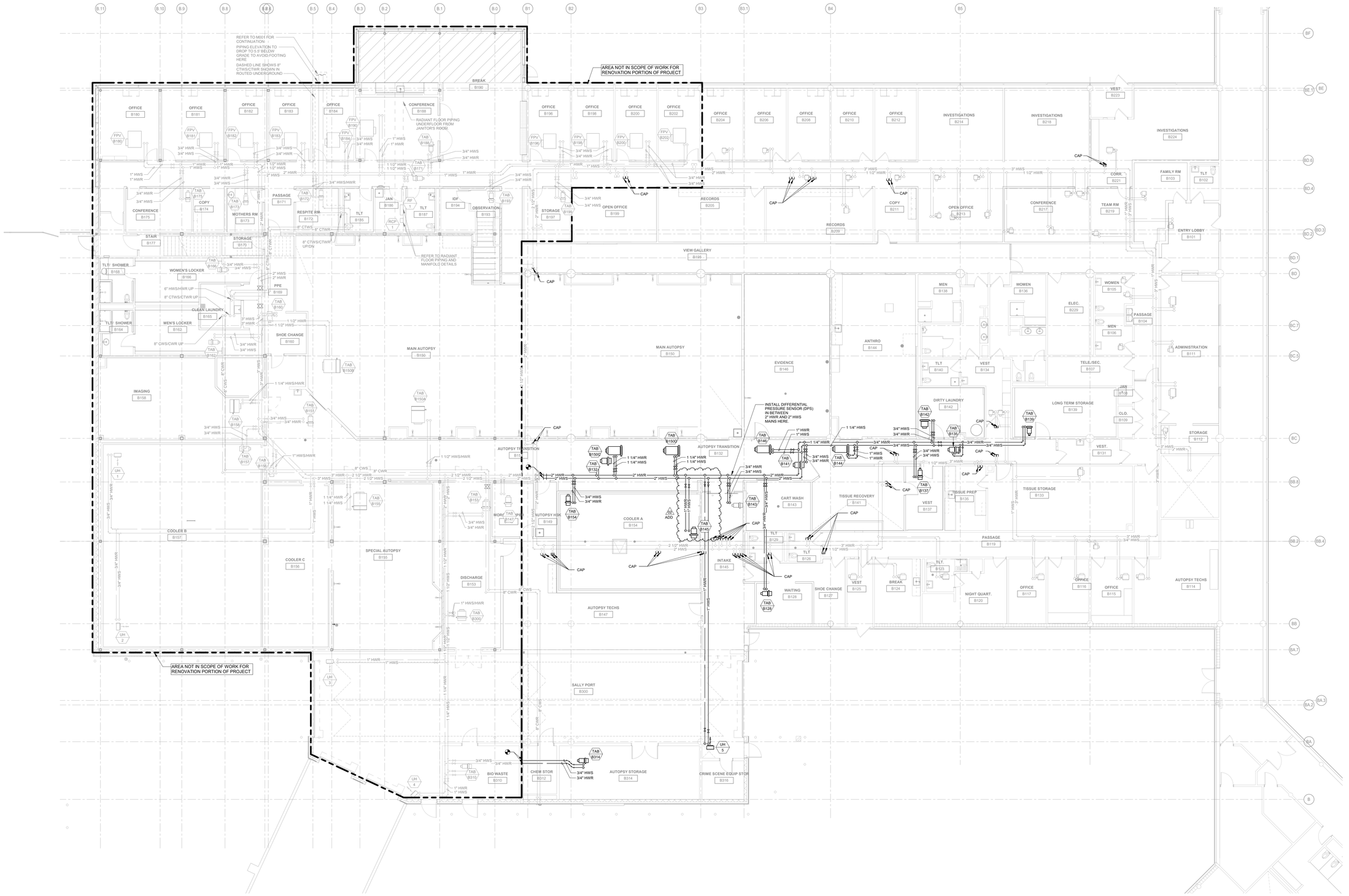

N 1 PIPING PLAN - MAIN LEVEL - RENOVATION
1/8" = 1'-0"

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Key Plan

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ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. 23825001
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Sheet Issue Date
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Sheet Name
PIPING MAIN LEVEL - RENOVATION

Sheet Number
MH101B

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GENERAL NOTES:

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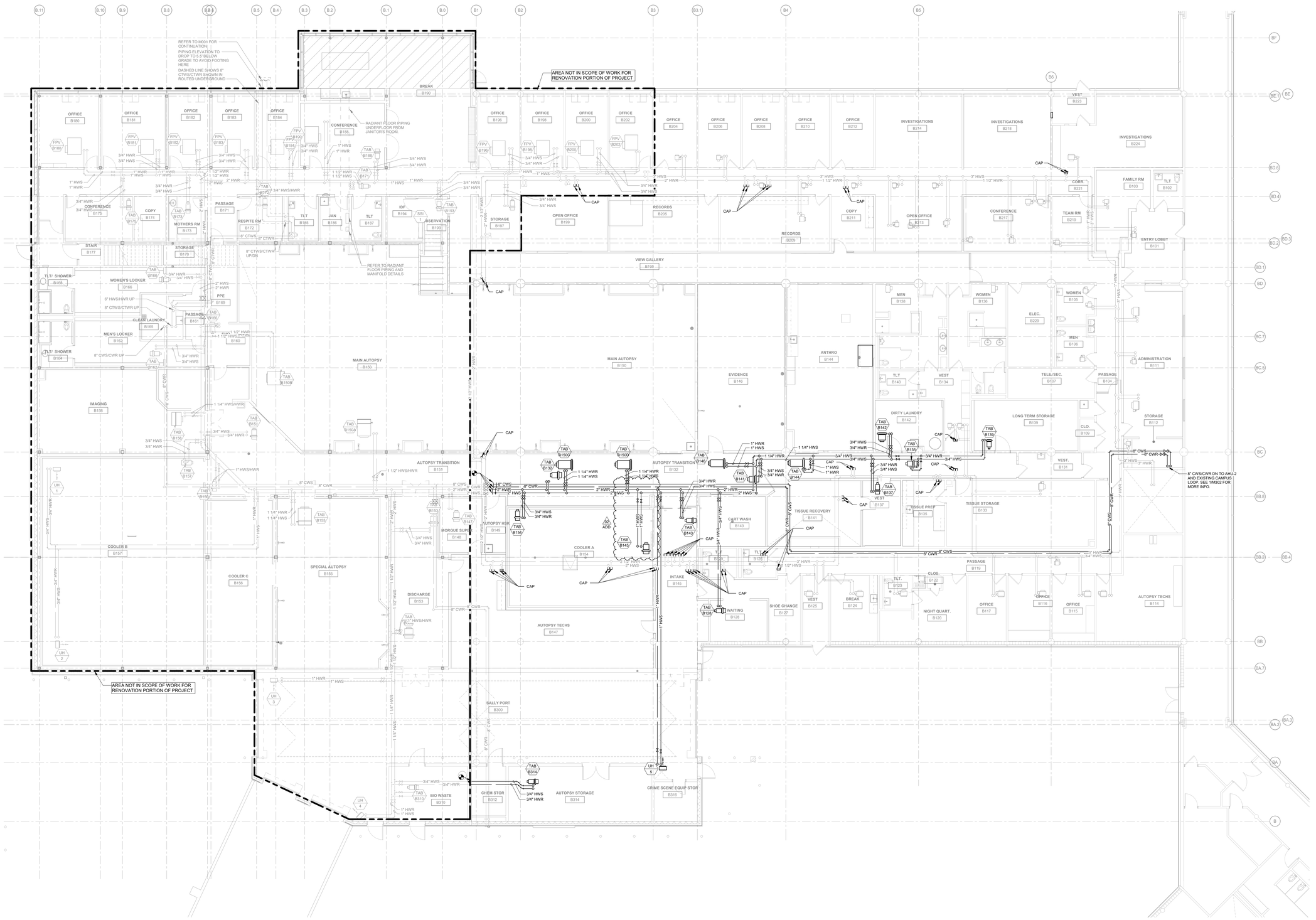
H. SIZE AND ROUTE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

I. ALL PIPING PENETRATIONS TO BE SEALED AIR TIGHT. REFER TO A003 FOR SPECIFIC WALL REQUIREMENTS.



N 1 PIPING PLAN - MAIN LEVEL - RENOVATION (ALT #3)
1/8" = 1'-0"

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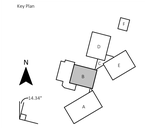
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

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BID DOCUMENTS 11/13/2025

Sheet Name
PIPING MAIN LEVEL - RENOVATION (ALTERNATE)

Sheet Number
MH101B(ALT)

PRINTED: 12/4/2025 2:06:41 PM

LIGHTING RELAY PANEL SCHEDULE

PANEL SPECIFICATION: BASIS OF DESIGN: WATTSTOPPER

DESCRIPTION: FOR EACH OF 3 LIGHTING RELAY PANELS: (16) 120-277V 16 AMP RATED INDIVIDUALLY PROGRAMMABLE RELAYS. 0-10V DIMMING CONTROL OF ASSOCIATED FIXTURES. NEMA 1 RATED RECESSED ENCLOSURE. INTEGRAL CONTROLLER WITH NUMERIC DISPLAY SUPPORTING ADDRESSABLE MODULE PROGRAMMING AND DIAGNOSTICS. PROVIDE WITH FACTORY INSTALLED RELAYS PER RELAY SCHEDULE BELOW. PROVIDE CONTROL CABLING AND ALL APPURTENANCES FOR COMPLETE INSTALLATIN OF LIGHTING CONTROLS SYSTEM. REFER TO LIGHTING CONTROLS SCHEDULE FOR ASSOCIATED SWITCHES AND OTHER CONTROL DEVICES.

NOTES:

1. PROVIDE UL 924 LISTED DEVICES FOR RELAYS AS NOTED.
2. ISOLATE EMERGENCY AND NON-EMERGENCY LIGHTING RELAYS WITH PHYSICAL BARRIER PER N.E.C.
3. COORDINATE SYSTEM SCHEDULE WITH OWNER. SYSTEM SHALL BE CAPABLE OF 7 DAY PROGRAMMING PER ENERGY CODE WITH UP TO 2 HOUR OVER-RIDE B...

RELA...	RELAY #	PANEL-CIRCUIT	VOLTAGE	LOCATION	CONTROL	RELAY TYPE
RP1	1	4B4-3	277V	BREAK ROOM ZONE 1	0-10V	
RP1	2	4B3-3	277V	BREAK ROOM ZONE 2	0-10V	
RP1	3	4B3-1	277V	W HALLS AND DISCHARGE	0-10V	
RP1	4	4B3-7	277V	SALLY PORT	0-10V	
RP1	5	E4B2-15	277V	WEST EXTERIOR	0-10V	UL-924
RP1	6	E4B2-3	277V	WEST INTERIOR EMERGENCY	0-10V	UL-924
RP1	7		277V	SPARE	0-10V	
RP1	8	-	277V	SPARE	0-10V	
RP1	9	-	277V	SPARE	0-10V	
RP1	10	-	277V	SPARE	0-10V	
RP1	11	-	277V	SPARE	0-10V	
RP1	12	-	277V	SPARE	0-10V	
RP1	13	-	277V	SPARE	0-10V	
RP1	14	-	277V	SPARE	0-10V	
RP1	15	-	277V	SPARE	0-10V	
RP1	16	-	277V	SPARE	0-10V	
RP2	1	4B3-5	277V	AUTOPSY	0-10V	
RP2	2	4B3-5	277V	AUTOPSY TABLE 1	0-10V	
RP2	3	4B3-5	277V	AUTOPSY TABLE 2	0-10V	
RP2	4	4B3-5	277V	AUTOPSY TABLE 3	0-10V	
RP2	5	4B3-5	277V	AUTOPSY TABLE 4	0-10V	
RP2	6	4B3-5	277V	AUTOPSY TABLE 5	0-10V	
RP2	7	4B3-9	277V	SPECIAL AUTOPSY	0-10V	
RP2	8	4B3-9	277V	SPECIAL AUTOPSY TABLE 1	0-10V	
RP2	9	4B3-9	277V	SPECIAL AUTOPSY TABLE 2	0-10V	
RP2	10	-	277V	SPARE	0-10V	
RP2	11	-	277V	SPARE	0-10V	
RP2	12	-	277V	SPARE	0-10V	
RP2	13	-	277V	SPARE	0-10V	
RP2	14	-	277V	SPARE	0-10V	
RP2	15	-	277V	SPARE	0-10V	
RP2	16	-	277V	SPARE	0-10V	
RP3	1	N4B1-5	277V	EAST HALLS	0-10V	
RP3	2	N4B1-17	277V	EAST AUTOPSY	0-10V	
RP3	3	N4B1-17	277V	EAST AUTOPSY TABLE 1	0-10V	
RP3	4	N4B1-17	277V	EAST AUTOPSY TABLE 2	0-10V	
RP3	5	N4B1-17	277V	EAST AUTOPSY TABLE 3	0-10V	
RP3	6	N4B1-17	277V	EAST AUTOPSY TABLE 4	0-10V	
RP3	7	N4B1-17	277V	EAST AUTOPSY TABLE 5	0-10V	
RP3	8	N4B1-18	277V	EVIDENCE	0-10V	
RP3	9	N4B1-18	277V	ANTHROPOLOGY	0-10V	
RP3	10	N4B1-18	277V	ANTHROPOLOGY TABLE	0-10V	
RP3	11	N4B1-6	277V	CART WASH	0-10V	
RP3	12	N4B1-6	277V	TISSUE RECOVERY	0-10V	
RP3	13	E4B1-10	277V	EAST EXTERIOR LIGHTING	0-10V	UL-924
RP3	14	E4B1-13	277V	EAST INTERIOR EMERGENCY	0-10V	UL-924
RP3	15	-	277V	SPARE	0-10V	
RP3	16	-	277V	SPARE	0-10V	

FLOORBOX SCHEDULE

SCHEDULE NOTES:

1. ALL FLOORBOXES SHALL BE UL OR SIMILARLY LISTED, AND SHALL MEET OR EXCEED UL SCRUB WATER EXCLUSION REQUIREMENTS.
2. REFER TO ARCHITECTURAL DOCUMENTS INCLUDING FLOOR FINISH PLANS, FURNITURE PLANS, AND STRUCTURAL PLANS FOR EXACT INSTALLATION LOCATION, DETAILS AND COORDINATION REQUIREMENTS. IF ARCHITECTURAL DRAWINGS DO NOT CLARIFY EXACT INSTALL LOCATION, AND ISSUE AN RFI FOR ARCHITECT TO SPECIFICALLY CLARIFY PRIOR TO BOX ROUGH-IN.
3. UNLESS OTHERWISE NOTED, ALL FLOOR BOXES SHALL BE INSTALLED PER MANUFACTURER INSTALLATION GUIDELINES WITH COVERPLATE FLUSH WITH FINISHED FLOOR. COORDINATE COVER SELECTION TYPE AND INSTALLATION ROUGH-IN REQUIREMENTS WITH ARCHITECTURAL FINISH AND GRADING PLANS.
4. REFER TO SYSTEMS DRAWINGS AND DETAILS FOR ADDITIONAL REQUIREMENTS REGARDING A/V CABLES,DEVICES, AND INSTALLATION.

TYPE	MANUFACTURER	MODEL	DESCRIPTION	FLOOR TYPE / BOX STYLE	DEVICE QUANTITIES: DUPLEX RECEPTACLES	DEVICE QUANTITIES: DATA JACKS	DEVICE QUANTITIES: A/V	APPROVED EQUALS
FB1	LEGRAND WIREMOLD	EFB45###	4 GANG RECESSED SQUARE FLOOR BOX. DIE CAST ALUMINUM POWDER COAT FINISH COVER PLATE. ARCHITECT TO SELECT BOX FINISH FROM MANUFACTURER STANDARD DURING SUBMITTAL PROCESS. CONFIGURABLE INTERNAL DEVICE MODULES. AUTO CLOSE CABLE MANAGEMENT EGRESS DOORS. MULTIPLE KNOCKOUTS OF VARYING SIZE, 3/4" -2". ACCEPTS STANDARD SINGLE GANG DEVICES. INCLUDE WITH ALL REQUIRED ACCESSORIES, FACEPLATES, AND APPURTENANCES FOR COMPLETE INSTALLATION OF DEVICES AS SCHEDULED.	WOOD, CONCRETE / RECESSED	4	2	-	HUBBELL, AS APPROVED BY ENGINEER.
FB3	LEGRAND WIREMOLD	4ATT###	4" ROUND 2 GANG RECESSED ROUND POKE-THROUGH FLOOR BOX. SEPARATE COMPARTMENTS FOR POWER AND DATA DEVICES. DIE CAST ALUMINUM POWDER COAT FINISH COVER PLATE. ARCHITECT TO SELECT BOX FINISH FROM MANUFACTURER STANDARD DURING SUBMITTAL PROCESS. CONFIGURABLE INTERNAL DEVICE MODULES. AUTO CLOSE CABLE MANAGEMENT EGRESS DOORS. MULTIPLE KNOCKOUTS OF VARYING SIZE, 3/4" -2", UL LISTED FOR 2-HOUR FIRE RATED FLOORS. INTEGRAL BELOW FLOOR JUNCTION BOX EXTENDING 18-1/2" BELOW FINISHED FLOOR. INCLUDE WITH ALL REQUIRED ACCESSORIES, FACEPLATES, AND APPURTENANCES FOR COMPLETE INSTALLATION OF DEVICES AS SCHEDULED.	WOOR, CONCRETE / POKE-THROUGH	1	4	-	HUBBELL, AS APPROVED BY ENGINEER.

LIGHTING CONTROLS SCHEDULE

NOTES:

1. PROVIDE LIGHTING CONTROLS AS A COMPLETE SYSTEM AND INCLUDE MATERIAL AND INSTALLATION FOR ALL POWER PACKS, ACCESSORIES, CONTROLLERS, AND WIRING REQUIRED FOR OPERATION.
2. ALL DEVICES SHALL BE U.L. OR SIMILARLY LISTED.
3. ALL DEVICES PROVIDED WITH MANUFACTURER LIMITED 5 YEAR WARRANTY.
4. PROVIDE LIGHTING CONTROLS WITH MANUFACTURER COMPLIANT POWER PACKS AND LOW VOLTAGE ROOM CONTROLLERS IN QUANTITY REQUIRED TO INSTALL A COMPLETE AND OPERATIONAL SYSTEM. MANUFACTURER OR MANUFACTURERS REP TO PROVIDE DEVICE QUANTITIES, LAYOUTS AND TYPICAL WIRING DETAILS DURING SHOP SUBMITTAL PROCESS. PROVIDE DIMMING COMPATIBLE DEVICES WHERE DIMMING CONTROLS ARE SHOWN. COORDINATE DIMMING TYPE WITH LIGHTING FIXTURES SHOWN. REFER TO LUMINAIRE SCHEDULE FOR FIXTURE DIMMING TYPE.
5. WHERE WIRELESS LIGHTING CONTROLS ARE PROVIDED. POWERPACKS SHALL BE PROVIDED AND INSTALLED WITHIN MANUFACTURER RECOMENDED DISTANCES TO ENSURE CONTROLLER OPERATION.
6. INSTALL LOW VOLTAGE POWER PACKS AND ROOM CONTROLLERS ABOVE NEARBY ACCESSIBLE CEILING TILES OR IN NEARBY ACCESSIBLE CLOSET/STORAGE SPACES ADJACENT TO CONTROLLED FIXTURES. DO NOT INSTALL POWERPACKS EXPOSED IN COMMON SPACES OR IN INACCESSIBLE LOCATIONS.
7. PROVIDE FACTORY AUTHORIZED REPRESENTATIVE TO DEMONSTRATE TYPICAL INSTALLATION AND COMMISSIONING OF EQUIPMENT.
8. WHERE APPROVED EQUAL MANUFACTURER PRODUCTS SENSOR COVERAGE OR LOAD RATINGS DIFFER FROM BASIS OF DESIGN, CONTRACTOR AND MANUFACTURER ARE RESPONSIBLE FOR PROVIDING ADDITIONAL DEVICES AS NECCESARY TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
9. ETD'S AND ALL EMERGENCY LIGHTING CONTROLS COMPONENTS SHALL BE TESTED AND LISTED AS COMPATIBLE BY MANUFACTURER WITH NORMAL LIGHTING CONTROLS IN ALL AREAS.
10. UNLESS INDICATED OTHERWISE, LIGHTING CONTROL SCHEMES/OPERATION SHALL BE AS FOLLOWS:

CORRIDORS, VESTIBULES, COMMON SPACES:	SENSORS PROGRAMMED FOR OCCUPANCY MODE, AUTOMATIC ON/OFF OPERATION, 20 MINUTES MINNIMUM, 30 MINUTES MAXIMUM. DIMMING CONTROL OF FIXTURES WITHIN DAYLIGHT ZONES SHALL BE BY ALWAYS ON DAYLIGHT SENSOR.
ALL OTHER SPACES	SENSORS PROGRAMMED FOR VACANCY MODE, MANUAL ON/AUTOMATIC OFF OPERATION 20 MINUTES MINNIMUM, 30 MINUTES MAXIMUM.DIMMING CONTROL OF FIXTURES WITHIN DAYLIGHT ZONES SHALL BE BY ALWAYS ON DAYLIGHT SENSOR.

DESIGNED BY: EDH

TYPE	DESCRIPTION	ELECTRICAL	MOUNTING	SENSOR TYPE	COVERAGE	APPROVED MANUFACTURERS
PC	LINE VOLTAGE EXTERIOR PHOTOCELL. WET LOCATION LISTED. ADJUSTABLE SWIVEL MOUNTING. FAIL-ON OPERATION. UNIVERSAL 120-277V RATED, 1800VA RATED.	120/277V	WALL	N/A	N/A	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, GREENGATE, LEVITON, LUTRON, INTERMATIC, PRECISION MULTIPLE CONTROLS, AS APPROVED BY ENGINEER.
S1a	SINGLE ZONE CONTROL LIGHT SWITCH. DIMMING LIGHTING CONTROL, LIGHTING CONTROLS NETWORK COMPATIBLE DEVICE. ROOM CONTROLLER COMPATIBLE, ENABLING MULTI-ZONE SWITCHING CONTROL AND MULTI-SOURCE DIMMING. PROVIDED WITH MANUFACTURER DECORATIVE WALLPLATE. DEVICE FINISH MATCHING WIRING DEVICES SPEC.	LOW VOLTAGE	WALL SWITCH / SINGLE GANG	N/A	N/A	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, AS APPROVED BY ENGINEER.
S1b	REFER TO DETAIL 9/E501 FOR SPECIFICATIONS OF CUSTOM LIGHTING CONTROL STATION.	LOW VOLTAGE	WALL SWITCH / SINGLE GANG	N/A	N/A	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, AS APPROVED BY ENGINEER.
S1c	REFER TO DETAIL 10/E501 FOR SPECIFICATIONS OF CUSTOM LIGHTING CONTROL STATION.	LOW VOLTAGE	WALL SWITCH / SINGLE GANG	N/A	N/A	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, AS APPROVED BY ENGINEER.
S2a	TWO ZONE CONTROL LIGHT SWITCH. DIMMING LIGHTING CONTROL, LIGHTING CONTROLS NETWORK COMPATIBLE DEVICE. ROOM CONTROLLER COMPATIBLE, ENABLING MULTI-ZONE SWITCHING CONTROL AND MULTI-SOURCE DIMMING. PROVIDED WITH MANUFACTURER DECORATIVE WALLPLATE. DEVICE FINISH MATCHING WIRING DEVICES SPEC.	LOW VOLTAGE	WALL SWITCH / SINGLE GANG	N/A	N/A	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, AS APPROVED BY ENGINEER.
S5	EIGHT BUTTON MANUAL ON/OFF, UP DOWN DIMMING LIGHT SWITCH. FOUR PROGRAMMABLE LIGHTING SCENE SELECTION BUTTONS. LIGHTING CONTROLS NETWORK COMPATIBLE DEVICE. ROOM CONTROLLER COMPATIBLE, ENABLING MULTI-ZONE SWITCHING CONTROL AND MULTI-SOURCE DIMMING. PROVIDED WITH MANUFACTURER DECORATIVE WALLPLATE. DEVICE FINISH MATCHING WIRING DEVICES SPEC.	LOW VOLTAGE	WALL SWITCH / SINGLE GANG	N/A	N/A	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, AS APPROVED BY ENGINEER.
D y1	CONTINUOUS DIMMING 0-10V CONTROL PHOTOCELL. 0-500 FC LIGHT SENSITIVITY WITH ADJUSTABLE THRESHOLD. ADJUSTABLE DIMMING TIME DELAY.	LOW VOLTAGE / 0-10V	CEILING	CLOSED LOOP	N/A	HUBBELL, WATTSTOPPER, LEVITON, AS APPROVED BY ENGINEER
ETD 1	AUTOMATIC EMERGENCY LIGHTING POWER TRANSFER DEVICE. INTEGRAL TEST SWITCH. NON-DIMMING. UNIVERSAL 120/277V, 16A RATED RELAY INTERLOCKED TO PREVENT CROSS CONNECTION OF EMERGENCY AND NORMAL POWER. FLUSH MOUNTED 4-1/11/6" BACK BOX COMPATIBLE DEVICE.	120/277V	SURFACE	N/A	N/A	LEVITON, GREENGATE, CRESTRON, HUBBELL, AS APPROVED BY ENGINEER.
ETD 2	AUTOMATIC EMERGENCY LIGHTING POWER TRANSFER DEVICE. INTEGRAL TEST SWITCH. 0-10V DIMMING PASSTHROUGH. UNIVERSAL 120/277V, 16A RATED RELAY INTERLOCKED TO PREVENT CROSS CONNECTION OF EMERGENCY AND NORMAL POWER. FLUSH MOUNTED 4-11/16" BACK BOX COMPATIBLE DEVICE.	120/277V / 0-10V DIMMING	SURFACE	N/A	N/A	LEVITON, GREENGATE, CRESTRON, HUBBELL, AS APPROVED BY ENGINEER.
OS 2	CEILING MOUNTED OCCUPANCY/VACANCY SENSOR. WHITE FINISH. AUTOMATIC SELF-ADAPTIVE COVERAGE THRESHOLD AND FALSE ON/FALSE OFF CORRECTION. 8-30 MINUTE TIMER SETTINGS. INDOOR USE.	LOW VOLTAGE	CEILING / 8'-12' MH	DUAL-TECH	1000 SQ FT / 360 DEG	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, GREENGATE, AS APPROVED BY ENGINEER.
OS y4A	CEILING MOUNTED OCCUPANCY/VACANCY SENSOR. WHITE FINISH. AUTOMATIC SELF-ADAPTIVE COVERAGE THRESHOLD AND FALSE ON/FALSE OFF CORRECTION. 8-30 MINUTE TIMER SETTINGS. INDOOR USE.	LOW VOLTAGE	CEILING / 8'-12' MH	ULTRASONIC	1000 SQ FT / 360 DEG	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, GREENGATE, AS APPROVED BY ENGINEER.
OS z1	WALL SWITCH OCCUPANCY SENSOR. DEVICE FINISH MATCHING WIRING DEVICES SPEC. RATED FOR MIN 1/6 HP MOTOR. INTEGRAL AUTOMATIC SELF-ADAPTIVE COVERAGE THRESHOLD AND FALSE ON/FALSE OFF CORRECTION. 8-30 MINUTE TIMER SETTINGS.	120V	WALL SWITCH / SINGLE GANG	DUAL-TECH	1000 SQ FT / 180 DEG	HUBBELL, CRESTRON, ACUITY, WATTSTOPPER, GREENGATE, AS APPROVED BY ENGINEER.
OS z2	WALL SWITCH OCCUPANCY SENSOR. DEVICE FINISH MATCHING WIRING DEVICES SPEC. RATED FOR MIN 1/6 HP MOTOR. INTEGRAL AUTOMATIC SELF-ADAPTIVE COVERAGE THRESHOLD AND FALSE ON/FALSE OFF CORRECTION. 8-30 MINUTE TIMER SETTINGS.	120V / 0-10V DIMMING	WALL SWITCH / SINGLE GANG	DUAL-TECH	1000 SQ FT / 180 DEG	HUBBELL, CRESTRON, ACUITY, GREENGATE, AS APPROVED BY ENGINEER.

LIGHTING FIXTURE SCHEDULE

NOTES:

1. ALL FIXTURES SHALL BE U.L. OR SIMILARLY LISTED.
2. INCLUDE A MINIMUM 1 YEAR WARRANTY FOR LIGHTING FIXTURES, WHERE NOT OTHERWISE SPECIFIED.
3. REFER TO ARCHITECTURAL DOCUMENTS FOR EXACT MOUNTING LOCATIONS, DETAILS, AND CONFIGURATIONS OF ALL LUMINAIRES. IF ARCHITECTURAL DRAWINGS DO NOT CLARIFY EXACT MOUNTING LOCATION OR DETAIL, ISSUE AN RFI FOR ARCHITECT TO SPECIFICALLY CLARIFY PRIOR TO FIXTURE ROUGH-IN.
4. VERIFY COMPATIBILITY OF LIGHT FIXTURES WITH ARCHITECTURAEAL CEILING PLAN, MATERIALS, ADJACENT CONSTRUCTION, AND ADJACENT FINISHES PRIOR TO SHOP DRAWINGS SUBMITTAL. ADJUST FIXTURE TYPE, CONSTRUCTION, FLANGE,...
5. CONTRACTOR IS RESPONSIBLE FOR ALL MISCELLANEOUS HARDWARE NECESSARY TO INSTALL AND SUPPORT THE LUMINAIRES.
6. AIM AND TARGET ADJUSTABLE INTERIOR AND EXTERIOR LIGHT FIXTURES UNDER THE OBSERVATION AND IN COMPLIANCE WITH RECOMMENDATIONS OF THE ARCHITECT. INCLUDE LABOR AND MATERIAL COSTS MADE NECESSARY BY THIS REQUIREMENT.
7. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND FILLING OUT ALL UTILITY REBATE FORMS FOR OWNER.

DESIGNED BY: BTC

TYPE	MANUFACTURER	MODEL	DESCRIPTION	FINISH	LUMENS	CRI	SOURCE-CCT	VOLTAGE	LOAD-VA	APPROVED EQUALS
E1	HUBBELL DUAL-LITE	LZ-2-I-03L	EMERGENCY LIGHT, WALL OR CEILING MOUNTED, THERMOPLASTIC HOUSING, 2 LED ADJUSTABLE LAMP HEADS, LEAD-CALCIUM MAINTENANCE FREE BATTERY, SELF-DIAGNOSTICS	WHITE	N/A	N/A	LED	277 V	2 VA	SURE-LITES, LIGHTALARMS, EVENLITE, EMERGENSEE, AS APPROVED BY ENGINEER.
F1	FAILSAFE	QS-CLMG-24-4-INS-A1212 5-LD4-3-STD-50-UNV-ED1 D_-1	2X4 CLEANROOM RECESSED TROFFER, AUTOPSY LIGHTING, STEEL FRAMING, HIGH R9 VALUE, 0-10V DIMMING TO 1%.	WHITE	20000	90	LED - 5000K	277 V	40 VA	LIFESHIELD, NEWSTAR, AS APPROVED BY ENGINEER
F2	FAILSAFE	QS-CLMG-14-4-INS-A1212 5-LD4-3-LO-50-UNV-ED1D _-1	1X4 CLEAN ROOM RECESSED TROFFER, AUTOPSY SUITE FIXTURE, STEEL FRAMING, HIGH R9 VALUE, 0-10V DIMMING TO 1%.	WHITE	11000	90	LED - 5000K	277 V	40 VA	LIFESHIELD, NEWSTAR, AS APPROVED BY ENGINEER
F3	NEWSTAR	AAOM-G-14-HA16-L2-50-1 C-RW-UN	1X4 RECESSED TROFFER, MRI FIXTURE, NON-FERROUS CONSTRUCTION, HIGH R9 VALUE, REMOTE DRIVER, 0-10V DIMMING TO 1%.	WHITE	6000	90	LED - 4000K	120 V	48 VA	KENALL, AS APPROVED BY ENGINEER
F4	FAILSAFE	QS-CLMG-24-4-INS-A1212 5-LD4-3-LO-50-UNV-ED1D _-1	2X4 RECESSED TROFFER, MULTI-USE MEDICAL FIXTURE, HIGH R9 VALUE, 0-10V DIMMING TO 1%.	WHITE	9000	90	LED - 5000K	277 V	40 VA	LIFESHIELD, NEWSTAR, AS APPROVED BY ENGINEER
F5A	METALUX	24CGT4550C	2X4 BACKLIT FLAT PANEL, STEEL HOUSING, 0-10V DIMMING, WHITE FINISH, 5 YEAR WARRANTY.	WHITE	4500	80	LED - 5000K	277 V	38 VA	LITHONIA, COLUMBIA, MAXLITE, AS APPROVED BY ENGINEER
F5B	METALUX	22CGT3550C	2X2 BACKLIT FLAT PANEL, STEEL HOUSING, 0-10V DIMMING, WHITE FINISH, 5 YEAR WARRANTY.	WHITE	3500	80	LED - 5000K	277 V	32 VA	LITHONIA, COLUMBIA, MAXLITE, AS APPROVED BY ENGINEER
F6	WAC LIGHTING	WS-180137-30K-1150-BN	4"X 37" VANITY, FLAT GLASS, SEMI-RECESSED APPEARANCE, ACRYLIC, INSTALLS OVER 3" OR 4" JUNCTION BOX.	WHITE	1600	90	LED - 3000K	277 V	21 VA	ALVA, ASL, MODERN FORMS, AS APPROVED BY ENGINEER
F7	ALPHABET	NU6-RD-SW-15LM-40K-90-35D-CL-WH-WH-UNV-DIM10	6" ROUND RECESSED DOWNLIGHT, MEDIUM DISTRIBUTION, CLEAR LENS, 0-10V DIMMING TO 1%, WHITE BEZEL, WHITE TRIM.	WHITE	1500	90	LED - 4000K	277 V	20 VA	ELCO, LUMENWERX, GOTHAM, AS APPROVED BY ENGINEER
F8A	FOCAL POINT	FSM2LS-FL-625LF-940K-D1-C24-WH	2" X 12' LINEAR PENDANT, FLUSH SATIN LENS, DIRECT/INDIRECT DISTRIBUTION, 625LMFT DOWN AND 375LMFT UP, 24" CABLE SUSPENSION, 0-10V DIMMING TO 10%, , CUSTOM COLOR TO BE TITANIUM SILVER BY FOCAL POINT.	TITANIUM SILVER	2500	90	LED - 4000K	277 V	48 VA	AXIS, LUMENWERX, STARFIRE, AS APPROVED BY ENGINEER
F8C	FOCAL POINT	FSM2LS-FL-625LF-940K-L-D1-C24-WH	SIMILAR TO F8A BUT 8' LENGTH	TITANIUM SILVER	2500	90	LED - 4000K	277 V	48 VA	AXIS, LUMENWERX, STARFIRE, AS APPROVED BY ENGINEER
F8D	FOCAL POINT	FSM2LS-FL-625LF-940K-L-D1-C24-WH	SIMILAR TO F8A BUT 12' LENGTH	TITANIUM SILVER	2500	90	LED - 4000K	277 V	48 VA	AXIS, LUMENWERX, STARFIRE, AS APPROVED BY ENGINEER
F9	FOCAL POINT	FSM2BS-ASFL-8WFL-62C-DN-3TSLP-940K-UNV-L1-C24-TS-12'	2" X 12' LINEAR PENDANT, FLUSH SATIN LENS, DIRECT/INDIRECT DISTRIBUTION, 625LMFT DOWN AND 375LMFT UP, 24" CABLE SUSPENSION, 0-10V DIMMING TO 10%, , CUSTOM COLOR TO BE TITANIUM SILVER BY FOCAL POINT.	TITANIUM SILVER	7500	90	LED - 4000K	277 V	48 VA	AXIS, LUMENWERX, STARFIRE AS APPROVED BY ENGINEER
F10A	PRUDENTIAL LTG.	BPRO2-PER-FLSH-LED4-4-0-LO-R13-TMW-WGZ-WTW-SC-UNV-X1-DM01	2" SPECIFIER PERIMETER WALL GRAZE FIXTURE, 4A FOOT ROW LENGTH, TEXTURED MATTE WHITE FINISH, T-BAR CEILING MOUNT, 0-10V DIMMING TO 1%.	WHITE	5800	90	LED - 4000K	277 V	42 VA	FOCAL POINT, AXIS, AS APPROVED BY ENGINEER
F10B	PRUDENTIAL LTG.	BPRO2-PER-FLSH-LED4-4-0-LO-R11-TMW-WGZ-WTW-SC-UNV-X1-DM01	2" APERTURE PERIMETER WALL GRAZE FIXTURE, 11 FOOT ROW LENGTH, TEXTURED MATTE WHITE FINISH, T-BAR CEILING MOUNT, 0-10V DIMMING TO 1%.	WHITE	4950	90	LED - 4000K	277 V	30 VA	FOCAL POINT, AXIS, AS APPROVED BY ENGINEER
F10C	PRUDENTIAL LTG.	BPRO2-PER-FLSH-LED4-4-0-LO-R11-TMW-WGZ-WTW-SC-UNV-X1-DM01	2" APERTURE PERIMETER WALL GRAZE FIXTURE, 10 FOOT ROW LENGTH, TEXTURED MATTE WHITE FINISH, T-BAR CEILING MOUNT, 0-10V DIMMING TO 1%.	WHITE	4500	90	LED - 4000K	277 V	30 VA	FOCAL POINT, AXIS, AS APPROVED BY ENGINEER
F11A	METALUX	8TSINX-62SL-LW-UNV-L94 0-CD-1-AYC-CHAIN/SET-U	8' UTILITY STRIP FIXTURE, CHAIN HUNG, FROSTED LENS, 0-10V DIMMING.	WHITE	7000	90	LED - 4000K	277 V	80 VA	COLUMBIA, MAXLITE, LITHONIA, AS APPROVED BY ENGINEER
F11B	METALUX	4SNX-41SL-LW-UNV-L940-1	4 UTILITY STRIP FIXTURE, CHAIN HUNG, FROSTED LENS.	WHITE	4000	90	LED - 4000K	277 V	20 VA	COLUMBIA, MAXLITE, LITHONIA, AS APPROVED BY ENGINEER
F11C	METALUX	4SNX-31SL-LW-UNV-L940-1	4' UTILITY STRIP FIXTURE, SURFACE MOUNT, FROSTED LENS, 0-10V DIMMING.	WHITE	2000	90	LED - 4000K	277 V	20 VA	COLUMBIA, MAXLITE, LITHONIA, AS APPROVED BY ENGINEER
F11D	METALUX	2SNX-23SL-LW-UNV-L940-1	2' UTILITY STRIP FIXTURE, CHAIN HUNG, FROSTED LENS.	WHITE	1500	90	LED - 4000K	277 V	20 VA	COLUMBIA, MAXLITE, LITHONIA, AS APPROVED BY ENGINEER
F12	METALUX	4LBLED-LD4-8-SYMF-UNV-L840-CD-1	4' LINEAR LOW-BAY PENDANT, FROSTED LENS, CHAIN HUNG, 0-10V DIMMING TO 10%.	WHITE	8000	90	LED - 4000K	277 V	20 VA	LITHONIA, LIRON, COLUMBIA, AS APPROVED BY ENGINEER
F13	LITHONIA	CSVT-L4R-5000LM-MVOLT -40K-80CRI	4' GASKETED SURFACE MOUNTED STRIP FIXTURE, WASH DOWN.	WHITE	5000	90	LED - 4000K	277 V	20 VA	COOPER, CURRENT, MAXLITE, AS APPROVED BY ENGINEER
F14	PRUDENTIAL LTG.	BPRO4-PER-REG1-LED4-4-0-LO-XX-TMW-PFL-WTW-SC-UNV-X1-DM01	4" APERTURE PERIMETER ROOM FILL FIXTURE, TEXTURED MATTE WHITE FINISH, T-BAR CEILING MOUNT, 0-10V DIMMING TO 1%, LENGTH TO BE FIELD VERIFIED WITH WALL TO WALL INSTALLATION TO MATCH EXISTING OPENING.	WHITE	485/FT	80	LED - 4000K	277 V	35 VA	AXIS, LUX LUMINAIRE, AS APPROVED BY ENGINEER
F15	FOCAL POINT	FSM2L-FL-625LF-940K-1C-UNV-L11-G1-WH-6FT	2" APERTURE RECESSED LINEAR FIXTURE, FLUSH LENS, 0-10V DIMMING TO 1%.	WHITE	625	90	LED - 4000K	277 V	40 VA	AXIS, LUMENWERX, STARFIRE, AS APPROVED BY ENGINEER
F16	ILP	HZV4-SL-U-40-SAFL-SS	4' HAZARDOUS LOCATION LINEAR VAPOR TIGHT	WHITE	5000	80	LED - 4000K	277 V	20 VA	MAXLITE, AVAIL, LDPI, AS APPROVED BY ENGINEER
F17	KENALL	MRIDL4-R-DCFW-13L-40K 9-CSS-24V-DIM1	6" ROUND RECESSED DOWNLIGHT, NON-FERROUS CONSTRUCTION, REGRESSED LENS, CLEAR SEMI-SPECULAR LENS.	WHITE	1000	90	LED - 4000K	120 V	20 VA	KIRLIN, HE WILLIAMS, PROLITE, AS APPROVED BY ENGINEER
F18	LITHONIA	WL4-20L-EZ1-LP840	4' SURFACE MOUNTED FIXTURE, LINEAR FACETED REFRACTOR, 0-10V DIMMING TO 1%, 5 YEAR WARRANTY.	WHITE	2000	80	LED - 4000K	277 V	24 VA	HE WILLIAMS, MAXLITE AS APPROVED BY ENGINEER
F19	GOTHAM	IVO4CYL-PC-D-20LM-40K-90CRI-40D-MIN10-MVOLT-Z7-LS-JBX-P-AR-LSS-DBL	4" PENDENT FIXTURE - CYLINDER, PARABOLIC REFLECTOR, SEMI SPECULAR TRIM, MATT BLACK FINISH, DRIVER INTEGRAL TO HEAD OF FIXTURE, 0-10V DIMMING TO 10%.	BLACK	2000	90	LED - 4000K	277 V	21 VA	ETLHAND, PORTFOLIO, PRESCOLITE, AS APPROVED BY ENGINEER
F20	BLACKJACK	SP-LGD-MU-02	DECORATIVE MUSHROOM PENDANT FIXTURE.	BLACK	700	80	LED	277 V	30 VA	SEE ALLOWANCE IN DESCRIPTION
F21	LUX LUMINAIRE	EOS 2.0in-WMM-I-ASY-375-XXX-WCT-9-UNV-LDE1-W	2.25" MULLION MOUNT PERIMETER FIXTURE. ASYMMETRIC ROOM SIDE DISTRIBUTION, WHITE COLOR TUNING, FADE TO BLACK DIMMING.	WHITE	375/FT	90	LED	277 V	30 VA	AS APPROVED BY ENGINEER
F22A	LITHONIA	UPLD-22IN-SWW4-90CRI-WH	22 IN UNDERCABINET FIXTURE, LED SWITCHABLE WHITE, COORDINATE CORD ROUTING WITH ARCHITECTUAL CASEWORK.	WHITE	1000	80	LED - 4000K	277 V	24 VA	COLUMBIA, LA LIGHTING, AS APPROVED BY ENGINEER
F22B	KIRLIN	MUL-01SWM-2FT-DD-40K	24 INCH UNDERCABINET FIXTURE, NON-FERROUS LED SWITCHABLE WHITE, COORDINATE CORD ROUTING WITH ARCHITECTUAL CASEWORK.	WHITE	1000	80	LED - 4000K	120 V	24 VA	COLUMBIA, LA LIGHTING, AS APPROVED BY ENGINEER
F23	FOCAL POINT	FSM4L-FL-625LF-940K-1C-UNV-L11-TF-WH	4" APERTURE RECESSED LINEAR FIXTURE, RECESSED IN SIDE OF BULK HEAD. PROVIDE WITH FLANGE KIT. FIXTURE TO BE CENTERED ALONG FACE OF BULK HEAD, 0-10V DIMMING TO 1%.	WHITE	2500	90	LED - 4000K	277 V	24 VA	STARFIRE, AS APPROV

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CLOCK SYSTEMS NOTES

1. COORDINATE CLOCK INSTALLATION WITH ARCHITECTURAL PLANS AND ELEVATIONS.
2. COORDINATE ALL CLOCK LOCATIONS CLOSELY WITH THE ELECTRICAL CONTRACTOR FOR BACKBOX AND POWER PURPOSES.

GROUNDING & BONDING NOTES

1. INSTALLATION OF THE COMMUNICATIONS GROUNDING AND BONDING SYSTEM SHALL BE COMPLIANT WITH TIA-607-D. REFER TO SPECIFICATION 27 05 26 FOR ADDITIONAL INFORMATION.
2. ENSURE THE MAIN BUILDING AC GROUND IS THOROUGHLY EXAMINED PRIOR TO INSTALLING THE TELECOMMUNICATIONS BONDING CONDUCTOR (TBC) TO THE PRIMARY BONDING BUSBAR (PBB).
3. THE TBC SHALL NOT EXCEED 30 FEET AND SHALL BE EQUAL IN SIZE (GAUGE) TO THE LARGEST TELECOMMUNICATIONS BONDING BACKBONE (TBB) CONDUCTOR. CONTRACTOR IS ENCOURAGED TO INSTALL THE PRIMARY BONDING BACKBONE (PBB) INSIDE THE MAIN ELECTRICAL ROOM TO KEEP TBC DISTANCES SHORT.
4. APPLY ANTI-CORROSION/OXIDATION COMPOUND TO THE LUG AND LUG SURFACE OF EACH TELECOMMUNICATIONS BUSBAR.

AUDIO VISUAL NOTES

1. ALL SUPPORTING DOCUMENTATION, PROGRAMMING, UNCOMPILED SOURCE CODE, GRAPHIC FILES, DSP CODE AND DIAGRAMS, WRITTEN AND ELECTRONIC FILES, INCLUDING ALL LATEST VERSIONS OF THE DOCUMENTATION AND SOFTWARE NECESSARY TO EDIT AND ADAPT THE SYSTEM(S), SHALL BE PROVIDED TO THE OWNER FOR ALL SPACES AND ALL SYSTEMS. THE INTEGRATOR AND/OR PROGRAMMER SHALL ALSO MAINTAIN A CURRENT COPY TO BE PROVIDED AT THE OWNER'S REQUEST.
   a. THE OWNER SHALL HAVE THE RIGHT TO MODIFY THIS CONTENT DIRECTLY OR TO HAVE IT MODIFIED BY ANY PARTY OF THE OWNER'S CHOOSING.
2. IN ADDITION TO THE INSTALLATION AND REQUIRED TECHNICIAN PROGRAMMING TIME, CONTRACTOR SHALL ACCOMMODATE THE FOLLOWING TIME REQUIREMENTS AT A MINIMUM:
   a. PRE-PROGRAMMING MEETING: EXPLAIN SYSTEM CAPABILITIES TO COORDINATE WITH STAFF'S NEEDS. (2 HOURS)
   b. POST-PROGRAMMING MEETING: WALK THROUGH TOUCHSCREEN AND ANY MOBILE APPLICATION LAYOUT. (2 HOURS)
   c. DEMONSTRATION AND COMPLETE END USER TRAINING. (2 HOURS)
3. AUDIO VISUAL SYSTEMS IN CONFERENCE B175, CONFERENCE B188 AND CONFERENCE B217 WILL BE PROVIDED BY OWNER'S VENDOR, CONFERENCE TECHNOLOGIES. ROUGH-IN AND PATHWAYS SHALL BE PROVIDED.
4. REFER TO AV DETAILS FOR AUTOPSY REQUIREMENTS AS WELL AS OTHER MISCELLANEOUS DISPLAYS THROUGHOUT THE FACILITY.

COMMUNICATIONS DEMOLITION NOTES

1. ALL EXISTING DEVICES AND DEVICE LOCATIONS WERE MADE BY CASUAL FIELD OBSERVATION. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING SYSTEM COMPONENTS AND DEVICE LOCATIONS.
2. PROVIDE LABOR AND MATERIALS TO REMOVE ELECTRICAL FACILITIES AND CLEAR THE AREA TO RECEIVE THE NEW WORK TO BE PROVIDED UNDER THIS CONTRACT.
3. SYSTEMS SCHEDULED TO BE REMOVED SHALL BE DONE SO IN THEIR ENTIRETY. ABANDONED CABLING SHALL NOT BE ACCEPTED. REMOVE ALL ASSOCIATED FIELD DEVICES AND HEAD END EQUIPMENT.
4. REMOVED EQUIPMENT AND SYSTEMS SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS OTHERWISE NOTED. MATERIALS NOT SALVAGED BY THE OWNER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR PROPER DISPOSAL.
5. REMOVE AND REINSTALL CEILING TILE REQUIRED FOR THE WORK BEING DONE UNDER THIS CONTRACT. DAMAGED CEILING TILE SHALL BE REPLACED TO MATCH EXISTING.
6. ***DO NOT CUT EXISTING TELECOMMUNICATIONS WIRING, CABLES OR CONDUIT AS EXISTING SYSTEMS SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. CONTRACTOR WHO CUTS IN-SERVICE CABLES SHALL BE RESPONSIBLE FOR DOWNTIME AND THE COSTS TO REPAIR.***

GENERAL PURPOSE PAGING SYSTEMS NOTES

1. PROVIDE A NEW IP PAGING SYSTEM AS ILLUSTRATED ON THE DRAWINGS. INCLUDE ALL NECESSARY HEAD END EQUIPMENT, SPEAKERS, AND ACCESSORIES NECESSARY FOR A COMPLETE INSTALLATION. REFER TO SPECIFICATION 27 51 16 FOR ADDITIONAL INFORMATION.
2. PAGING SYSTEM SHALL INCLUDE BACKGROUND MUSIC IN THE MAIN AUTOPSY B150 AND SOUND MASKING IN THE OPEN OFFICE AREAS.

TELECOMMUNICATIONS DISTRIBUTION NOTES

1. PROVIDE PENETRATIONS AND PATHWAYS AS REQUIRED TO ROUTE ALL CABLING INFRASTRUCTURE ILLUSTRATED IN THE DRAWINGS. TREAT EACH NEW PENETRATION AS A 1-HOUR FIRE RATED WALL UNLESS OTHERWISE NOTED. PROVIDE REQUIRED FIRE STOPPING TO MAINTAIN THIS RATING.
2. REAM CONDUIT TO REMOVE BURRS AND ROUGH EDGES. PROVIDE A PROTECTIVE BUSHING AT THE END OF ANY CONDUIT STUB TO PROTECT CABLING INFRASTRUCTURE.
3. PROVIDE CABLE SUPPORT FOR ROUTING ALL NEW INFRASTRUCTURE. INSIDE OF ABOVE ACCESSIBLE CEILING SPACES, CABLING CAN BE FLOWN FREE-AIR UTILIZING J-HOOKS, BRIDLE RINGS AND OTHER ACCESSORIES TO SUPPORT CABLING. CABLE SHALL NOT BE ALLOWED TO REST ON TOP OF CEILING TILES OR TO UTILIZE GRID SUPPORT SYSTEM.
4. ALL OPEN CEILING AREAS SHALL HAVE CABLING CONCEALED IN CONDUIT. EXPOSED CABLING SHALL NOT BE ACCEPTED.
5. ROUTE CONDUIT SERVING WORK AREA OUTLET DATA DIRECTLY TO THE CABLE TRAY. CONDUIT STUB SHALL BE DIRECTLY OVERHEAD OF THE TRAY TO ALLOW FOR CONVENIENT FUTURE MOVE, ADDS OR CHANGES.

STRUCTURED CABLING NOTES

1. BIDDING CONTRACTOR SHALL PULL AND NEATLY MANAGE ALL FIBER AND CATEGORY CABLING THROUGHOUT THE PROJECT BUT WILL NOT TERMINATE CABLING. OWNER'S VENDOR, ICN, SHALL PROVIDE ALL REQUIRED JACKS AND WILL TERMINATE AND TEST ALL CABLING.
2. BASE BID CABLING INCLUDES LEAVING THE EXISTING CABLING IN PLACE IN ALL WALLS THAT ARE NOT BEING REMOVED AND PROVIDING CATEGORY 6 CABLING TO ALL NEW DATA WORK AREA OUTLETS AND CAMERA LOCATIONS. BASE BID ALSO INCLUDES CATEGORY 6A CABLING TO ALL WIRELESS ACCESS POINT LOCATIONS.
3. CABLING ALTERNATE (ALTERNATE #4) SHALL INCLUDE CATEGORY 6A CABLING FOR ALL NEW DATA LOCATIONS AND REPLACING ALL EXISTING CATEGORY CABLING WITH CATEGORY 6A.

TECHNOLOGY GENERAL NOTES

1. ALL NOTES APPLY TO THE FOLLOWING SERIES SHEETS: TA, TS, TT
2. COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. BEGIN INSTALLATION AND ROUGH-IN ONLY AFTER PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION IS COMPLETE. COORDINATE WITH BUILDING STRUCTURE, ARCHITRAVE, MECHANICAL SHEET METAL, ALL PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, EQUIPMENT ACCESS/CLEARANCE, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT. CONTRACTOR IS RESPONSIBLE FOR REWORK OF INSTALLED EQUIPMENT RESULTING FROM INSUFFICIENT COORDINATION.
3. INCORPORATE THE REQUIREMENTS OF THE SPECIFICATIONS, DRAWINGS, AND STATE AND LOCAL CODES INTO THE INSTALLATION OF COMMUNICATIONS AND LIFE SAFETY/SECURITY SYSTEMS.
4. EACH TRADE IS RESPONSIBLE FOR MAKING PENETRATIONS WHERE REQUIRED IN EXISTING OR NEW WALLS, FLOORS, CEILINGS, AND ROOFS. MAKE PENETRATIONS NEAT. CONCEAL OR CAULK OVERCUT.
5. PROVIDE A PULL STRING IN ALL NEW CONDUITS FOR EASE OF CABLE INSTALLATION.

VIDEO MANAGEMENT NOTES

1. VIDEO MANAGEMENT SYSTEM SHALL BE PROVIDED BY THE OWNER'S VENDOR BASEPOINT. DETAILS ILLUSTRATED IN THE DRAWINGS ARE FOR PATHWAY AND ROUGH-IN REQUIREMENTS ONLY. COORDINATE ANY EXTERIOR PENETRATIONS CLOSELY WITH THE OWNER'S PREFERRED VENDOR TO ENSURE LOCATION AND ELEVATION ARE IN THE PROPER AREAS.
2. IT IS THE INTENT THAT ALL PATHWAYS, CABLING AND ROUGH-IN SERVING VIDEO MANAGEMENT SYSTEM SHALL BE RECESSED AND CONCEALED. EXPOSED CABLING OR SURFACE PATHWAYS SHALL NOT BE ACCEPTED.

ACCESS CONTROL/SECURITY MANAGEMENT NOTES

1. SECURITY MANAGEMENT SYSTEM SHALL BE PROVIDED BY THE OWNER'S VENDOR, BASEPOINT. DETAILS ILLUSTRATED IN THE DRAWINGS ARE FOR PATHWAY AND ROUGH-IN REQUIREMENTS ONLY. REVIEW SPECIFICATION SECTION 08 71 00 FOR ALL SPECIFIC ELEMENTS THAT ARE SCHEDULED AT EACH OPENING.
2. IT IS THE INTENT THAT ALL PATHWAYS AND ROUGH-IN SERVING ACCESS CONTROL SHALL BE RECESSED AND CONCEALED. EXPOSED CABLING OR SURFACE PATHWAYS SHALL NOT BE ACCEPTED.
3. DETAILS ILLUSTRATED IN THE DRAWINGS ARE NOT INTENDED TO ACCURATELY ILLUSTRATE CEILING TYPES, CEILING AND DECK HEIGHTS, DOOR SWING OR DOOR FINISHES. COORDINATE EACH OPENING'S SPECIFIC ROUGH-IN AND PATHWAY NEEDS WITH ARCHITECTURAL PLANS AND ELEVATIONS.

LIFE SAFETY & SECURITY DEMOLITION NOTES

1. ALL EXISTING DEVICES AND DEVICE LOCATIONS WERE MADE BY CASUAL FIELD OBSERVATION. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING SYSTEM COMPONENTS AND DEVICE LOCATIONS.
2. PROVIDE LABOR AND MATERIALS TO REMOVE ELECTRICAL FACILITIES AND CLEAR THE AREA TO RECEIVE THE NEW WORK TO BE PROVIDED UNDER THIS CONTRACT.
3. SYSTEMS SCHEDULED TO BE REMOVED SHALL BE DONE SO IN THEIR ENTIRETY. ABANDONED CABLING SHALL NOT BE ACCEPTED. REMOVE ALL ASSOCIATED FIELD DEVICES AND HEAD END EQUIPMENT.
4. REMOVED EQUIPMENT AND SYSTEMS SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS OTHERWISE NOTED. MATERIALS NOT SALVAGED BY THE OWNER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR PROPER DISPOSAL.
5. REMOVE AND REINSTALL CEILING TILE REQUIRED FOR THE WORK BEING DONE UNDER THIS CONTRACT. DAMAGED CEILING TILE SHALL BE REPLACED TO MATCH EXISTING.
6. DO NOT CUT EXISTING TELECOMMUNICATIONS WIRING, CABLES OR CONDUIT AS EXISTING SYSTEMS SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. CONTRACTOR WHO CUTS IN-SERVICE CABLES SHALL BE RESPONSIBLE FOR DOWNTIME AND THE COSTS TO REPAIR.

EQUIPMENT ROOM FITTINGS NOTES

1. TELECOMMUNICATIONS ROOM LAYOUT SHALL BE APPROVED BY THE OWNER PRIOR TO ANCHORING OR INSTALLING EQUIPMENT. PROVIDE A PRE-CONSTRUCTION COORDINATION MEETING AND INCLUDE DESIGN TEAM AND OWNER TO ENSURE PROPER CONFIGURATION OF SCHEDULED EQUIPMENT. ROOM LAYOUT ILLUSTRATED IN THE DRAWINGS IS FOR BID PURPOSES ONLY.
2. BIDDING CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS FOR TELECOMMUNICATION ROOM WALL COVERINGS:
   a. PROVIDE AC GRADE PLYWOOD THAT IS PAINTED ON ALL SIDES WITH TWO COATS OF A WHITE FIRE-RETARDANT PAINT.
   b. PROVIDE FIRE-RETARDANT AC GRADE PLYWOOD THAT IS PAINTED WHITE BUT LEAVING THE FIRE RETARDANT MARKINGS/SEAL EXPOSED FOR INSPECTION PURPOSES.
3. ANCHOR RACK(S) TO THE FLOOR OR WALL UTILIZING MANUFACTURER APPROVED HARDWARE.
4. PROVIDE ALL REQUIRED CABLE TRAY/RUNWAY ACCESSORIES INCLUDING BUT NOT LIMITED TO: WATERFALL RADIUS DROP, OFFSETS, BRACKETS, AND RACK ATTACHMENT HARDWARE.
5. CLEAN ALL SURFACES OF ROOM PRIOR TO OWNER'S INSTALLATION OF ACTIVE NETWORK EQUIPMENT.

TECHNOLOGY RESPONSIBILITY MATRIX

PROVISION RESPONSIBILITIES DEFINED	OFOI	OFCI	CFCI	CFOI
COMMUNICATIONS - TELECOM SYSTEMS:				
ROUGH-IN, PATHWAYS AND SLEEVES			●	
RACKS, FRAMES AND ENCLOSURES			●	
CABLE MANAGEMENT			●	
UNINTERRUPTIBLE POWER SUPPLIES (RACK MOUNT)	●			
PLYWOOD BACKBOARDS			●	
OPTICAL FIBER BACKBONE CABLING			●	
BACKBONE CABLING TERMINATION AND TESTING	●			
COPPER HORIZONTAL CABLING			●	
HORIZONTAL CABLING TERMINATION AND TESTING	●			
PATCH PANELS	●			
DATA CONFIGURATION PER SWITCH/IDF AND WIRE	●			
DATA COMMUNICATIONS WIRELESS ACCESS POINTS		●		
VOICE COMMUNICATIONS PATCHING AND BOOTING EQUIPMENT	●			
COMMUNICATIONS - AUDIO-VISUAL SYSTEMS:				
ROUGH-IN, PATHWAYS AND SLEEVES			●	
VIDEO CONFERENCING SYSTEMS	●			
AUTOPSY SUITE SYSTEMS			●	
NON-VIDEO CONFERENCING SYSTEMS			●	
COMMUNICATIONS - DISTRIBUTED SYSTEMS:				
ROUGH-IN, PATHWAYS AND SLEEVES			●	
PUBLIC ADDRESS SYSTEM			●	
WIRED / WIRELESS CLOCK SYSTEM			●	
SECURITY - ACCESS CONTROL:				
ROUGH-IN, PATHWAYS AND SLEEVES			●	
SECURITY MANAGEMENT SYSTEM - HEAD END COMPONENTS	●			
SECURITY MANAGEMENT SYSTEM - FIELD DEVICES	●			
SECURITY MANAGEMENT SYSTEM - ELECTRIFIED DOOR HARDWARE	●			
SECURITY MANAGEMENT SYSTEM - ALL CABLING			●	
SECURITY - VIDEO INTERCOM:				
ROUGH-IN, PATHWAYS AND SLEEVES			●	
DOOR STATION(S)	●			
HEAD END EQUIPMENT AND COMPONENTS	●			
SECURITY - VIDEO SURVEILLANCE:				
ROUGH-IN, PATHWAYS AND SLEEVES			●	
CAMERA(S)	●			
HEAD END EQUIPMENT AND COMPONENTS	●			

● OFOI OWNER FURNISHED & OWNER INSTALLED
● OFCI OWNER FURNISHED & CONTRACTOR INSTALLED
● CFCI CONTRACTOR FURNISHED & CONTRACTOR INSTALLED
● CFOI CONTRACTOR FURNISHED & OWNER INSTALLED

GENERAL NOTE:
A. MATRIX IS NOT INTENDED TO BE EXHAUSTIVE TO COVER ALL MATERIALS NECESSARY FOR SCOPE AND SHOULD ONLY BE USED TO QUICKLY IDENTIFY SYSTEMS AND RELATED INFRASTRUCTURE INSIDE AND OUTSIDE THE BID OF THIS PROJECT. ANY ITEMS FURNISHED OR INSTALLED BY THE BIDDING CONTRACTOR SHALL COVER ALL REQUIRED APPURTENANCES NECESSARY FOR A COMPLETE SYSTEM. THIS SHALL INCLUDE BUT NOT BE LIMITED TO, EQUIPMENT, ACCESSORIES, TERMINATIONS, TERMINATION COMPONENTS, ALL FINAL CORDAGE CONNECTIVITY, SOFTWARE, PROGRAMMING, AND THE LABOR TO INSTALL.

ABBREVIATIONS - TECHNOLOGY

ADDL	ADDITIONAL
AL	AUDIO LEFT
AR	AUDIO RIGHT
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL, ALARM VALVE
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BAT	BATTERY
BFF	BELOW FINISH FLOOR
BKGD	BELOW / UNDERGROUND
BLDG	BUILDING
BLW	BELOW / UNDERGROUND
BOT	BOTTOM
BTWN	BETWEEN
C	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
CD	CONSTRUCTION DOCUMENT
CL	CENTER LINE, CLOSE, CLOSET
CM	CONSTRUCTION MANAGER
CTRL	CONTROL
CTV	CABLE TELEVISION, CONTROL VALVE
(D)	EXISTING TO BE DEMOLISHED
DEF	DEFINITION
DEG	DEGREE
DEMO	DEMOLITION
DESCR	DESCRIPTION
DET	DETAIL
DGTL	DIGITAL
DIAG	DIAGRAM
DWG	DRAWING
E	EXISTING TO REMAIN
ER	EXISTING TO BE RELOCATED
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC, ELECTRICAL
EM	EMERGENCY LIGHT FIXTURE
EMER	EMERGENCY
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EXCL	EXCLUDE
FBO	FURNISHED BY OTHERS
FLEX	FLEXIBLE
FR	FLOOR RECEPTACLE, FIRE RATING
FREQ	FREQUENCY
FT	FOOT, FEET
FUT	FUTURE
G	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GC	GENERAL CONTRACTOR
IRE	INFRARED EMITTER
JB	JUNCTION BOX
KVA	KILO-VOLT-AMPERES
KW	KILOWATTS
LVC	LOW VOLTAGE CONTROL
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUGS ONLY
MAX	MAXIMUM
MLC	MOTOR LOGIC CONTROL
MTD	MOUNTED
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NO	NORMALLY OPEN, NUMBER
NTS	NOT TO SCALE
OAE	OR APPROVED EQUAL
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
PB	PULL BOX, PUSH BUTTON
PNL	PANEL
PWR	POWER
QTY	QUANTITY
R	EXISTING ITEM TO BE REMOVED
RR	EXISTING ITEM TO BE REMOVED AND RELOCATED
RN	EXISTING ITEM TO BE REMOVED AND REPLACED WITH NEW
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RECPT	RECEPTACLE
REQD	REQUIRED
RGS	RIGID GALVANIZED STEEL
RM	ROOM
S	SYNC
SCCR	SHORT CIRCUIT CURRENT RATING
SCHED	SCHEDULE
SECT	SECTION
SPEC	SPECIFICATION
SPKR	SPEAKER
STP	SHIELDED TWISTED PAIR(S)
SYS	SYSTEM
TBD	TO BE DETERMINED
TC	TECHNOLOGY CENTER
TEL	TELEPHONE
TM	TERMINAL BLOCK
TV	TELEVISION
TYP	TYPICAL
UC	UNDERCOUNTER
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTIL	UTILITY
V	VIDEO, VOLT, VENT
VCR	VIDEO CASSETTE RECORDER
W	WATT, WIRE, WALL PHONE, WIDTH
WG	WIREGUARD COVER
WP	WEATHERPROOF DEVICE
WR	WEATHER RESISTANT DEVICE, WALL RECEPTACLE
XFER	TRANSFER
XFMR	TRANSFORMER
"24"	INDICATES MOUNTING HEIGHT CENTER LINE OF DEVICE TO FINISHED FLOOR

GENERAL SYMBOLS

- CONDUIT SLEEVE
- CONDUIT UP, REFER TO TAG ON DRAWING FOR SIZE
- CONDUIT DOWN, REFER TO TAG ON DRAWING FOR SIZE
- KEYNOTE
- POINT OF CONNECTION
- POINT OF DISCONNECTION
- EQUIPMENT IDENTIFICATION TAG. REFER TO EQUIPMENT CONNECTION SCHEDULE
- DETAIL CALLOUT
- DETAIL CALLOUT - DOOR HARDWARE
- DETAIL DRAWING REFERENCE TAG, SIM-SIMILAR, TYP-TYPICAL, OPP-OPPOSITE SHEET REFERENCE
- SECTION CUT REFERENCE TAG, SIM-SIMILAR, TYP-TYPICAL, OPP-OPPOSITE SHEET REFERENCE
- INTERIOR ELEVATION DRAWING REFERENCE TAG
- REVISION CLOUD (DELTA 1)

GROUNDING AND BONDING SYMBOLS

- GROUND BAR
- PRIMARY BONDING BUSBAR
- SECONDARY BONDING BUSBAR

SEE RISER DIAGRAM AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

TELECOMMUNICATION SYMBOLS

- DATA CABLING
- WIRELESS ACCESS POINT - TWO (2) CATEGORY 6A CABLES
- FLOOR MOUNTED OUTLET IN A MULTI-GANG FLOORBOX WITH SINGLE GANG OPENING, PROVIDED BY OTHERS
- CEILING MOUNTED OUTLET (FOR CEILING MOUNTED SECURITY CAMERA)
- BIOMETRIC READER WORK AREA OUTLET
- HAND HOLE LOCATED AT GRADE / GROUND SURFACE
- MAINTENANCE HOLE - BURIED CONCRETE REINFORCED TELECOM VAULT WITH STEEL COVER AND FRAME.
- SYSTEM FURNITURE FEED FOR TELECOMMUNICATION CABLES,
- WALL MOUNTED JUNCTION BOX (SUBSCRIPT DENOTES NUMBER OFGANG), MOUNTED AT SAME HEIGHT AS ASSOCIATED AV INPUT PANEL.
- CLOCK - "2" INDICATES DUAL FACE - "X" INDICATES TYPE

VIDEO SURVEILLANCE SYMBOLS

- CCTV SECURITY CAMERA, WALL MOUNTED - PROVIDE (1) CATEGORY CABLE
- CCTV SECURITY CAMERA, CEILING MOUNTED - PROVIDE (1) CATEGORY CABLE
- NVR — NETWORK VIDEO RECORDER

AUDIO VISUAL SYMBOLS

WALL	CEILING	TABLE/ FLOOR	
			STANDARD AUDIOVISUAL SPEAKER ("Z" DENOTES ZONE)
			STANDARD AUDIOVISUAL MICROPHONE
			AUDIOVISUAL MICROPHONE - OMNI
			AUDIOVISUAL EQUIPMENT RACK
			FLAT PANEL DISPLAY. SEE PLANS FOR DETAILS.
			AUDIOVISUAL INPUT PLATE
			AUDIOVISUAL VOLUME CONTROL
			AUDIOVISUAL CAMERA - REFER TO CAMERA SCHEDULE
			AUDIOVISUAL PARTITION SENSOR
			WALL MOUNTED AV CONTROL PANEL SYSTEM
			GANGABLE JUNCTION BOX (BY DIV. 26)
			CUSTOM BACK BOX TO BE OEM BY MANUFACTURER. MOUNT FLUSH WITH FINISHED WALL TREATMENT.
			SCREW COVER JUNCTION BOX FOR AUDIOVISUAL CONDUIT TERMINATION
			MULTI-SERVICE BOX (AV/DATA/PWR)
			IN-WALL BOX, WITH DIVIDED COMPARTMENTS FOR SHARED ACCESS WITH AUDIOVISUAL, DATA AND 120VAC OPOWER
			IN-WALL BOX, WITH DIVIDED COMPARTMENTS FOR SHARED ACCESS WITH AUDIOVISUAL, DATA AND 120VAC OPOWER
			TELECOMMUNICATIONS DATA OUTLET, SEE TELECOM
			SPECIALTY TELECOMMUNICATIONS DATA OUTLET, SEE TELECOM
			COAX CABLE OUTLET, SEE TELECOM DRAWINGS FOR
			MOTOR FOR PROJECTION SCREEN WITH INTERFACE FOR AUDIOVISUAL CONTROLS.
			RAISE AND LOWER SWITCH FOR PROJECTION SCREEN ACCOMPANYING DEVICE.

TECHNOLOGY DRAWING LIST

NO.	TITLE
T000	TECHNOLOGY COVER
T100	TECHNOLOGY - SITE PLAN
TA101A	AUDIO VISUAL - MAIN LEVEL - ADDITION
TA101B	AUDIO VISUAL - MAIN LEVEL - RENOVATION
TA300	AUDIO VISUAL DETAILS
TA400	AUDIO VISUAL DETAILS
TD201	TECHNOLOGY - ADDITION DEMO
TD202	TECHNOLOGY - RENOVATION DEMO
TS102A	SECURITY CEILING PLAN - MAIN LEVEL - ADDITION
TS102B	SECURITY CEILING PLAN - MAIN LEVEL - RENOVATION
TS200	ACCESS CONTROL DETAILS
TT101A	TECHNOLOGY - MAIN LEVEL - ADDITION
TT101B	TECHNOLOGY - MAIN LEVEL - RENOVATION
TT103	TELECOM ENLARGED PLANS & DETAILS

OPN ARCHITECTS
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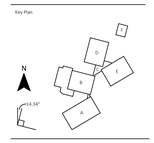
Key Plan



Revision	Description	Date
ADD 02	ADDENDUM 02	12/05/2025

OPN Project No. **23825001**
SCH Project No. **9429.00**

Sheet Issue Date
BID DOCUMENTS **11/13/2025**

Sheet Name
TECHNOLOGY COVER

Sheet Number
T000

PROFESSIONAL SEALS

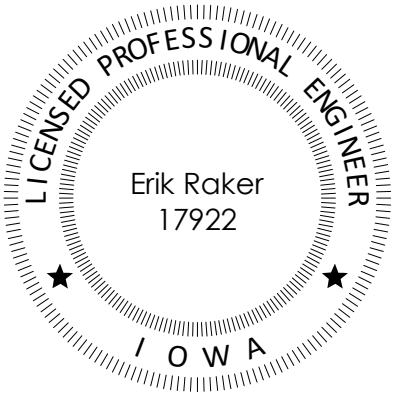
I hereby certify these plans and specifications were prepared by me or under my direct personal supervision and that I am a duly licensed professional architect under the laws of the state of Iowa.

Signature: _____

Name: Terry Gebard

Iowa Registration No: 05219 **Renewal Date:** 6/30/2026

Discipline: Architectural
Pages or sheets covered by this seal: General, Demo, & Architectural Series
Divisions: 00-14; and as specifically noted



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Signature: _____

Name: Erik Raker

Iowa Registration No: 17922 **Renewal Date:** 12/31/2025

Discipline: Structural
Pages or sheets covered by this seal: Structural Series
Sections: 033000, 042000, 051200, 052100, 053100, 054000, 061600, 316100

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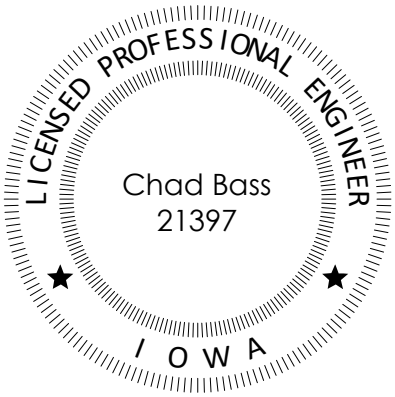
Signature: _____

Name: Justin F. Strom

Iowa Registration No: P24140 **Renewal Date:** 12/31/2026

Discipline: Civil
Pages or sheets covered by this seal: Civil Series
Sections: 024123
Divisions: 31-33, except as specifically noted



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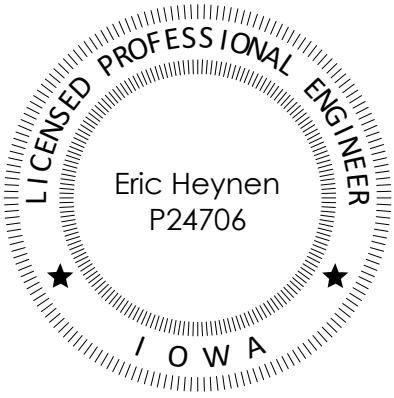
Signature: _____

Name: Chad Bass

Iowa Registration No: 21397 **Renewal Date:** 12/31/2025

Discipline: Mechanical
Pages or sheets covered by this seal: Fire Suppression, Plumbing, HVAC Series
Divisions: 21-23, except as specifically noted



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Signature: _____

Name: Eric Heynen

Iowa Registration No: P24706 **Renewal Date:** 12/31/2025

Discipline: Electrical
Pages or sheets covered by this seal: Electrical & Technology Series
Sections: 134613
Divisions: 26-28

END OF SECTION

PROFESSIONAL SEALS

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Iowa Registration No: 05219 **Renewal Date:** 6/30/2026

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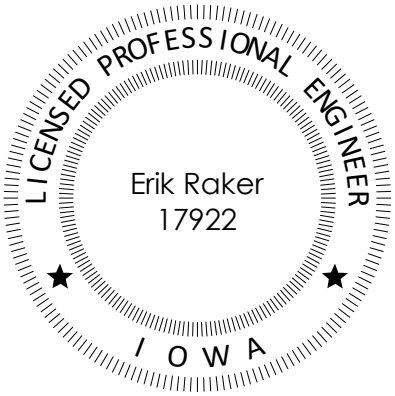

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Iowa Registration No: P24140 **Renewal Date:** 12/31/2026

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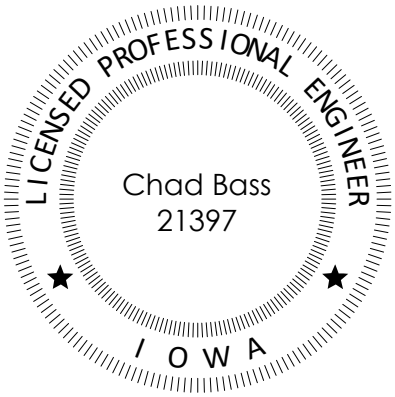

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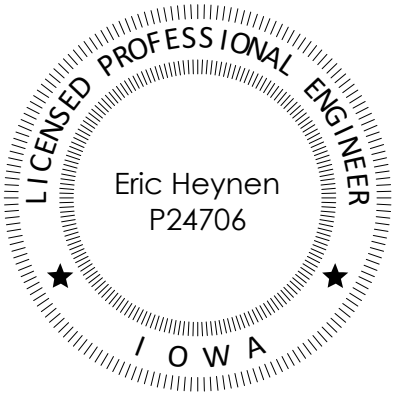

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Name: Eric Heynen

Iowa Registration No: P24706 **Renewal Date:** 12/31/2025

Discipline: Electrical
Pages or sheets covered by this seal: Electrical & Technology Series
Sections: 134613
Divisions: 26-28

END OF SECTION

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RESPONSIBILITY ABBREVIATIONS

AHC	STUDIO 08
OPN	OPN ARCHITECTS
MWL	MCCLAREN WILSON & LAWRIE ARCHITECTS
RRE	RAKER RHODES ENGINEERING
KCL	KCL ENGINEERING
SNY	SNYDER & ASSOCIATES
SYS	SYSTEMWORKS
SOI	STATE OF IOWA
WTZ	WEITZ COMPANY
LB	LERCH BATES

END OF SECTION

PROFESSIONAL SEALS

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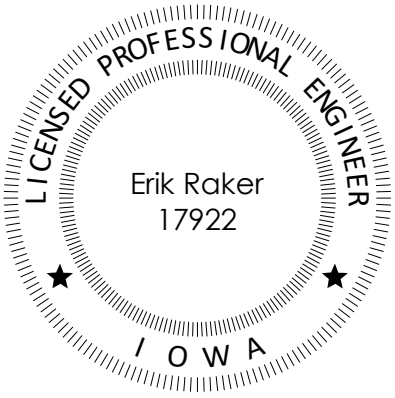

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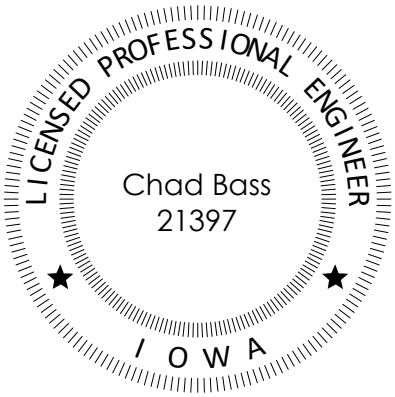

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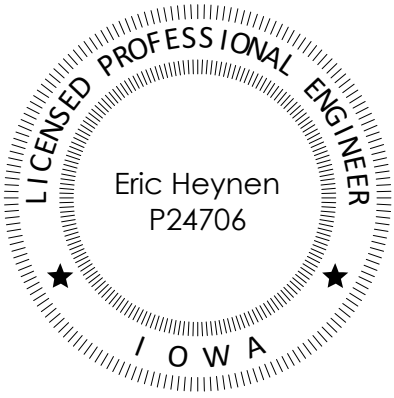

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Iowa Registration No: P24706 **Renewal Date:** 12/31/2025

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Sections: 134613
Divisions: 26-28

END OF SECTION

SECTION 00 03 10
VOLUME 3 TABLE OF CONTENTS

SPECIFICATIONS

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27 05 05	Selective Demolition of Communications Systems	KCL
27 05 28	Pathways for Communications Systems	KCL
27 05 44	Sleeves and Sleeve Seals for Communications Pathways and Cabling	KCL
27 05 53	Identification for Communications Systems	KCL

27 10 00	Structured Cabling	KCL
27 41 01	Audio-Visual Systems	KCL
27 51 16	Public Address Systems	KCL
27 53 15	Wireless Clock Systems	KCL
27 53 19	Distributed Antenna System	KCL

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 00 00	General Requirements for Electronic Safety & Security Systems	KCL
28 44 00	Refrigerant Detection and Alarm	KCL
28 46 00	Digital, Addressable Fire Alarm System	KCL

DIVISION 31 -- EARTHWORK

31 20 00	Excavation and Earthwork	SNY
31 23 33	Trench Excavation and Backfill	SNY
31 25 00	Erosion and Sediment Control	SNY
31 61 00	Rammed Aggregate Piers	RRE

DIVISION 32 -- EXTERIOR IMPROVEMENTS

32 13 13	Concrete Paving	SNY
32 17 23	Pavement Markings	SNY
32 31 00	Chain Link Fence	SNY
32 92 19	Seeding	SNY
32 93 00	Plant Material and Planting	SNY

DIVISION 33 -- UTILITIES

33 01 12	Water Testing and Disinfecting	SNY
33 14 16	Water Main and Appurtenances	SNY
33 14 23	Water Utility Distribution Equipment	SNY
33 31 14	Cleaning, Inspection, and Testing of Sewers	SNY
33 41 00	Subdrains and Footing Drain Collectors	SNY
33 42 11	Storm Utility Piping	SNY
33 42 31	Storm and Sanitary Structures	SNY
33 42 32	Cleaning, Inspection, and Testing of Structures	SNY

RESPONSIBILITY ABBREVIATIONS

AHC	STUDIO 08
OPN	OPN ARCHITECTS
MWL	MCCLAREN WILSON & LAWRIE ARCHITECTS
RRE	RAKER RHODES ENGINEERING
KCL	KCL ENGINEERING
SNY	SNYDER & ASSOCIATES
SYS	SYSTEMWORKS
SOI	STATE OF IOWA
WTZ	WEITZ COMPANY
LB	LERCH BATES

END OF SECTION

SECTION 00 11 13

NOTICE TO BIDDERS

RFB942900-01

The Iowa Department of Administrative Services will be receiving bids for the expansion and renovation of the Office of the State Medical Examiner, Ankeny, Iowa 50023.

The Iowa Department of Administrative Services anticipates construction to begin in March 2026 and end in July 2028.

Bids must be received no later than **2:00 pm, Tuesday, December 16, 2025**. Late bids will not be considered. Bids shall be submitted on IMPACS Electronic Procurement System. The Bid shall be accompanied by a Bid Security as set forth in the Instructions to Bidders in the amount of 5% of the total bid amount. Each bid shall be accompanied by a bid bond, cashier's check or a certified check drawn upon a solvent bank chartered under the laws of the United States of America.

Bid Opening
The time and place of bid opening will be held at meet.google.com/mqg-cwyg-rom and teleconference number +1 470-327-0670, PIN: 787 675 554# at 3:00pm on December 16, 2025.

The Iowa Department of Administrative Services reserves the right to reject any and all bids, and to waive irregularities and to accept a bid that is deemed in the best interest of the State of Iowa.

Bidders must comply with all affirmative action/equal employment opportunity provisions of the State of Iowa and the Federal Government.

This project is exempt from Iowa Sales Tax. Davis Bacon Wages **will not** apply to this project.

Questions must be submitted by 5:00pm, December 9, 2025, to the Issuing Officer.

Bidding documents may stipulate a specific product. Substitute product will be considered if a written request is received by 5:00pm, December 9, 2025, prior to bid opening. Substitution requests will be considered for all products per Section 01 2500 Substitution Procedures, even if the specification does not include a statement such as "or equal," "equal to," "equivalent to," or "basis of design," unless otherwise noted.

Pre-Bid meetings will be held on Wednesday, November 19, 2025, at 2:30pm and Wednesday, December 3, 2025, at 2:30pm at the Office of the State Medical Examiner, located at 2250 S Ankeny Blvd, Ankeny, Iowa 50023. November 19, 2025, pre-bid meeting will be held in Rooms 207 & 208. December 3, 2025, pre-bid meeting will be held in Rooms 207, 208 & 209. **A third pre-bid meeting will be held on December 11, 2025 at 2pm at 2250 S Ankeny Blvd, Ankeny, Iowa 50023 in Rooms 207 & 208.** Attendance at one of the two pre-bid meetings is mandatory (required to qualify for bidding) for the bid packages listed below:

- Bid Package 003A Concrete (Foundations/SOG/Misc Concrete)
- Bid Package 005A Structural Steel & Misc Metals (Material & Install)
- Bid Package 006A General Construction
- Bid Package 009A Gypsum Wallboard, Insulation & Ceilings, Painting & Wallcovering
- Bid Package 021A Fire Protection
- Bid Package 022A Mechanical (HVAC, Plumbing & BAS)
- Bid Package 026A Electrical (Fire Alarm, Structured Cabling, Security, Access Control & AV)
- Bid Package 031A Selective Site Demo, Grading/Excavating, Site Utilities, Site Paving & Exterior Improvements

Bidding Documents, including drawing sheets bearing the project name Iowa Department of Administrative Services – HSS ANK IMEO Expansion & Renovation, dated 11/13/2025 and the Project Manual prepared by OPN Architects dated 11/13/2025, may be obtained from Rapids Reproductions by visiting rapidsreproplanroom.com or by calling (515) 251-3222 on Friday, November 14, 2025.

For further information regarding this project contact:
Michael Bradbury – Issuing Officer
Phone: (515) 823-9327
E-Mail: construction.procurement@iowa.gov

END OF SECTION

SECTION 00 41 13.01

NON-DISCRIMINATION CLAUSE

This Section is for informational purposes only. All information will be submitted online through the State's IMPACS Electronic Procurement System.

PART 1 - GENERAL

All contractors, subcontractors, vendors and suppliers of goods and services doing business with the State of Iowa and value of said business equals or exceeds $10,000 annually, agree as stated below.

1.01 NONDISCRIMINATION CLAUSE

A. The contractor, subcontractor, vendor and supplier of goods and services will not discriminate against an employee or applicant for employment because of race, creed, color, sex, national origin, ancestry, religion, economic status, age, disability, political opinion, or affiliations of an applicant or employee based upon the nature of the job occupation. The contractor, subcontractor, vendor and supplier will develop an Affirmative Action Program to insure that applicants are employed and that employees are treated during employment without regard to their race, creed, color, sex, national origin, ancestry, religion, economic status, age, disability, political opinions or affiliations. Such action shall include, but not be limited to the following:
   1. Employment.
   2. Upgrading.
   3. Demotion or transfer.
   4. Recruitment and advertising.
   5. Layoff or termination.
   6. Rates of pay or other forms of compensation.
   7. Selection for training, including apprenticeship.

B. 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, ancestry, religion, economic status, age, disability, political opinion or affiliations.

C. The contractor, subcontractor, vendor and supplier or their collective bargaining representative will send to each labor union or representative or workers with which they have a collective bargaining agreement or other contract or understanding, a notice advising the said labor union or workers' representative of the contractor's commitments under this section.

D. The contractor, subcontractor, vendor and supplier of goods and services will comply with all published rules, regulations, directives and orders of the State of Iowa Affirmative Action Program Contract Compliance Provisions.

E. 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 Equal Employment Opportunity Officer, said forms may elicit information as to the policies, procedures, patterns, and practices of each subcontractor as state as the contractor themselves and said contractor, subcontractor, vendor and supplier will permit access to their employment books, records and accounts to the State's Equal Employment Opportunity Officer, for the purpose of investigation to ascertain compliance with this Contract and with rules regulations of the State's Affirmative Action Program.

F. In the event of the contractor's noncompliance with the nondiscrimination 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 State of Iowa.

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

H. The parties agree to comply with "Compliance with the Law; Nondiscrimination in Employment" of the current Terms and Conditions at the award of this contract. Current Terms and Conditions may be found on the following web site and are, by this reference, made a part of this Agreement. https://das.iowa.gov/procurement/terms-and-conditions

I. We certify and recognize that we are morally and legally committed to nondiscrimination in employment. Any person who applies for employment with our company will not be discriminated against because of race, creed, color, sex, national origin, ancestry, religion, economic status, age or disabilities, unless disabilities are based upon the nature of the job occupation.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 00 41 13.02

TARGETED SMALL BUSINESS INFORMATION

This Section is for informational purposes only. All information will be submitted online through the State's IMPACS Electronic Procurement System.

PART 1 - GENERAL

1.01 TARGETED SMALL BUSINESS INFORMATION

A. Subcontractor Targeted Small Business Enterprise Pre-Bid Contact Information, including subcontractor and dollar amount to be subcontracted, is to accompany the Bid submission. Bidders shall comply with all affirmative action/equal opportunity provisions of State and Federal laws. The Owner seeks to provide opportunities for Targeted Small Businesses in accordance with the provisions of Chapter 73 of the Code of Iowa.

B. Search the Targeted Small Business Directory for certified State of Iowa Targeted Small Businesses.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

IOWA DEPARTMENT OF ADMINISTRATIVE SERVICES
SUBCONTRACTOR
TARGETED SMALL BUSINESS ENTERPRISE
PRE-BID CONTRACT INFORMATION

CONTRACTOR	**BID NO.**	**PAGE #**

(to be completed by bidder)

You are requested to provide the information on this form showing your targeted Small Business enterprises contacts made prior to your bid submission. This information is subject to verification and confirmation. NOTE: The Department of General Services will not regard your acceptance or use of a low quote or bid from a non-targeted Small Business Enterprise on any subcontract item as evidence itself of any lack of good faith effort to solicit targeted Small Business Enterprise subcontractors on this project. However, every effort shall be made to solicit quotes or bids on as many subcontractable items as necessary to evidence affirmative action in contracting.

TABLE OF INFORMATION SHOWING BIDDER'S PRE-BID TARGETED SMALL BUSINESS ENTERPRISE CONTACTS

SUBCONTRACTOR	TSB	DATES CONTACTED	QUOTES RECEIVED		QUOTATION USED IN BID	
			YES/NO	DATES	YES/NO	DOLLAR AMOUNT PROPOSED TO BE SUBCONTRACTED

Total dollar amount proposed to be subcontracted to TSB on this project $ _____

List items to be subcontracted. *(If more space is needed, use reverse side.)*

SECTION 01 12 00.006A
BP 006A – GENERAL CONSTRUCTION

Section 1. Contractor's Work

The Contractor's Work includes all labor; supervision; materials; equipment; services; supplies; tools; facilities; transportation; storage; receiving; licenses; inspections; certifications; overhead; profit; insurance; and other items required or reasonably inferable to properly and timely perform and complete all work and services to be performed by the Contractor pursuant to this Agreement. Unless specifically stated otherwise, incidental work required to accomplish the work of this Bid Package shall be included in the bid. This would include, but not be limited to temporary facilities, protection of the work, security of equipment, materials, and work in progress, etc. Contractor's Work shall be completed in compliance with the standards described in the Prime Contract and in the Drawings and Specifications, or, if no such standards are specified, in compliance with industry standards.

Contractor's work includes the following Specification Division(s) and/or Section(s):

Spec Section	**Description**
Division 00	Procurement and Contracting Requirements
Division 01	General Requirements
02 41 00	Demolition
03 54 00	Cast Underlayment
05 50 00	Metal Fabrications (as applicable to this scope)
06 10 00	Rough Carpentry
06 20 00	Finish Carpentry
06 41 00	Architectural Wood Casework
07 84 00	Firestopping (As applicable to this scope)
07 91 00	Preformed Joint Seals
07 92 00	Joint Sealants (as applicable to this scope)
07 95 13	Expansion Joint Cover Assemblies
08 11 13	Hollow Metal Doors and Frames
08 11 19	Stainless-Steel Doors and Frames
08 14 16	Flush Wood Doors
08 33 23	Overhead Coiling Doors
08 42 29	Automatic Entrances
08 71 00	Door Hardware
09 05 61	Common Work Results for Flooring Preparation
09 30 00	Tiling
09 65 00	Resilient Flooring and Base
09 67 00	Fluid Applied Flooring
09 68 13	Tile Carpeting
10 11 00	Visual Display Units
10 14 19	Dimensional Letter Signage
10 14 23	Panel Signage
10 26 00	Wall and Door Protection
10 28 00	Toilet, Bath and Laundry Accessories

10 44 00	Fire Protection Specialties
10 51 00	Metal Lockers
10 57 23	Closet and Utility Shelving
11 13 13	Loading Dock Bumpers
11 13 19	Stationary Loading Dock Equipment
11 30 13	Appliances
11 53 00	Laboratory Equipment
11 53 13	Laboratory Fume Hoods
11 53 60	Autopsy & Morgue Equipment
12 24 00	Window Shades
12 35 53	Laboratory Casework
12 36 00	Countertops, Sills and Solid Surface Wall Panels
13 21 26	Cold Rooms
13 49 13	Integrated X-Ray Shielding Assemblies (as applicable to this scope)

Section 2. Contract Inclusions

The Contractor's Work specifically includes, but is not limited to the following:

2.1. General Scope Applicable to all Trades

2.1.1. Pricing escalations for all materials, equipment, product shortages or product availability or any other cause are the responsibility of the Contractor. Contractor shall take all necessary measures to ensure materials are procured in a manner that supports the Construction Manager's scheduled start dates, uninterrupted progress and activity durations. Storage for early procurement of materials if required will be the Contractor's responsibility and will be considered a means and method of construction to ensure timely completion of the work. All onsite-stored material shall be housed in accordance with requirements set forth within the Contract Documents. All cost escalations are included in the Contract Sum.

2.1.2. Joint Sealant Responsibility

2.1.2.1. In General, each Contractor is responsible for all joint sealants required to complete their scope of work's system.
2.1.2.2. Floor and Wall Penetrations – By Contractor Installing Penetration
2.1.2.3. Sealed Concrete Control Joints or Concrete Expansion Joints – By Concrete Contractor (BP 003A)
2.1.2.4. Brick and Masonry Wall System, Including Top of Walls to Structure – By Masonry Contractor (BP 004A)
2.1.2.5. Casework/Countertops – By GC Package Contractor (BP 006A)
2.1.2.6. Tile Control Joints – By GC Package Contractor (BP 006A)
2.1.2.7. Fluid Applied Cove Base to Wall – By GC Package Contractor (BP 006A)
2.1.2.8. Corner & Wall Guards to Wall – By GC Package Contractor (BP 006A)

2.1.2.9. Door Frames in Block Walls & Exterior Walls – By GC Package Contractor (BP 006A)
2.1.2.10. Fire Extinguisher Cabinet to Wall - By GC Package Contractor (BP 006A)
2.1.2.11. Roofing – By Roofing Contractor (BP 007A)
2.1.2.12. Metal Panels – By Metal Panels Contractor (BP 007B)
2.1.2.13. Aluminum Entrances – By Glazing Contractor (BP 008A)
2.1.2.14. Curtainwall System and Windows – By Glazing Contractor (BP 008A)
2.1.2.15. Drywall Wall System, Including Bottom & Top of Walls – By Drywall Package Contractor (BP 009A)
2.1.2.16. Drywall to Drywall Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.2.17. Drywall to Masonry Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.2.18. Drywall to any other surface - By Drywall Package Contractor (BP 009A)
2.1.2.19. Interior Door & Window Frames – By Drywall Package Contractor (BP 009A)
2.1.2.20. Aesthetic Sealant Between Drywall and Aluminum Frames – By Drywall Package Contractor (BP 009A)
2.1.2.21. Elevator Door Frames – By Drywall Package Contractor (BP 009A)
2.1.2.22. Site Paving – By Site Paving Contractor (BP 031A)

2.1.3. Fire Stopping Responsibility

2.1.3.1. In General, each Contractor is responsible for all fire stopping to complete their scope of work's system. Hilti Products must be used.
2.1.3.2. Floor and Wall Penetrations – By Contractor Installing Penetration
2.1.3.3. Top of Masonry Wall – By Masonry Contractor (BP 004A)
2.1.3.4. Masonry to Masonry Wall Transition – By Masonry Contractor (BP 004A)
2.1.3.5. Top of Drywall Wall – By Drywall Package Contractor (BP 009A)
2.1.3.6. Drywall to Drywall Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.3.7. Drywall to Masonry Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.3.8. Drywall to any other surface – By Drywall Package Contractor (BP 009A)
2.1.3.9. Edge of Slab – By Drywall Package Contractor (BP 009A)

2.2. Construction Support

2.2.1. Contractor shall furnish and maintain (6) 0.5 cubic yard general debris/trash carts from the time slabs are poured through project completion. Contractor includes emptying these trash carts on a daily basis or as needed. Location of trash carts as directed by Construction Manager. This includes providing a lull, skip box and operator to be able to dump these carts into the dumpster(s).
2.2.2. Contractor to furnish and place a large floor mat inside each exterior door once finishes start going into place. Contractor includes having these mats cleaned and replaced on a weekly basis through Substantial Completion. Mat locations will need to be adjusted throughout the project as shown in the phasing plans.
2.2.3. Contractor shall include sweeping the entire building twice weekly with sweeping compound, once slabs are complete, through the duration of the project. This includes

ensuring that dirt/debris trapped around the perimeter of the rooms or in corners of the rooms is removed. Use vacuum crevice tool attachment as necessary.

2.2.4. Provide sweeping compound for general clean up by all Prime Contractors from the time slabs are poured to project completion.

2.2.5. Contractor shall include labor to walk the site in its entirety once a week to pickup trash around the jobsite including trash that has blown out of the dumpster(s). This also includes using a magnet to pick up any misc. fasteners/steel on the site.

2.2.6. Contractor is responsible for maintaining carpeted areas through completion of punchlist, at least one (1) thorough vacuuming per week. Contractor includes furnishing and installing carpet runners at carpeted rooms. Runner to be the width of the door opening(s) and extend 10ft into the rooms. Runners shall also be installed around the perimeter of each Open Office Area plus the most common path of travel through those rooms. Contractor shall vacuum the rooms once the carpet has been installed and then immediately install the temporary protection. Contractor to tape down all edges of the runners. Contractor to remove runners when directed by the Construction Manager.

2.2.7. Contractor shall protect terrazzo flooring from completion of install through completion of punchlist. Contractor includes the furnishing, installation, maintenance, and removal of 5/8” plywood on top of Tyvek.

2.2.8. Contractor shall furnish, install, maintain, and remove 5/8” plywood on top of Tyvek in existing building at locations of flooring to remain in place, in areas where other renovations are to take place and in high traffic areas during the renovation.

2.2.9. Contractor includes having a skid steer with sweeper attachment and operator on site beginning during the wood blocking scope of work through project completion. Contractor includes sweeping the project paving and City streets as needed. Necessary spotters/flaggers are included.

2.2.10. Provide, maintain and remove countertop protection until final cleaning. Include cardboard or ramboard at a minimum.

2.2.11. Contractor shall furnish, install, maintain, and remove temporary partitions per the contract documents. Contractor shall reference the G, AD, & A-series drawings for specific requirements. Reference temporary partition detail on AD101A. Contractor shall include temporary operable, lockable doors at these partitions. At locations where interior side of temp. partition is exposed to existing facility, contractor shall install 5/8” sheetrock, no finish required.

2.2.12. Contractor shall furnish, install, maintain and remove roof safety lines 15’ back from the edge of the roof. Contractor to install roof safety line immediately after BP 03 Contractor turns over access to the roof deck. This includes wood rail cattle shoots at the roof access point.

2.2.13. Contractor is responsible for providing access for a material landing zone at the roof. Contractor includes a guardrail/cattle chute setup and means for tie-off so individuals can tie off a minimum of 15ft back from the leading edge.

2.2.14. Contractor shall provide an allowance of $45,000 for miscellaneous construction support beyond the requirements of this scope. Contractor to provide written notice prior to usage of allowance. All expenditures to be tracked on daily tickets and signed by CM. Unused allowance to be credited back to project.

2.3. Demo & Relocation

2.3.1. Contractor shall be responsible for demolition of all building components as shown per the contract documents unless noted otherwise or listed as an exclusion. This includes complete removal and disposal as well as removal of materials or components to be salvaged & re-installed. Contractor is responsible for storage & protection of salvaged components until schedule allows for re-installation. Contractor understands that storage of any salvaged materials may require off-site storage.

2.3.2. Contractor to coordinate all demolition with Construction Manager and Owner as to minimize disruption to building occupants.

2.3.3. Contractor shall be responsible for protection of existing building elements to remain.

2.3.4. Contractor shall sequence any demo scope of exterior components of existing building in conjunction with the construction of temporary partitions in order to maintain a weatherproof and watertight exterior.

2.4. Rough & Finish Carpentry

2.4.1. Contractor shall furnish and install any/all rough carpentry and finish carpentry as required by the Contract Documents. Contractor includes all incidentals and accessories for a complete installation.

2.4.2. Contractor includes all required fasteners, shims, blocking and components that may be required for a full installation. Contractor includes anchoring to steel where noted.

2.4.3. Contractor includes all exterior and interior blocking and backing as shown in the contract documents. This includes blocking and backing for items to be installed by other Prime Contractors even if not shown on the contract documents. Those Prime Contractors to provide layout drawings/information for scope that requires blocking and or backing. This includes blocking as needed for Owner furnished items.

2.4.4. Contractor includes plywood at all communication and electrical rooms as required by the Contract Documents.

2.4.5. Contractor shall furnish and install any/all cabinets and countertops, including plywood subtops, brackets and grommets.

2.4.6. Contractor shall furnish and install any/all wood paneling, wood caps, wood shelves and wood base, including all accessories for a complete installation including but not limited to clips, trim, transitions, fasteners and sealant.

2.4.7. Contractor shall furnish and install any/all solid surface and quartz material per the contract documents.

2.4.8. Contractor shall furnish and install all plastic laminate material per the contract documents.

2.4.9. Contractor shall furnish and install any all millwork knee walls. This includes any included ballistic sheathing & wallboard, see 06 20 00 for further information.

2.4.10. Contractor shall furnish and install any/all steel supports for countertops and millwork.

2.4.11. Contractor shall furnish and install custom benches with upholstered cushions per the contract documents. See A1 / A520 for example. This includes but is not limited to associated framing, plywood, fasteners, and clips as required for a complete installation

2.4.12. Contractor is responsible for cut-outs in countertops. Templates furnished by other trades. Coordinate layout with trade requiring cutout.

2.4.13. Contractor includes field scribing of countertops to match minor wall irregularities.

2.5. Joint Sealants, Preformed Joint Seals, and Expansion Joint Covers

2.5.1. Contractor shall furnish and install all required sealants and joint backing at work installed by this Contractor. This includes where materials installed under this scope interface with materials of other Contractor's work already in place.

2.5.2. Contractor specifically includes sealant at these locations. Reference the joint sealant matrix listed under section 2.1.2, as well as the following to supplement that list:

2.5.2.1. Any/all slab on grade/stoop joint sealants including but not limited to; concrete slab-on-grade control joints at all exposed concrete locations and concrete expansion joints. Contractor shall clean joints and remove all debris prior to installation.

2.5.2.2. Any/all countertops, backsplashes and casework to adjacent wall whether shown on Contract Documents or not.

2.5.2.3. Any/all fire extinguisher cabinets and toilet accessories to adjacent wall whether shown on Contract Documents or not.

2.5.2.4. Color matched sealant between bottom of hollow metal frames and flooring. Assume ½" gap due to slab inconsistencies.

2.5.2.5. Include caulking gypsum to all adjacent materials whether shown or not.

2.5.2.6. Steel bollard/post to floor

2.5.3. Contractor shall confirm that sealants are compatible with each substrate on which they are installed.

2.5.4. Contractor shall furnish and install any / all preformed joint seals and expansion joint covers, except EJ-8 at the roof. Contractor shall coordinate with other scopes as necessary to ensure sequencing and blockout are as necessary.

2.5.5. Contractor includes any / all incidentals for a complete preformed joint seal and expansion joint cover assembly. This includes but is not limited to blockouts, grout/infill, fasteners, field measurements (as required), joint sealants, etc.

2.6. Doors, Frames and Hardware

2.6.1. Contractor shall furnish and install any/all hollow metal and stainless steel doors and frames as required by the Contract Documents. This includes radiation protection frames as required.

2.6.2. Contractor shall furnish and install any/all wood doors as required by the Contract Documents.

2.6.3. Contractor shall furnish and install any/all door hardware as required by the Contract Documents. Door hardware for the aluminum doors shall be furnished and installed by others.

2.6.4. Contractor includes any door hardware replacements & prep at existing hollow metal, stainless steel, and wood doors & frames as shown on the contract documents.

2.6.5. Contractor shall furnish and install any/all welded frame closure plates. Contractor shall field weld, bondo and sand smooth.

2.6.6. Contractor shall grout, insulate or install other material as required by the Contract Documents within the hollow metal frames.
2.6.7. Contractor includes prepping all frames and doors for specified door hardware. Contractor to coordinate with other Prime Contractors as needed.
2.6.8. Contractor shall furnish and install temporary construction cores for all exterior doors and for electrical rooms.
2.6.9. Contractor shall furnish and install all overhead coiling doors per Contract Documents, including but not limited to; tracks, doors, operating hardware and equipment, galvanized pipe at slab, door slats, hinge and roller assemblies, lift mechanisms, weather-stripping, locks, lock cylinders, counterbalances, safety accessories and all miscellaneous components required for a complete assembly.
2.6.10. Contractor shall furnish and install any/all steel plates at the overhead coiling doors.
2.6.11. Contractor shall provide startup and testing at overhead coiling doors as required by contract documents.
2.6.12. Contractor understands that all low voltage & controls pathways, wiring, terminations, power hookup and any door security pathways & wiring will be by BP 26. This Contractor shall provide specific locations for such power to be terminated or install overhead doors to coordinate with locations shown on electrical drawings.

2.7. Ceramic Tile

2.7.1. Contractor shall furnish and install all tile and accessories as required by the Contract Documents. This includes, but is not limited to tile, waterproofing membranes, control/expansion joints, transitions, metal trim, adhesives, mortar, grout, penetrating sealer, crack isolation membrane, and sealants as required for a complete installation. Washouts and tile-saw locations shall be coordinated with the Construction Manager so as not to damage finishes already in place.
2.7.2. Contractor shall include furnish and install of waterproofing membrane & shower pan leveling support underneath shower pan. See A18 / A630 for example.
2.7.3. Contractor shall furnish and install control/expansion joints and sealants as required by the Contract Documents.
2.7.4. All required surface preparation including minor fill is to be completed by this contractor.
2.7.5. Clean all surfaces so they are free of foreign matter.

2.8. Resilient and Carpet Flooring, Fluid Applied Flooring

2.8.1. Contractor shall furnish and install resilient flooring, base, stair nosing, floor transitions and accessories as required by the Contract Documents. This scope includes minor floor patching and floating. Any conditions believed to require more than minor preparation shall be noted in writing to the Construction Manager for evaluation. Clean substrate prior to installation.
2.8.2. Contractor shall furnish and install all tile carpeting and walk off matting as required by the Contract Documents. This scope includes minor floor patching and floating. Any conditions believed to require more than minor preparation shall be noted in writing to the Construction Manager for evaluation. Clean substrate prior to installation.

2.8.3. Verify concrete surfaces to receive flooring meet/exceed flatness/levelness as specified, report, in writing, all results to Construction Manager.
2.8.4. Verify concrete surfaces to receive flooring meet/exceed moisture levels and alkalinity (pH) as specified, report in writing, all results to Construction Manager.
2.8.5. Clean all surfaces so they are free of foreign matter.
2.8.6. All required surface preparation is to be completed by this contractor.
2.8.7. Contractor shall furnish and install any/all fluid-applied flooring including but not limited to; primer, basecoat, finish coat, epoxy, texturing, integral cove base, transitional material, and any/all miscellaneous components required for a complete assembly.
2.8.8. Contractor shall furnish and install any/all fluid-applied flooring including but not limited to; primer, basecoat, finish coat, epoxy, texturing, integral cove base, transitional material, and any/all miscellaneous components required for a complete assembly.
2.8.9. Contractor is responsible for coordinating power requirements for any equipment with the BP 26 contractor if necessary.
2.8.10. Contractor shall provide reasonable blockage, signage, and/or flagging to quarantine flooring installation areas against damage until product is cured and able to accept traffic.
2.8.11. Contractor shall furnish and install any/all flooring transitions per the contract documents, except for transitions between this scope and terrazzo flooring. This includes transitions between flooring installed by this scope and existing materials/flooring.

2.9. Specialties, Equipment, Signage, & Misc.

2.9.1. Contractor to furnish and install specialties per the contract documents, including but not limited to visual display units, plastic toilet partitions, wall and door protection, toilet, bath, and laundry accessories, fire protection specialties, metal lockers, closet and utility shelving, and solid surface benches (including ADA style). Contractor includes all accessories for a complete installation.
2.9.2. Include all required structural support and backing for specialties and other components described within this section.
2.9.3. Contractor shall include any/all trim or transitions that interface with items listed in this scope of work. See TRS-2 trim on 6 / A630 for example.
2.9.4. Contractor shall have all fire extinguishers inspected and tagged.
2.9.5. Contractor to install all owner furnished appliances & toilet accessories. Mechanical Contractor & Electrical Contractor are responsible for performing the needed plumbing, mechanical and electrical hook-ups.
2.9.6. Contractor shall furnish and install corner guards and wall guards per the contract documents.
2.9.7. Contractor shall furnish and install dimensional letter signage and panel signage per the contract documents. This includes all components required for a complete installations which include but are not limited to graphics, text, braille text, plates, adhesives, fasteners, anchors, bolts and nut, and other hardware.

2.9.8. Subcontractor shall examine all surfaces to assure they are dry, clean, of uniform texture, and free of bond-inhibiting substances or conditions that may conflict with adhesion, protective properties, or appearance.

2.9.9. Contractor shall furnish and install loading dock bumpers and stationary loading dock equipment per the contract documents.

2.9.10. Contractor shall furnish and install standardized, prefabricated loading dock pit frame at each loading dock leveler location. This frame shall be compatible with loading dock leveler provided through this scope.

2.9.11. This Contractor shall coordinate with Concrete Contractor to ensure formwork, blockouts, embeds, etc are installed as required to facilitate installation of loading dock equipment.

2.9.12. Contractor shall furnish and install knox box. This includes footing, & structure.

2.9.13. Contractor shall furnish and install any monitors per the contract documents. Contractor shall install any monitors called out at OFCI per the contract documents.

2.10. Lab Scope

2.10.1. Contractor shall furnish and install any/all components of the lab scope labeled as Contractor Furnished Contractor Installed (CFCI) per the contract documents, except items specifically called out to be by divisions 22, 23, 26. This includes but is not limited to:

2.10.1.1. Lab mobile tables
2.10.1.2. Laboratory casework, countertops and associated support
2.10.1.3. Lab accessories
2.10.1.4. General lab equipment and lab fixtures
2.10.1.5. Autopsy & morgue equipment
2.10.1.6. Laboratory Fume Hoods
2.10.1.7. Structural autopsy station support
2.10.1.8. 3x3 wheel stop angle
2.10.1.9. Wall protection
2.10.1.10. Removeable stainless steel funnels at condensate drain box

2.10.2. Contractor shall install all items, components, equipment labeled as Owner Furnished Contractor Installed (OFCI) per the contract documents unless specifically noted to be installed by division 22, 23, or 26.

2.10.3. Contractor shall be responsible to remove & relocate/re-install all lab items, components and equipment except items specifically called out to be done by Owner or divisions 22, 23, 26 per the contract documents. Reference G100 and L-series drawings for examples.

2.10.4. Contractor shall coordinate with other trades, i.e. mechanical, electrical, plumbing, for removal & installation of any item or equipment through this scope of work that interface with others' scope of work or require connection or disconnection by others.

2.10.5. Contractor shall furnish and install cold rooms per the contract documents. This includes a complete system including but not limited to insulated panels, refrigeration system, controls, condensing units & curbs, evaporator coils, desiccant dryers, sliding doors, wall

protectors, corner guards, cove, lighting, and any electrical work outside of power connections to equipment. This includes retrofitting of existing cool room per the contract documents.

2.11. Window Shades

2.11.1. Contractor shall furnish and install any/all window shades per the contract documents. Contractor includes all incidentals and accessories for a complete installation.
2.11.2. Contractor shall coordinate with BP 9 – Electrical and BP 10 – Audio/Visual on integration of roller shade system with electrical, lighting control and AV systems. Final electrical connections are by others.
2.11.3. Contractor includes programming and commissioning of the motorized roller shades.

2.12. Construction/Final Cleaning

2.12.1. Contractor shall provide final cleaning of the building interior at each phase.
2.12.2. Contractor shall clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program.
2.12.3. Contractor to wipe down all surfaces needing cleaning including, but not limited to plumbing fixtures, light fixtures, partitions, casework, countertops, millwork, exposed steel, exposed ductwork, exposed piping, etc.
2.12.4. Contractor to clean interior glass and all mirrors with glass cleaning agent. This includes cleaning the inside surface of all windows and aluminum framing. Curtainwall Contractor will clean the outside surface.
2.12.5. Contractor to use cleaning agents that are not harmful to material to be cleaned.
2.12.6. Contractor shall initially clean the building in its entirety as listed above to be presentable for project punch-list walk w/ the owner & architect.
2.12.7. Contractor shall clean building in its entirety to be accepted and functional for owner and employee occupancy. This is a secondary cleaning trip for each phase. This clean will specifically target areas that have been made dirty by construction activities addressed after the punch-list walk.

Section 3. Contract Exclusions

The Contractor's Work specifically excludes the following:

3.1. General Construction Waste Dumpsters
3.2. Sitework demolition
3.3. Division 22, 23, and 26 demolition
3.4. Concrete demolition specifically required for routing of pipe, conduit, duct, etc. by division 22, 23, or 26 scope of work
3.5. Roof membrane & insulation demolition
3.6. Exterior hollow metal framing and glazing
3.7. Existing skylight demolition
3.8. Bullet resistant transaction window removal/reinstallation
3.9. Installation of cooler room condensers & curbs

3.10. Coiling door low voltage and power pathways and hookup
3.11. Temporary fire extinguishers during construction

Section 4. Contract Time

The Contractor's Work shall be completed as follows:

4.1. Contractor agrees to meet or exceed durations and sequences as outlined in the Milestone Construction Schedule (included in this specification section), and as modified from time to time during the course of the project and as communicated through regularly scheduled progress meetings. Increased manpower or overtime required to meet these obligations shall be borne by this Contractor.
4.2. Acceptance of Revised Master Construction Schedules - After each LEAN Last Planner pull session, the Construction Manager will compile the pulled activities and notify Contractors of the updated Master Construction Schedule. Within 48 hours of issuance by the Construction Manager, Contractors must accept or dispute the revised Master Construction Schedule. If any Contractor disputes the new handoff dates, disputing contractors will have an opportunity to re-pull their activities. All contractors will be held to the last fully accepted Master Construction Schedule.
4.3. Contractor shall provide sufficient labor, material, and equipment to maintain or improve upon the construction schedule.
4.4. Contractor shall assume working a standard forty-hour work week based on five (5) eight (8) hour days (Monday thru Friday).
4.5. Contractor shall provide the Construction Manager written notice 48 hours in advance of request to work additional hours during the week or on the weekend and is subject to Construction Manager's approval.
4.6. The Contractor understands that there will be concurrent work activities taking place that may require additional supervision, manpower, and equipment or material deliveries to accommodate the schedule needs.
4.7. Contractor agrees to mobilize on the scheduled start date and continue without pause, hesitation or interruption provided there is not impedance by others to his work.
4.8. Contractor understands that this project will require multiple mobilizations in order to complete their scope(s) of work due to project phasing, sequencing, as well as existing building operations needing to remain unaffected. Refer to G-series phasing & site logistics drawings for further information regarding project phasing.

Section 5. VDC/BIM Coordination

5.1. The Construction Manager shall lead the 3D Computer Model Coordination process. The Construction Manager will require coordination drawings and a 3D Model for the following trades: Steel (Bid Package 005A), Fire Protection (Bid Package 021A), Mechanical Ductwork, Piping and Equipment (Bid Package 0022A), and Electrical Piping & Equipment (Bid Package 026A). See 3D Coordination Drawing Matrix for further detail.
5.2. The coordination drawings shall be produced in three dimensional CAD, Revit, Archicad, or other 3D modeling software that allows for exporting, save as, or native import into Autodesk

Navisworks for 3D model management. Coordination Drawings shall also be exported as 2D installation drawings and submitted to the Construction Manager.

5.3. The Construction Manager shall provide a Coordinated Computer Model in a Navisworks NWD file on a periodic basis and will be used for Contractors to reference and make corrections to each respective trade model until all conflicts are resolved.

5.4. Model Coordination Meetings shall be held at regular intervals to execute the process. The Construction Manager will lead model management efforts and will require the Contractors with model assignments to attend several meetings to assign special parameters of each trade prior to final approval of coordination drawings. The initial model coordination meeting will be to develop the file naming, origin coordination, and software file testing prior to 3D model and drawing conception. The coordination schedule and clash resolution priorities will also be reviewed and established. Contractors should allow for a model coordination meeting once a week until the process is complete. The coordination meetings shall be attended by each Contractor that is required to build a 3D Model. Each representative must have decision making authority and first-hand knowledge of what has been modeled and be prepared to resolve conflicts based on what is discussed in the coordination meeting.

5.5. Contractor understands that the expectation is VDC Modeling of new construction and construction in existing building at new ceiling & grid/framing work locations and MEP work showing tie-ins to existing systems. VDC Modeling also required for new systems below existing slab or in existing walls. Contractor shall field verify for their scope of work as early as possible without causing destructive demolition to the existing building.

3D Coordination Drawing Matrix

Description	Responsible Party	Level of Development (Defined by AIA E202)	Additional Requirements:
Architectural			
Foundations & Structural Concrete	Design Professional	300	
SOG	Design Professional	300	
Interior Walls	Design Professional	200	
Ceilings	Bid Package 022A	200	*Allows for better ceiling coordinattion
Metals			
Structural Steel	Bid Package 005A	400	

Misc Steel	Bid Package 005A	400	
Steel Joist	Bid Package 005A	400	
Steel Deck	Bid Package 005A	300	
Precast			
Walls	Not Applicable	400	*Includes all embeds and connection
Fire Sprinkler			
Piping Assemblies	Bid Package 021A	400	*Pumps, Tampers, Flows, Valves, etc.
Main Piping	Bid Package 021A	400	*Include hangers. All size piping.
Branch Piping	Bid Package 021A	400	*Include hangers. All size piping.
Drop Piping and Heads	Bid Package 021A	400	*All size piping.
Plumbing			
Underslab Piping	Bid Package 022A	400	*Includes from 5-0 outside of building.
Above Ground Piping	Bid Package 022A	400	*1/2" diameter and larger piping only.
Equipment	Bid Package 022A	400	All equipment
Mechanical			
Ductwork	Bid Package 022A	400	*All sizes.
Mechanical Piping	Bid Package 022A	400	*1/2" diameter and larger piping only. Includes hangers.

Equipment	Bid Package 022A	400	All equipment. Include clearance zones.
Electrical			
Underslab Conduits	Bid Package 026A	300	*1" diameter conduit, raceway, and larger. Show intended trenches.
Conduit, Raceways	Bid Package 026A	300	*1" diameter conduit, raceway, and larger. Includes cable tray.
Equipment and Panels	Bid Package 026A	300	*All panels, all sizes. Panel labels/names. Include code/service space requirements above and in front.
Light Fixtures	Bid Package 026A	300	Include install clearance.

Section 6. Jobsite

6.1. Nothing Hits The Floor

6.1.1. Contractor shall conform to Construction Manager's Nothing Hits the Floor Program. Placing material, tools, or debris on the floor or ground is prohibited.

6.1.2. Contractor shall provide rolling carts, debris containers or other means of collecting scrap material/trash at Contractor's work areas. Scrap material shall be promptly placed into containers when produced. Contractor shall remove its debris at least daily to dumpsters provided by others. When debris containers are shared amongst multiple Contractors, each Contractor shares an equal part in the responsibility of getting debris containers dumped into the dumpsters.

6.1.3. Contractor shall establish work/cutting stations at waist height in order to eliminate bending and or squatting down when cutting material. Cutting of material at ground level is prohibited.

6.1.4. Contractor agrees to use battery-operated tools wherever and whenever possible. If cordless tools cannot be utilized, all cords and hoses shall be elevated from the point they leave an outlet to the point of use. Contractor shall supply cord trees and S hooks as needed for equipment cords.

6.1.5. Contractor is responsible for all labor and equipment to unload, account for all material delivered, stock, and delivery for this scope of work. Materials to be installed will be delivered "just in time" to reduce the amount of material stored on the project site. Materials delivered and moved into the building shall be used within 3 work days unless otherwise authorized by Construction Manager. If anything stored obstructs the progress of any portion of the work, it shall be promptly removed or relocated by the Contractor without reimbursement. Attic stock shall be held at Contractor's storage until the end of project or approved by the Construction Manager.

6.1.6. At no time shall materials be stored directly on the floor or ground. All material at the Project shall be stored in trailers, wheeled carts, storage racks, storage bins, or on pallets. When wheeled carts are used, the casters shall be lockable. Materials shall only be stored on pallets or storage bins on level surfaces where they are accessible with a pallet jack.

6.2. Drug Free Verification Policy

Contractor agrees to be bound to, and comply with, the Construction Manager's Drug-Free Verification Policy. Contractors will provide only trades people who have given prior consent to submit to a drug test. The Construction Manager retains the right, but not the obligation, to require the Contractor's employees to be tested to insure that they are drug free. Contractor's employees may be included in jobsite testing at the option of the Construction Manager. The Contractor will pay the cost of such drug testing.

6.3. Clean Up

6.3.1. The Contractor shall, on an on-going basis or at the direction of the Construction Manager, keep the Project site and surrounding area free from accumulation of waste materials, debris or rubbish caused by performance of the Contractor's Work.

6.3.2. If such clean-up is not properly or timely performed, Construction Manager shall give Contractor's representative a written notice to comply within 24 hours from the time notice is given. If Contractor fails to correct such noncompliance within said 24 hours, Construction Manager is authorized to perform the clean up and to assess Contractor a reasonable charge. Contractor also agrees to accept pro-rata responsibility for clean up of unclean conditions which Construction Manager is unable to identify to a particular Contractor. The Contract Sum will be reduced for Construction Manager's clean up costs.

6.3.3. Contractor shall cleanup and haul off to dumpster provided by others for all debris resulting from Contractor's scope of work. Contractor shall provide brooms, shovels and other equipment for Contractor's own clean-up.

6.3.4. In addition to the general clean up in paragraph above, Contractor shall furnish one laborer for each six (6) employees working on site the preceding four work days for clean up of general trash and debris. The Construction Manager shall supervise this clean up crew. If Contractor fails to comply with this clean up policy, Construction Manager shall reduce the Contract Sum in the amount of $100 per man hour for such non-participation in the weekly clean up effort.

6.3.5. Contractor shall take all necessary measures to prevent tracking of mud onto surrounding streets and driveways. Include street cleaning and/or sweeping necessitated by this scope and comply with all local codes.

6.4. Protection

6.4.1. Protect adjacent existing building elements from damage from Scope of work. Repair existing building elements damaged during Contractor's Scope of work.

6.5. Hoisting

Contractor is responsible for all hoisting facilities for Contractor's material, equipment and personnel to complete the work.

Section 7. Safety

7.1 **Safety Precautions**

The Contractor shall take all necessary safety precautions with respect to performance of the Contractor's Work and shall comply with applicable safety measures and with the applicable laws, ordinances, rules, regulations, and orders of public authorities and with the requirements of the Contract Documents for the safety of persons and property. The Contractor agrees to participate in periodic site safety meetings as requested by Construction Manager, including weekly "toolbox talks". The Contractor shall comply with all Project Safety Requirements listed in this section.

7.2 **Safety Protections**

The Contractor and its employees must, at a minimum, comply with all applicable laws, codes, rules, regulations and requirements pertaining to the safe performance of its Work, including the Federal Occupational Safety and Health Act (OSHA). Contractor agrees to provide protection as is necessary to protect all persons and property from Contractor's operations. Contractor shall effectively secure and protect the Contractor's Work. The Contractor shall furnish all safety equipment required to safely perform the Contractor's Work.

7.3 **Assumption of Safety Responsibility**

The Contractor agrees and acknowledges that it has assumed full responsibility and liability for safety precautions in connection with the construction means, methods, techniques, sequences, supervision and procedures pertaining to Contractor's Work.

7.4 **Safety Requirements**

The following minimum safety requirements are also applicable and will be enforced on this Project. Specific questions regarding these safety requirements should be directed to the Construction Manager.

7.4.1 ***Unsafe Conditions***

BE ALERT! All un-safe conditions shall be reported immediately to the Construction Manager's Project supervision and to the Contractor's Project Site Supervisor. No person is required to work under any unsafe conditions. OSHA Standard 1926.20.

7.4.2 ***Reporting Injuries***

All accidents or injuries deemed Recordable, Lost Time or Restricted by OSHA, or non-injury incidents resulting in property damage or high potential for severe injury shall be reported immediately to the Construction Manager's Superintendent, giving full details and identifications and statements of any witnesses. The Contractor shall be responsible for completing a written injury and/or incident investigation in accordance with referenced procedures and providing such report to the Construction Manager's supervision in a timely manner.

7.4.3 ***Project Safety Officer***

The Construction Manager's personnel have the authority to remove any of the Contractor's unsafe equipment, tools, scaffolding or other unsafe items, and have the authority to remove any Contractor employees that do not comply with these safety requirements. Contractors that receive two (2) written notices on the Project from the Construction Manager for failure to follow OSHA safety standards or these safety requirements, may have their payment withheld until such time as the managing principal of the Contractor has met with the Construction Manager and agreed on a plan to eliminate future safety violations. Continuing violations of these safety requirements may also result in termination of the Contractor's continuing performance under this Agreement.

7.4.4 ***Fall Protection***

All work performed at elevations over 6 feet must have a 100 percent fall protection or prevention system. This includes, but is not limited to; all leading edge work, iron connecting, working off of elevated work platforms (scaffoldings), and residential type construction. Only methods referenced and meeting or exceeding OSHA Standard 1926 Subpart M shall be used.

"Monitors" or "safety zones" are NOT an acceptable means of fall protection unless other positive protection methods create a demonstrated greater hazard. The Contractor's use of "monitors" or "safety zones" requires the prior written consent of the Construction Manager and must, at a minimum, meet OSHA requirements. Safety monitors and other "non-positive" means of fall protection and prevention can only be used when a written Project Specific Fall Protection Plan is submitted to and approved in writing by the Construction Manager. The Contractor's written Fall Protection Plan

must meet all OSHA requirements and provide the most effective employee protection possible. The Contractor is responsible for enforcement of its fall protection plan.

Where no identifiable tie off point is identifiable on the roof, Contractor shall provide roof cart or equivalent to complete Contractor's work.

7.4.5 ***Barricades***

Barricades or covers meeting OSHA Standards are required around excavations, holes or openings in floors or roofs, edges of roofs, elevated platforms, around certain types of overhead work and whenever necessary to warn or prevent persons or equipment from falling.

7.4.6 ***GFCI Protection***

All work using cords or power tools must utilize Ground Fault Circuit Interrupter (GFCI) protection. Only authorized electricians shall perform electrical work.

7.4.7 ***Excavations***

Excavations must be sloped, shored or shielded, and must meet all other OSHA requirements. Before digging in any location, the Contractor must check to ensure that all public & private underground utilities have been located and properly marked.

Contractor shall hydro-vac to confirm utility location if digging within 5 feet of marked utility. Hydro-vacing will then be required every 20' if digging alongside existing utilities, prior to digging with equipment.

When excavation is to occur within an existing building or similar location, Ground Penetrating Radar (or similar) shall be used to scan under slab on grade conditions for potential underground utilities.

Contractor shall complete a Ground Disturbance Permit for any operation that creates any man-made penetration, cut, cavity, trench, or depression formed by earth removal regardless of depth.

7.4.8 ***Lockout/Tag***

Contractor's employees shall comply with OSHA Standard 1910.147 lockout/tag procedures when working on energized systems or equipment. The Contractor may utilize Construction Manager's lockout/tag procedures. Contractor shall utilize the Daily Electrical Checklist anytime that lockout/tagout conditions change.

7.4.9 ***Personal Protective Equipment***

7.4.9.1 All of the Contractor's employees on the Project site must use proper personal protective equipment (PPE) and clothing suited to the Work and the Work environment. The Contractor is responsible for providing its personnel the proper PPE which includes; gloves where applicable; no dangling or loose clothing or jewelry may be worn around moving machinery; shirts which cover the shoulder, work boots or shoes, high visibility shirt/vest, and long pants are required; hardhats must be worn by all workers, supervisors, clients, visitors and vendors at all times;

eye and face protection (meeting ANSI Z87.1-1989 standards) must be worn at all times on the Project site. Additional forms of eye protection may also be required as prescribed by OSHA standards and manufacturer recommendations. Steps must be taken to protect other workers and the public from eye injury whenever tasks producing flying chips or particles are being performed; respirators will be used when an employee is exposed to airborne hazards (proper training, physical exam and a fit test are required; 1910.134); hearing protection in the form of earmuffs or approved ear plugs shall be worn on all high noise level jobs as required; no radios will be allowed on the Project site other than 2-way radios for jobsite communication; and Contractor shall maintain appropriate first aid equipment and supplies in its Work areas at all times.

7.4.9.2 Contractor will provide ANSI cut 4 or higher gloves to their employees and ensure all subtiers are provided with the same. Gloves are required to be worn at all times.

7.4.9.3 Contractor employees and visitors who will be on site will be required to wear an ANSI Type II or an EN12492 helmet (i.e., a safety helmet that meets the requirements of testing against vertical, front, back, and side impacts and penetration) with an integrated four-point chin strap tightly attached and secured under the chin with no more than a 2-finger gap between strap and chin

7.4.10 ***Housekeeping***

Contractor shall maintain good housekeeping in and around its Work areas at all times. Stack materials so that safe clearances are maintained and falling is prevented. Keep all walk ways and aisles clear. Place cords and air hoses to one side (elevated) to allow safe passage. Remove loose overhead material, dispose of garbage. Immediately remove oil and water spillage. Immediately remove or bend over nails protruding from lumber. Secure all stored or loose materials (especially on roof) to prevent it from becoming airborne.

7.4.11 ***Illumination***

All of Contractor's Work areas shall be properly illuminated at all times.

7.4.12 ***Ventilation***

All of Contractor's employees performing confined space work shall be properly trained. All necessary requirements contained in OSHA Standard1910.146 must be met. Contractor shall maintain proper ventilation in enclosed areas when using equipment.

7.4.13 ***Ladders***

Contractor shall train its employees in the safe use of ladders and scaffolding as required. Defective ladders and scaffold components shall be tagged and removed from service

7.4.14 ***Tools and Equipment***

Tools, equipment, trucks, loaders, backhoes, cranes and forklifts shall be used, operated and maintained properly to prevent injury. No Contractor employee shall operate any equipment unless specifically authorized and trained to do so. Powder-actuated tools

require certified training before use. Power tools shall be operated only by authorized personnel and with guard's in-place. Hand tools such as hammers and chisels shall be properly used and maintained. All slings, choker and rigging equipment shall be free of defects. All hooks must have safety latches or keepers. Taglines shall be used to control loads when their use does not create an additional hazard. Tampering with or unauthorized use or removal of fire extinguishers from assigned locations is prohibited. All of Contractor's tools and equipment must be inspected daily by Contractor before use. Damaged tools shall be tagged "DO NOT USE" and removed from service immediately. Documentation of training and inspections shall be provided to the Construction Manager upon request.

7.4.15 ***Safety Plan***

A written Project specific safety plan and/or a Job Safety Analysis shall be completed. Such plans shall be completed and provided to the Construction Manager at least (2) weeks before the work begins.

7.4.16 ***Toolbox Talk***

Attendance at weekly Tool Box Talks is required for all Contractor personnel and documentation of meetings is mandatory. The Contractor shall ensure that its personnel watch Construction Manager's Safety Introduction as required by the Construction Manager prior to performing work on site.

7.4.17 ***Hazard Communication***

If Contractor or its Contractors bring any material to the Project site which requires notification to employees of the Contractor, Owner or its other contractors, suppliers, vendors, material men and/or local fire departments or other authorities, in conformance with applicable environmental, hazardous substance, right to know, or similar laws, the Construction Manager shall be provided with material safety data sheets to be available at the Project site for inspection and reference prior to delivery of such products or materials to the job-site. Contractor shall provide appropriate training for its job-site personnel. The Contractor shall maintain a hazardous material program, including proper placarding of all locations where hazardous materials are located, in conformance with the aforementioned laws.

7.4.18 ***Unsafe Acts***

Contractor's employees who report for work under the influence of intoxicants or narcotics or engage in the consumption of them on the Project site will be removed from the Project site. Contractor's employees who engage in horseplay, fistfights, unsafe acts, whistling, yelling at the public or obscene gestures will be removed from the Project site. Weapons of all types, including firearms, are strictly forbidden on the Project site.

7.4.19 ***Visitors***

All of Contractor's visitors to the Project site must check in with the Construction Manager's supervision prior to going on site.

7.4.20 ***Competent Person***

The Contractor shall identify their OSHA Competent Person for the work that they perform in either their written safety plan or in a memo form submitted at the beginning of work.

7.4.21 ***Project Site Communications***

Contractor shall have on site at all times a supervisor (or multiple supervisors if required by crew size) that is able to speak, understand and communicate in English all job site safety and contractual requirements, obligations and responsibilities to Contractor's workers and employees. Contractor shall require its' lower tier Contractors and suppliers to comply with this requirement and shall incorporate this section in its agreement with lower tier Contractors and suppliers.

7.4.22 ***Consent to Use of Drones***

Contractor and its employees consent to the use of an unmanned aerial system (UAS) at the Project site if approved by Construction Manager, and specifically to any UAS flyovers.

7.4.23 ***Hot Work Operations***

Hot work operations require the use of a permit.

Combustible Material: All portable combustible material must be removed a minimum of 20 feet away from the working area and adjoining areas.

Flammable Liquids or Vapors: Drums, tanks or other containers or explosive liquids or vapors must be cleaned and cleared of flammable or explosive liquids or vapors before work is done on them.

Pre-Operation Precautions: When feasible, work area should be wetted down.

Spark Control: Sheet metal guards, asbestos and similar protection must be provided to prevent hot metal and sparks from falling on combustible material which cannot be moved.

Fire Protection: If the area in which hot work operations are being performed is presently under operative sprinkler protection, the sprinklers in that area must be operative during welding or cutting operations. Suitable fire extinguishers or hand hose must be maintained near the operations. An extra person must be provided in the welding or cutting team whose sole responsibility is to watch for sparks and promptly use the extinguishing equipment.

Post-Operation Precautions: After work, a thorough check must be made for smoldering fire in out-of-the-way places, and guard patrol protection must be maintained for a minimum for one hour.

"Hot Work Operations" means:

The process whereby one or more of the parts to be joined is heated near of above its melting point, and the heated surfaces are caused to flow together.

The process of applying heat to bring to red heat the spot to be severed, gouged or pierced, and the metal is burned in a jet of oxygen;

Grinding operations that generate sparks;

Torch-on roofing operations;

Roof tarring operations.

7.4.24 ***Daily Stretch & Flex***

Contractor and its on-site crew (including sub-tier Contractors) will attend a daily stretch and flex to start each work day. All workers will meet at a central location on site for stretching and to review site logistics and/or other safety topics. Stretch and Flex will last for approximately 15 minutes. Construction Manager will facilitate the daily stretch and flex.

7.4.25 ***Daily JSA***

Contractor is responsible for pre-task planning, including filling out a daily Job Safety Analysis (JSA). The daily JSA is to be filled out each morning and reviewed with the Contractor's crew prior to the crew starting work. Contractor shall fill out additional JSA's during the day when conditions or tasks change. Contractor's foreman shall review the JSA each morning with the crew and obtain signatures. Contractor's foreman to keep JSA's clean and organized in Contractor's trailer or gang box. Construction Manager will review the daily JSA's with the foreman on a periodic basis.

7.4.26 ***Ladders Last Program***

Contractor shall comply with Construction Manager's Ladders Last program. This specifically includes all costs to furnish lifts/scaffolding, etc. as required to meet the program requirements.

Ladders are to be the last choice for accessing elevated work areas. Alternative means of access shall be used whenever feasible. Alternate means of access may include:

- Scissors life
- Aerial lift
- Scaffolding (Baker, Perry or other rolling scaffold)
- Rolling stairs
- Stair towers

Extension ladders may be set up in one location and used for access between elevations for a period of no more than one week. If long term access is required (more than one week), a stair tower, stairway or personnel hoist shall be utilized.

At no time will work be performed from an extension ladder without a permit. The cost of alternate means of accessing the work area is not to be a factor when determining whether to issue a permit for working from an extension ladder. 100% fall protection is required if work is to be performed at height of 6’ or more from an extension ladder.

Step ladders 8’ or less are allowed to be used without a permit.

When step ladders are used, platform style step ladders are the preferred ladder.

The ladder use permit must be completed and approved by the project team for requests to use step ladders greater than 8’ in height or extension ladders for a duration of greater than one week.

The ladder Permit will be affixed to all ladders while in use. The inspection safety checklist (on the back of the permit) will be completed prior to use. The ladder and safety inspection checklist will be completed by a competent person.

7.4.27 ***Prime Contractor Executive Engagement***

Each month a Prime Contractor Executive will be asked to attend the morning stretch and flex, address the jobsite workers with a safety message and conduct a jobsite walk. This responsibility will rotate through the Prime Contractors on the project. The Construction Manager will coordinate with the Prime Contractors to set up a rotation.

7.4.28 ***Behavior Based Safety***

Contractor agrees to participate in the project Behavior Based Safety program that includes training and observations

7.4.29 ***Safety Meetings – Level 1, 2 and 3***

Contractor shall participate in Level 1, 2 and 3 safety meetings. Level 1 meetings are the standard preconstruction meetings. Level 2 meetings are only required if/when during the Level 1 meeting a scope of work is identified to have a High Risk Activity (HRA) associated with it. Level 2 meetings will be held two weeks prior to the scope of work beginning. Contractor will be required to develop a Method of Procedure (MOP) and Sequence of Steps (SOS) for these HRAs. Level 3 meetings take place in the field just prior to the scope of work beginning.

7.4.30 ***Site Supervision***

Contractor shall have supervision on site anytime that a Contractor is on site. This includes supervision of work that is taking place by subtier-contractor/supplier of Contractor.

END OF SECTION

SECTION 01 12 00.22A
BP 022A Mechanical (HVAC, Plumbing & BAS)

Section 1. Contractor's Work

The Contractor's Work includes all labor; supervision; materials; equipment; services; supplies; tools; facilities; transportation; storage; receiving; licenses; inspections; certifications; overhead; profit; insurance; and other items required or reasonably inferable to properly and timely perform and complete all work and services to be performed by the Contractor pursuant to this Agreement. Unless specifically stated otherwise, incidental work required to accomplish the work of this Bid Package shall be included in the bid. This would include, but not be limited to temporary facilities, protection of the work, security of equipment, materials, and work in progress, etc. Contractor's Work shall be completed in compliance with the standards described in the Prime Contract and in the Drawings and Specifications, or, if no such standards are specified, in compliance with industry standards.

Contractor's work includes the following Specification Division(s) and/or Section(s):

Spec Section	**Description**
Division 00	Procurement and Contracting Requirements
Division 01	General Requirements
02 41 00	Demolition (as applicable to this scope)
03 30 00	Cast in Place Concrete (as applicable to this work scope)
05 50 00	Metal Fabrications (as applicable to this work scope)
07 84 00	Firestopping (as applicable to this work scope)
07 92 00	Joint Sealants (as applicable to this work scope)
08 91 00	Louvers
Division 22	Plumbing
Division 23	Heating, Ventilating, and Air-Conditioning (HVAC)

Section 2. Contract Inclusions

The Contractor's Work specifically includes, but is not limited to the following:

2.1. General

2.1.1. Pricing escalations for all materials, equipment, product shortages or product availability or any other cause are the responsibility of the Contractor. Contractor shall take all necessary measures to ensure materials are procured in a manner that supports the Construction Manager's scheduled start dates, uninterrupted progress and activity durations. Storage for early procurement of materials if required will be the Contractor's responsibility and will be considered a means and method of construction to ensure timely completion of the work. All onsite-stored material shall be housed in accordance with requirements set forth within the Contract Documents. All cost escalations are included in the Contract Sum.

2.1.2. Joint Sealant Responsibility

2.1.2.1. In General, each Contractor is responsible for all joint sealants required to complete their scope of work's system.
2.1.2.2. Floor and Wall Penetrations – By Contractor Installing Penetration
2.1.2.3. Sealed Concrete Control Joints or Concrete Expansion Joints – By Concrete Contractor (BP 003A)
2.1.2.4. Brick and Masonry Wall System, Including Top of Walls to Structure – By Masonry Contractor (BP 004A)
2.1.2.5. Casework/Countertops – By GC Package Contractor (BP 006A)
2.1.2.6. Tile Control Joints – By GC Package Contractor (BP 006A)
2.1.2.7. Fluid Applied Cove Base to Wall – By GC Package Contractor (BP 006A)
2.1.2.8. Corner & Wall Guards to Wall – By GC Package Contractor (BP 006A)
2.1.2.9. Door Frames in Block Walls & Exterior Walls – By GC Package Contractor (BP 006A)
2.1.2.10. Fire Extinguisher Cabinet to Wall - By GC Package Contractor (BP 006A)
2.1.2.11. Roofing – By Roofing Contractor (BP 007A)
2.1.2.12. Metal Panels – By Metal Panels Contractor (BP 007B)
2.1.2.13. Aluminum Entrances – By Glazing Contractor (BP 008A)
2.1.2.14. Curtainwall System and Windows – By Glazing Contractor (BP 008A)
2.1.2.15. Drywall Wall System, Including Bottom & Top of Walls – By Drywall Package Contractor (BP 009A)
2.1.2.16. Drywall to Drywall Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.2.17. Drywall to Masonry Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.2.18. Drywall to any other surface - By Drywall Package Contractor (BP 009A)
2.1.2.19. Interior Door & Window Frames – By Drywall Package Contractor (BP 009A)
2.1.2.20. Aesthetic Sealant Between Drywall and Aluminum Frames – By Drywall Package Contractor (BP 009A)
2.1.2.21. Elevator Door Frames – By Drywall Package Contractor (BP 009A)
2.1.2.22. Site Paving – By Site Paving Contractor (BP 031A)

2.1.3. Fire Stopping Responsibility

2.1.3.1. In General, each Contractor is responsible for all fire stopping to complete their scope of work's system. Hilti Products must be used.
2.1.3.2. Floor and Wall Penetrations – By Contractor Installing Penetration
2.1.3.3. Top of Masonry Wall – By Masonry Contractor (BP 004A)
2.1.3.4. Masonry to Masonry Wall Transition – By Masonry Contractor (BP 004A)
2.1.3.5. Top of Drywall Wall – By Drywall Package Contractor (BP 009A)
2.1.3.6. Drywall to Drywall Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.3.7. Drywall to Masonry Wall Transition – By Drywall Package Contractor (BP 009A)

2.1.3.8. Drywall to any other surface – By Drywall Package Contractor (BP 009A)
2.1.3.9. Edge of Slab – By Drywall Package Contractor (BP 009A)

2.2. Plumbing

2.2.1. Contractor shall furnish and install a complete plumbing system per Contract Documents and any/all local, state and federal regulations and codes. The installation shall include all accessories and incidentals for a complete installation.
2.2.2. Contractor shall connect building underground to site utilities by others. Includes thrust blocks.
2.2.3. Contractor shall furnish and install any/all gas piping not called out to be installed by the Utility Company per the contract documents. This includes a complete system including any testing required.
2.2.4. Contractor is responsible for adjusting existing floor drains as necessary to align with new finished floors. Clean drains and replace grates as required by Contract Documents.
2.2.5. Contractor is responsible for all excavation, dewatering, and compacted backfill for any/all underground work. Excess material/spoils must be hauled off site. Contractor includes any/all pipe bedding materials and/or drainage materials required for this scope of work.
2.2.6. Contractor shall return final grade to +/- 0.1’ upon completion of underground work.
2.2.7. Contractor understands if they are required to trench through slab on grade rock subbase after it is installed, they shall bear the cost of subbase rework. Should any contamination occur due to Contractor’s work, Contractor shall bear the cost for rework.
2.2.8. Contractor shall furnish any/all flushing, chlorination, chemicals, cleaning of plumbing systems and piping with associated certification and test paperwork as required by Contract Documents.
2.2.9. Contractor shall furnish and install any/all sleeves for building substructures such as footings, foundations and precast. All sleeves and/or blockouts shall be shown on a shop drawing for approval by Structural EOR.
2.2.10. Contractor shall coordinate directly with the local utility company for gas service and meter to expedite this process. Contractor shall install the meter bracket. Costs of the meter and service proposal is by the owner.
2.2.11. Contractor shall protect drains from construction debris and damage.
2.2.12. Contractor shall furnish and install any/all concrete housekeeping pads and inertia bases as needed.
2.2.13. Contractor shall provide layout drawings/information for plumbing scope that requires blocking and or backing. The blocking and backing shall be furnished and installed by Bid Package 02 - General Construction.
2.2.14. Contractor shall furnish any/all plumbing equipment start-up, testing, and calibrating.
2.2.15. Contractor shall test, balance, and adjust any/all plumbing systems necessary to deliver complete and working systems. This work shall be completed in compliance with industry standards and local building codes.
2.2.16. Contractor shall coordinate with the Roofing Contractor on roof drain and overflow drain setting heights.

2.2.17. Contractor shall furnish a shop drawing showing dimensioned locations for roof drain frames and any roof mounted equipment requiring a steel frame for coordination with Bid Package 005A – Structural Steel & Misc. Metals. Shop drawing shall be made available at time of steel shop drawing approval process.

2.2.18. Contractor shall, immediately prior to the placement of the floor slabs and concrete paving, inspect plumbing work and make misalignment corrections as necessary. Provide tradesman during concrete placement activities to monitor plumbing rough-ins for misalignments during concrete placement. Correct any misalignments immediately during concrete placement activity.

2.2.19. Contractor shall provide temporary roof drain piping to the outside of the building to a location it will drain away from the site until final roof drain piping can be connected to roof drains.

2.2.20. Contractor includes providing access to water at the jobsite. Contractor to include necessary materials (water meter, hydrant valve, etc) so water is readily available and within close proximity to the building for use by all Contractors. Contractor includes coordinating with the local utility company and authority having jurisdiction as needed.

2.2.21. Contractor shall coordinate with BP 003A for install of boot wash embedded frame, to ensure plumbing & grate installed by this Contractor is as required.

2.3. Mechanical

2.3.1. Contractor shall furnish and install complete mechanical system per Contract Documents and any/all local, state and federal regulations and codes.

2.3.2. Contractor is responsible for relocation of salvaged condensing units at the very beginning of the addition phase. Contractor shall move units in such a manner that there is only one unit down at a time.

2.3.3. Contractor shall be responsible for install and hookup of cooler room condensing units & curbs. This includes coordination with cooler room installer.

2.3.4. Contractor shall furnish and install all conduit, pathways, cabling, and any other incidentals as required for the complete installation of the controls system.

2.3.5. Contractor shall furnish and install the site chilled water piping and the underground sump tank shown on M001

2.3.6. Contractor shall protect and maintain all ductwork ends throughout construction process and then remove.

2.3.7. Contractor understands permanent HVAC systems will be utilized for building temperature control, once installation of these systems is complete. Contractor understands major dust producing activities will be complete by this timeframe, but not all. Warranties will be required from substantial completion, not equipment start-up date.

2.3.8. Contractor shall furnish, install, and maintain all required temporary filter media for any/all HVAC systems while the project is under construction. This includes but is not limited to existing exterior soffit louver intakes, existing interior return and supply ducts where exposed to construction dust, new construction return and supply ducts, etc. Contractor shall plan to furnish enough filter media to reach final testing & balancing of

all HVAC equipment and building substantial completion. Permanent filters shall be installed upon building substantial completion.

2.3.9. Contractor shall furnish and install all pre-manufactured roof curbs for equipment in this scope. Contractor shall coordinate height of curbs with roofing insulation thickness. If a curb that is taller than what is specified is required, Contractor shall bear the cost.

2.3.10. Contractor shall perform a final clean of all mechanical equipment specified in this scope of work. Vacuum cleaning of the insides of all mechanical equipment shall be an element of final clean.

2.4. General Bid Package Specific Scope

2.4.1. Contractor shall be responsible for install of any Owner furnished, Contractor Installed (OFCI) and Contractor Furnished, Contractor Installed (CFCI) equipment or components called out specifically to be installed by division 22 or division 23 per the contract documents. Reference L-series drawings and division 11 for example.

2.4.2. Contractor shall be responsible for hookup of any equipment installed by other Prime Contractors or through this bid package which requires plumbing, mechanical or controls to function.

2.4.3. Contractor shall provide selective mechanical/plumbing demo and modification of existing system as required by the Contract Documents. Contractor shall be responsible for removing the demo items from the building to the dumpster(s), which are provided by the Construction Manager. Where new rough in is going through an existing partition, this contractor is responsible for the demo to get the pipe through the partition and the appropriate sealant around that penetration.

2.4.4. Contractor understands that the demo noted on the architectural demo plans is by BP 006A General Construction, but where existing ceilings (gyp or ACT) need to be removed for this scope, and that demo is not shown on the Contract Documents, then it is the responsibility of This Contractor. This contractor shall be responsible for replacing any ACT panels that they remove for this scope.

2.4.5. Contractor shall patch/seal any hole through the floor that is left behind after demo of this scope is complete. Patching of holes through gyp walls that is left behind after demo will be complete by BP 009A Framing/Drywall Contractor.

2.4.6. Contractor is responsible for any/all existing slab removal required for this scope. Removal limits are as needed to accomplish scope of work shown in the contract documents. This includes ground penetrating radar scan prior to each slab cut and coordinating with the Electrical Contractor to verify power is dead to any conduits found. This Contractor is responsible for subgrade prep, granular fill, and pourback of slab removed by this scope per the contract documents.

2.4.7. Contractor shall provide an allowance of $10,000 for unforeseen routing changes, re-work, miscellaneous construction support beyond the requirements of this scope. Contractor to provide written notice prior to usage of allowance. All expenditures to be tracked on daily tickets and signed by CM. Unused allowance to be credited back to project.

2.4.8. Contractor shall furnish framed opening drawings for all partition wall openings and assist with layout of openings with Framing Contractor.

2.4.9. Contractor shall furnish and install any/all miscellaneous metals required for this scope of work including, but not limited to, supports, bracing, backing, unistrut, hangers, hanger wire, all thread and other accessories required for support or placement.

2.4.10. Contractor shall furnish and install all insulations, sealants, angles, sprays, and any/all other accessories to properly seal any installations penetrating metal stud, gypsum assembly, or precast walls. All penetrations must be sealed to meet acoustical, fire, and/or smoke project requirements. Contractor shall only use Hilti products for fire and smoke requirements.

2.4.11. Contractor shall furnish and install caulking, joint sealants, and backer material for any materials under this scope of work.

2.4.12. Contractor shall furnish and install any/all vibration isolation for equipment including but not limited to; curbs, rails, pads, fasteners, and any/all miscellaneous components required for a complete assembly.

2.4.13. Contractor shall coordinate electrical requirements of all equipment furnished under this scope with Electrical Contractor during the submittal process. Contractor shall notify Electrical Contractor, Construction Manager and Architect in writing upon discovery of discrepancies between equipment being furnished and design power provisions.

2.4.14. Contractor shall furnish and install roof and floor protection required for the movement of workmen and/or equipment for Work defined by this Bid Package. All protection shall be supplied by Contractor to protect Work of others. Any damages by this Contractor shall be repaired at no cost to the Owner. Roof protection shall specifically include plywood over rigid insulation.

2.4.15. Contractor is responsible for the protection of all equipment and installed Work until final acceptance.

2.4.16. Contractor is responsible for core-drilling of any/all plumbing penetrations. Contractor shall carefully coordinate holes with Structural Engineer and other trades.

2.4.17. Contractor shall furnish all permits and fees and coordinate any/all inspections. Contractor shall notify the Contractor of all inspections prior to conducting.

2.4.18. Contractor shall advise of any access panel requirements to gain access to plumbing or mechanical scope if not shown on contract documents.

2.4.19. Contractor shall furnish and install caution tape that hangs down through the ceiling grid at any/all locations that require access by this contractor. Contractor understands the majority of the ceiling tile will be dropped before testing and balancing starts. This caution tape will signify to the ceiling contractor where to leave tile out.

2.4.20. Contractor understands that MEP overhead rough and framing activities will overlap and Contractor will need to work around framing regardless of what the bid schedule shows.

2.4.21. Contractor is responsible for coordination with the Construction Manager and Owner in order to ensure ongoing operations are not interrupted. Contractor understands that this may require work after normal hours.

2.4.22. Contractor shall coordinate and participate with 3rd Party Commissioning Agent as required by contract documents. This specifically includes attending multiple meetings

as required by the commissioning agent. This also includes providing a lift and an operator of the lift for the commissioning agent's use as required to access equipment.

2.4.23. Contractor shall complete all mechanical/plumbing connections as required for owner furnished residential appliances.

2.4.24. Contractor shall follow Indoor Air Quality Procedures 01 35 46 including but not limited to HVAC protection, source control, pathway interruption, housekeeping, temporary ventilation, scheduling, moisture control, and smoking policy.

2.4.25. Contractor shall provide a carbon monoxide monitoring plan in accordance with Construction Manager's safety policy for any slab pours in enclosed areas. Contractor to provide fans as needed.

2.4.26. Contractor shall include Siemens allowance in this scope, value to be determined in Addendum #3.

Section 3. Contract Exclusions

The Contractor's Work specifically excludes the following:

3.1. General Construction Waste Dumpsters (By CM)

3.2. Gas Meter, Gas Piping called out to be by utility company

3.3. Furnish of cooler room condensers & roof curbs

3.4. Boot wash embedded frame furnish and install (by BP 003A – Concrete)

Section 4. Contract Time

The Contractor's Work shall be completed as follows:

4.1. Contractor agrees to meet or exceed durations and sequences as outlined in the Milestone Construction Schedule (included in this specification section), and as modified from time to time during the course of the project and as communicated through regularly scheduled progress meetings. Increased manpower or overtime required to meet these obligations shall be borne by this Contractor.

4.2. Acceptance of Revised Master Construction Schedules - After each LEAN Last Planner pull session, the Construction Manager will compile the pulled activities and notify Contractors of the updated Master Construction Schedule. Within 48 hours of issuance by the Construction Manager, Contractors must accept or dispute the revised Master Construction Schedule. If any Contractor disputes the new handoff dates, disputing contractors will have an opportunity to re-pull their activities. All contractors will be held to the last fully accepted Master Construction Schedule.

4.3. Contractor shall provide sufficient labor, material, and equipment to maintain or improve upon the construction schedule.

4.4. Contractor shall assume working a standard forty-hour work week based on five (5) eight (8) hour days (Monday thru Friday).

4.5. Contractor shall provide the Construction Manager written notice 48 hours in advance of request to work additional hours during the week or on the weekend and is subject to Construction Manager's approval.

4.6. The Contractor understands that there will be concurrent work activities taking place that may require additional supervision, manpower, and equipment or material deliveries to accommodate the schedule needs.

4.7. Contractor agrees to mobilize on the scheduled start date and continue without pause, hesitation or interruption provided there is not impedance by others to his work.

4.8. Contractor understands that this project will require multiple mobilizations in order to complete their scope(s) of work due to project phasing, sequencing, as well as existing building operations needing to remain unaffected. Refer to G-series phasing & site logistics drawings for further information regarding project phasing.

Section 5. VDC/BIM Coordination

5.1. The Construction Manager shall lead the 3D Computer Model Coordination process. The Construction Manager will require coordination drawings and a 3D Model for the following trades: Steel (Bid Package 005A), Fire Protection (Bid Package 021A), Mechanical Ductwork, Piping and Equipment (Bid Package 0022A), and Electrical Piping & Equipment (Bid Package 026A). See 3D Coordination Drawing Matrix for further detail.

5.2. The coordination drawings shall be produced in three dimensional CAD, Revit, Archicad, or other 3D modeling software that allows for exporting, save as, or native import into Autodesk Navisworks for 3D model management. Coordination Drawings shall also be exported as 2D installation drawings and submitted to the Construction Manager.

5.3. The Construction Manager shall provide a Coordinated Computer Model in a Navisworks NWD file on a periodic basis and will be used for Contractors to reference and make corrections to each respective trade model until all conflicts are resolved.

5.4. Model Coordination Meetings shall be held at regular intervals to execute the process. The Construction Manager will lead model management efforts and will require the Contractors with model assignments to attend several meetings to assign special parameters of each trade prior to final approval of coordination drawings. The initial model coordination meeting will be to develop the file naming, origin coordination, and software file testing prior to 3D model and drawing conception. The coordination schedule and clash resolution priorities will also be reviewed and established. Contractors should allow for a model coordination meeting once a week until the process is complete. The coordination meetings shall be attended by each Contractor that is required to build a 3D Model. Each representative must have decision making authority and first-hand knowledge of what has been modeled and be prepared to resolve conflicts based on what is discussed in the coordination meeting.

5.5. Contractor understands that the expectation is VDC Modeling of new construction and construction in existing building at new ceiling & grid/framing work locations and MEP work showing tie-ins to existing systems. VDC Modeling also required for new systems below existing slab or in existing walls. Contractor shall field verify for their scope of work as early as possible without causing destructive demolition to the existing building.

3D Coordination Drawing Matrix

Description	Responsible Party	Level of Development (Defined by AIA E202)	Additional Requirements:
Architectural			
Foundations & Structural Concrete	Design Professional	300	
SOG	Design Professional	300	
Interior Walls	Design Professional	200	
Ceilings	Bid Package 022A	200	*Allows for better ceiling coordinattion
Metals			
Structural Steel	Bid Package 005A	400	
Misc Steel	Bid Package 005A	400	
Steel Joist	Bid Package 005A	400	
Steel Deck	Bid Package 005A	300	
Precast			
Walls	Not Applicable	400	*Includes all embeds and connection
Fire Sprinkler			
Piping Assemblies	Bid Package 021A	400	*Pumps, Tampers, Flows, Valves, etc.
Main Piping	Bid Package 021A	400	*Include hangers. All size piping.
Branch Piping	Bid Package 021A	400	*Include hangers. All size piping.
Drop Piping and Heads	Bid Package 021A	400	*All size piping.

Plumbing			
Underslab Piping	Bid Package 022A	400	*Includes from 5-0 outside of building.
Above Ground Piping	Bid Package 022A	400	*1/2" diameter and larger piping only.
Equipment	Bid Package 022A	400	All equipment
Mechanical			
Ductwork	Bid Package 022A	400	*All sizes.
Mechanical Piping	Bid Package 022A	400	*1/2" diameter and larger piping only. Includes hangers.
Equipment	Bid Package 022A	400	All equipment. Include clearance zones.
Electrical			
Underslab Conduits	Bid Package 026A	300	*1" diameter conduit, raceway, and larger. Show intended trenches.
Conduit, Raceways	Bid Package 026A	300	*1" diameter conduit, raceway, and larger. Includes cable tray.
Equipment and Panels	Bid Package 026A	300	*All panels, all sizes. Panel labels/names. Include code/service space requirements above and in front.
Light Fixtures	Bid Package 026A	300	Include install clearance.

Section 6. Jobsite

6.1. Nothing Hits The Floor

6.1.1. Contractor shall conform to Construction Manager's Nothing Hits the Floor Program. Placing material, tools, or debris on the floor or ground is prohibited.

6.1.2. Contractor shall provide rolling carts, debris containers or other means of collecting scrap material/trash at Contractor's work areas. Scrap material shall be promptly placed into containers when produced. Contractor shall remove its debris at least daily to dumpsters provided by others. When debris containers are shared amongst multiple Contractors, each Contractor shares an equal part in the responsibility of getting debris containers dumped into the dumpsters.

6.1.3. Contractor shall establish work/cutting stations at waist height in order to eliminate bending and or squatting down when cutting material. Cutting of material at ground level is prohibited.

6.1.4. Contractor agrees to use battery-operated tools wherever and whenever possible. If cordless tools cannot be utilized, all cords and hoses shall be elevated from the point they leave an outlet to the point of use. Contractor shall supply cord trees and S hooks as needed for equipment cords.

6.1.5. Contractor is responsible for all labor and equipment to unload, account for all material delivered, stock, and delivery for this scope of work. Materials to be installed will be delivered "just in time" to reduce the amount of material stored on the project site. Materials delivered and moved into the building shall be used within 3 work days unless otherwise authorized by Construction Manager. If anything stored obstructs the progress of any portion of the work, it shall be promptly removed or relocated by the Contractor without reimbursement. Attic stock shall be held at Contractor's storage until the end of project or approved by the Construction Manager.

6.1.6. At no time shall materials be stored directly on the floor or ground. All material at the Project shall be stored in trailers, wheeled carts, storage racks, storage bins, or on pallets. When wheeled carts are used, the casters shall be lockable. Materials shall only be stored on pallets or storage bins on level surfaces where they are accessible with a pallet jack.

6.2. Drug Free Verification Policy

Contractor agrees to be bound to, and comply with, the Construction Manager's Drug-Free Verification Policy. Contractors will provide only trades people who have given prior consent to submit to a drug test. The Construction Manager retains the right, but not the obligation, to require the Contractor's employees to be tested to insure that they are drug free. Contractor's

employees may be included in jobsite testing at the option of the Construction Manager. The Contractor will pay the cost of such drug testing.

6.3. Clean Up

6.3.1. The Contractor shall, on an on-going basis or at the direction of the Construction Manager, keep the Project site and surrounding area free from accumulation of waste materials, debris or rubbish caused by performance of the Contractor's Work.

6.3.2. If such clean-up is not properly or timely performed, Construction Manager shall give Contractor's representative a written notice to comply within 24 hours from the time notice is given. If Contractor fails to correct such noncompliance within said 24 hours, Construction Manager is authorized to perform the clean up and to assess Contractor a reasonable charge. Contractor also agrees to accept pro-rata responsibility for clean up of unclean conditions which Construction Manager is unable to identify to a particular Contractor. The Contract Sum will be reduced for Construction Manager's clean up costs.

6.3.3. Contractor shall cleanup and haul off to dumpster provided by others for all debris resulting from Contractor's scope of work. Contractor shall provide brooms, shovels and other equipment for Contractor's own clean-up.

6.3.4. In addition to the general clean up in paragraph above, Contractor shall furnish one laborer for each six (6) employees working on site the preceding four work days for clean up of general trash and debris. The Construction Manager shall supervise this clean up crew. If Contractor fails to comply with this clean up policy, Construction Manager shall reduce the Contract Sum in the amount of $100 per man hour for such non-participation in the weekly clean up effort.

6.3.5. Contractor shall take all necessary measures to prevent tracking of mud onto surrounding streets and driveways. Include street cleaning and/or sweeping necessitated by this scope and comply with all local codes.

6.4. Protection

6.4.1. Protect adjacent existing building elements from damage from Scope of work. Repair existing building elements damaged during Contractor's Scope of work.

6.5. Hoisting

Contractor is responsible for all hoisting facilities for Contractor's material, equipment and personnel to complete the work.

Section 7. Safety

7.1 **Safety Precautions**

The Contractor shall take all necessary safety precautions with respect to performance of the Contractor's Work and shall comply with applicable safety measures and with the applicable laws, ordinances, rules, regulations, and orders of public authorities and with the requirements of the Contract Documents for the safety of persons and property. The Contractor agrees to participate in periodic site safety meetings as requested by Construction Manager, including weekly "toolbox talks". The Contractor shall comply with all Project Safety Requirements listed in this section.

7.2 **Safety Protections**

The Contractor and its employees must, at a minimum, comply with all applicable laws, codes, rules, regulations and requirements pertaining to the safe performance of its Work, including the Federal Occupational Safety and Health Act (OSHA). Contractor agrees to provide protection as is necessary to protect all persons and property from Contractor's operations. Contractor shall effectively secure and protect the Contractor's Work. The Contractor shall furnish all safety equipment required to safely perform the Contractor's Work.

7.3 **Assumption of Safety Responsibility**

The Contractor agrees and acknowledges that it has assumed full responsibility and liability for safety precautions in connection with the construction means, methods, techniques, sequences, supervision and procedures pertaining to Contractor's Work.

7.4 **Safety Requirements**

The following minimum safety requirements are also applicable and will be enforced on this Project. Specific questions regarding these safety requirements should be directed to the Construction Manager.

7.4.1 ***Unsafe Conditions***

BE ALERT! All un-safe conditions shall be reported immediately to the Construction Manager's Project supervision and to the Contractor's Project Site Supervisor. No person is required to work under any unsafe conditions. OSHA Standard 1926.20.

7.4.2 ***Reporting Injuries***

All accidents or injuries deemed Recordable, Lost Time or Restricted by OSHA, or non-injury incidents resulting in property damage or high potential for severe injury shall be reported immediately to the Construction Manager's Superintendent, giving full details and identifications and statements of any witnesses. The Contractor shall be responsible for completing a written injury and/or incident investigation in accordance with referenced procedures and providing such report to the Construction Manager's supervision in a timely manner.

7.4.3 ***Project Safety Officer***

The Construction Manager's personnel have the authority to remove any of the Contractor's unsafe equipment, tools, scaffolding or other unsafe items, and have the authority to remove any Contractor employees that do not comply with these safety requirements. Contractors that receive two (2) written notices on the Project from the Construction Manager for failure to follow OSHA safety standards or these safety

requirements, may have their payment withheld until such time as the managing principal of the Contractor has met with the Construction Manager and agreed on a plan to eliminate future safety violations. Continuing violations of these safety requirements may also result in termination of the Contractor's continuing performance under this Agreement.

7.4.4 ***Fall Protection***

All work performed at elevations over 6 feet must have a 100 percent fall protection or prevention system. This includes, but is not limited to; all leading edge work, iron connecting, working off of elevated work platforms (scaffoldings), and residential type construction. Only methods referenced and meeting or exceeding OSHA Standard 1926 Subpart M shall be used.

"Monitors" or "safety zones" are NOT an acceptable means of fall protection unless other positive protection methods create a demonstrated greater hazard. The Contractor's use of "monitors" or "safety zones" requires the prior written consent of the Construction Manager and must, at a minimum, meet OSHA requirements. Safety monitors and other "non-positive" means of fall protection and prevention can only be used when a written Project Specific Fall Protection Plan is submitted to and approved in writing by the Construction Manager. The Contractor's written Fall Protection Plan must meet all OSHA requirements and provide the most effective employee protection possible. The Contractor is responsible for enforcement of its fall protection plan.

Where no identifiable tie off point is identifiable on the roof, Contractor shall provide roof cart or equivalent to complete Contractor's work.

7.4.5 ***Barricades***

Barricades or covers meeting OSHA Standards are required around excavations, holes or openings in floors or roofs, edges of roofs, elevated platforms, around certain types of overhead work and whenever necessary to warn or prevent persons or equipment from falling.

7.4.6 ***GFCI Protection***

All work using cords or power tools must utilize Ground Fault Circuit Interrupter (GFCI) protection. Only authorized electricians shall perform electrical work.

7.4.7 ***Excavations***

Excavations must be sloped, shored or shielded, and must meet all other OSHA requirements. Before digging in any location, the Contractor must check to ensure that all public & private underground utilities have been located and properly marked.

Contractor shall hydro-vac to confirm utility location if digging within 5 feet of marked utility. Hydro-vacing will then be required every 20' if digging alongside existing utilities, prior to digging with equipment.

When excavation is to occur within an existing building or similar location, Ground Penetrating Radar (or similar) shall be used to scan under slab on grade conditions for potential underground utilities.

Contractor shall complete a Ground Disturbance Permit for any operation that creates any man-made penetration, cut, cavity, trench, or depression formed by earth removal regardless of depth.

7.4.8 ***Lockout/Tag***

Contractor's employees shall comply with OSHA Standard 1910.147 lockout/tag procedures when working on energized systems or equipment. The Contractor may utilize Construction Manager's lockout/tag procedures. Contractor shall utilize the Daily Electrical Checklist anytime that lockout/tagout conditions change.

7.4.9 ***Personal Protective Equipment***

7.4.9.1 All of the Contractor's employees on the Project site must use proper personal protective equipment (PPE) and clothing suited to the Work and the Work environment. The Contractor is responsible for providing its personnel the proper PPE which includes; gloves where applicable; no dangling or loose clothing or jewelry may be worn around moving machinery; shirts which cover the shoulder, work boots or shoes, high visibility shirt/vest, and long pants are required; hardhats must be worn by all workers, supervisors, clients, visitors and vendors at all times; eye and face protection (meeting ANSI Z87.1-1989 standards) must be worn at all times on the Project site. Additional forms of eye protection may also be required as prescribed by OSHA standards and manufacturer recommendations. Steps must be taken to protect other workers and the public from eye injury whenever tasks producing flying chips or particles are being performed; respirators will be used when an employee is exposed to airborne hazards (proper training, physical exam and a fit test are required; 1910.134); hearing protection in the form of earmuffs or approved ear plugs shall be worn on all high noise level jobs as required; no radios will be allowed on the Project site other than 2-way radios for jobsite communication; and Contractor shall maintain appropriate first aid equipment and supplies in its Work areas at all times.

7.4.9.2 Contractor will provide ANSI cut 4 or higher gloves to their employees and ensure all subtiers are provided with the same. Gloves are required to be worn at all times.

7.4.9.3 Contractor employees and visitors who will be on site will be required to wear an ANSI Type II or an EN12492 helmet (i.e., a safety helmet that meets the requirements of testing against vertical, front, back, and side impacts and penetration) with an integrated four-point chin strap tightly attached and secured under the chin with no more than a 2-finger gap between strap and chin

7.4.10 ***Housekeeping***

Contractor shall maintain good housekeeping in and around its Work areas at all times. Stack materials so that safe clearances are maintained and falling is prevented. Keep all walk ways and aisles clear. Place cords and air hoses to one side (elevated) to allow safe passage. Remove loose overhead material, dispose of garbage. Immediately remove oil

and water spillage. Immediately remove or bend over nails protruding from lumber. Secure all stored or loose materials (especially on roof) to prevent it from becoming airborne.

7.4.11 ***Illumination***

All of Contractor's Work areas shall be properly illuminated at all times.

7.4.12 ***Ventilation***

All of Contractor's employees performing confined space work shall be properly trained. All necessary requirements contained in OSHA Standard1910.146 must be met. Contractor shall maintain proper ventilation in enclosed areas when using equipment.

7.4.13 ***Ladders***

Contractor shall train its employees in the safe use of ladders and scaffolding as required. Defective ladders and scaffold components shall be tagged and removed from service

7.4.14 ***Tools and Equipment***

Tools, equipment, trucks, loaders, backhoes, cranes and forklifts shall be used, operated and maintained properly to prevent injury. No Contractor employee shall operate any equipment unless specifically authorized and trained to do so. Powder-actuated tools require certified training before use. Power tools shall be operated only by authorized personnel and with guard's in-place. Hand tools such as hammers and chisels shall be properly used and maintained. All slings, choker and rigging equipment shall be free of defects. All hooks must have safety latches or keepers. Taglines shall be used to control loads when their use does not create an additional hazard. Tampering with or unauthorized use or removal of fire extinguishers from assigned locations is prohibited. All of Contractor's tools and equipment must be inspected daily by Contractor before use. Damaged tools shall be tagged "DO NOT USE" and removed from service immediately. Documentation of training and inspections shall be provided to the Construction Manager upon request.

7.4.15 ***Safety Plan***

A written Project specific safety plan and/or a Job Safety Analysis shall be completed. Such plans shall be completed and provided to the Construction Manager at least (2) weeks before the work begins.

7.4.16 ***Toolbox Talk***

Attendance at weekly Tool Box Talks is required for all Contractor personnel and documentation of meetings is mandatory. The Contractor shall ensure that its personnel watch Construction Manager's Safety Introduction as required by the Construction Manager prior to performing work on site.

7.4.17 ***Hazard Communication***

If Contractor or its Contractors bring any material to the Project site which requires notification to employees of the Contractor, Owner or its other contractors, suppliers, vendors, material men and/or local fire departments or other authorities, in conformance with applicable environmental, hazardous substance, right to know, or similar laws, the Construction Manager shall be provided with material safety data sheets to be available at the Project site for inspection and reference prior to delivery of such products or materials to the job-site. Contractor shall provide appropriate training for its job-site personnel. The Contractor shall maintain a hazardous material program, including proper placarding of all locations where hazardous materials are located, in conformance with the aforementioned laws.

7.4.18 ***Unsafe Acts***

Contractor's employees who report for work under the influence of intoxicants or narcotics or engage in the consumption of them on the Project site will be removed from the Project site. Contractor's employees who engage in horseplay, fistfights, unsafe acts, whistling, yelling at the public or obscene gestures will be removed from the Project site. Weapons of all types, including firearms, are strictly forbidden on the Project site.

7.4.19 ***Visitors***

All of Contractor's visitors to the Project site must check in with the Construction Manager's supervision prior to going on site.

7.4.20 ***Competent Person***

The Contractor shall identify their OSHA Competent Person for the work that they perform in either their written safety plan or in a memo form submitted at the beginning of work.

7.4.21 ***Project Site Communications***

Contractor shall have on site at all times a supervisor (or multiple supervisors if required by crew size) that is able to speak, understand and communicate in English all job site safety and contractual requirements, obligations and responsibilities to Contractor's workers and employees. Contractor shall require its' lower tier Contractors and suppliers to comply with this requirement and shall incorporate this section in its agreement with lower tier Contractors and suppliers.

7.4.22 ***Consent to Use of Drones***

Contractor and its employees consent to the use of an unmanned aerial system (UAS) at the Project site if approved by Construction Manager, and specifically to any UAS flyovers.

7.4.23 ***Hot Work Operations***

Hot work operations require the use of a permit.

Combustible Material: All portable combustible material must be removed a minimum of 20 feet away from the working area and adjoining areas.

Flammable Liquids or Vapors: Drums, tanks or other containers or explosive liquids or vapors must be cleaned and cleared of flammable or explosive liquids or vapors before work is done on them.

Pre-Operation Precautions: When feasible, work area should be wetted down.

Spark Control: Sheet metal guards, asbestos and similar protection must be provided to prevent hot metal and sparks from falling on combustible material which cannot be moved.

Fire Protection: If the area in which hot work operations are being performed is presently under operative sprinkler protection, the sprinklers in that area must be operative during welding or cutting operations. Suitable fire extinguishers or hand hose must be maintained near the operations. An extra person must be provided in the welding or cutting team whose sole responsibility is to watch for sparks and promptly use the extinguishing equipment.

Post-Operation Precautions: After work, a thorough check must be made for smoldering fire in out-of-the-way places, and guard patrol protection must be maintained for a minimum for one hour.

“Hot Work Operations” means:

The process whereby one or more of the parts to be joined is heated near of above its melting point, and the heated surfaces are caused to flow together.

The process of applying heat to bring to red heat the spot to be severed, gouged or pierced, and the metal is burned in a jet of oxygen;

Grinding operations that generate sparks;

Torch-on roofing operations;

Roof tarring operations.

7.4.24 ***Daily Stretch & Flex***

Contractor and its on-site crew (including sub-tier Contractors) will attend a daily stretch and flex to start each work day. All workers will meet at a central location on site for stretching and to review site logistics and/or other safety topics. Stretch and Flex will last for approximately 15 minutes. Construction Manager will facilitate the daily stretch and flex.

7.4.25 ***Daily JSA***

Contractor is responsible for pre-task planning, including filling out a daily Job Safety Analysis (JSA). The daily JSA is to be filled out each morning and reviewed with the Contractor’s crew prior to the crew starting work. Contractor shall fill out additional JSA’s during the day when conditions or tasks change. Contractor’s foreman shall

review the JSA each morning with the crew and obtain signatures. Contractor's foreman to keep JSA's clean and organized in Contractor's trailer or gang box. Construction Manager will review the daily JSA's with the foreman on a periodic basis.

7.4.26 ***Ladders Last Program***

Contractor shall comply with Construction Manager's Ladders Last program. This specifically includes all costs to furnish lifts/scaffolding, etc. as required to meet the program requirements.

Ladders are to be the last choice for accessing elevated work areas. Alternative means of access shall be used whenever feasible. Alternate means of access may include:

- Scissors life
- Aerial lift
- Scaffolding (Baker, Perry or other rolling scaffold)
- Rolling stairs
- Stair towers

Extension ladders may be set up in one location and used for access between elevations for a period of no more than one week. If long term access is required (more than one week), a stair tower, stairway or personnel hoist shall be utilized.

At no time will work be performed from an extension ladder without a permit. The cost of alternate means of accessing the work area is not to be a factor when determining whether to issue a permit for working from an extension ladder. 100% fall protection is required if work is to be performed at height of 6' or more from an extension ladder.

Step ladders 8' or less are allowed to be used without a permit.

When step ladders are used, platform style step ladders are the preferred ladder.

The ladder use permit must be completed and approved by the project team for requests to use step ladders greater than 8' in height or extension ladders for a duration of greater than one week.

The ladder Permit will be affixed to all ladders while in use. The inspection safety checklist (on the back of the permit) will be completed prior to use. The ladder and safety inspection checklist will be completed by a competent person.

7.4.27 ***Prime Contractor Executive Engagement***

Each month a Prime Contractor Executive will be asked to attend the morning stretch and flex, address the jobsite workers with a safety message and conduct a jobsite walk. This responsibility will rotate through the Prime Contractors on the project. The Construction Manager will coordinate with the Prime Contractors to set up a rotation.

7.4.28 ***Behavior Based Safety***

Contractor agrees to participate in the project Behavior Based Safety program that includes training and observations

7.4.29 ***Safety Meetings – Level 1, 2 and 3***

Contractor shall participate in Level 1, 2 and 3 safety meetings. Level 1 meetings are the standard preconstruction meetings. Level 2 meetings are only required if/when during the Level 1 meeting a scope of work is identified to have a High Risk Activity (HRA) associated with it. Level 2 meetings will be held two weeks prior to the scope of work beginning. Contractor will be required to develop a Method of Procedure (MOP) and Sequence of Steps (SOS) for these HRAs. Level 3 meetings take place in the field just prior to the scope of work beginning.

7.4.30 ***Site Supervision***

Contractor shall have supervision on site anytime that a Contractor is on site. This includes supervision of work that is taking place by subtier-contractor/supplier of Contractor.

END OF SECTION

SECTION 01 12 00.026A
026A - Electrical (Fire Alarm, Structured Cabling, Security, Access Control & AV)

Section 1. Contractor's Work

The Contractor's Work includes all labor; supervision; materials; equipment; services; supplies; tools; facilities; transportation; storage; receiving; licenses; inspections; certifications; overhead; profit; insurance; and other items required or reasonably inferable to properly and timely perform and complete all work and services to be performed by the Contractor pursuant to this Agreement. Unless specifically stated otherwise, incidental work required to accomplish the work of this Bid Package shall be included in the bid. This would include, but not be limited to temporary facilities, protection of the work, security of equipment, materials, and work in progress, etc. Contractor's Work shall be completed in compliance with the standards described in the Prime Contract and in the Drawings and Specifications, or, if no such standards are specified, in compliance with industry standards.

Contractor's work includes the following Specification Division(s) and/or Section(s):

Spec Section	**Description**
Division 00	Procurement and Contracting Requirements
Division 01	General Requirements
03 30 00	Cast in Place Concrete (as applicable to this work scope)
05 50 00	Metal Fabrications (as applicable to this work scope)
07 84 00	Firestopping (as applicable to this work scope)
07 92 00	Joint Sealants (as applicable to this work scope)
13 46 13	Lightning Protection for Structures
Division 26	Electrical
Division 27	Communications
Division 28	Electronic Safety and Security

Section 2. Contract Inclusions

The Contractor's Work specifically includes, but is not limited to the following:

2.1. General

2.1.1. Pricing escalations for all materials, equipment, product shortages or product availability or any other cause are the responsibility of the Contractor. Contractor shall take all necessary measures to ensure materials are procured in a manner that supports the Construction Manager's scheduled start dates, uninterrupted progress and activity durations. Storage for early procurement of materials if required will be the Contractor's responsibility and will be considered a means and method of construction to ensure timely completion of the work. All onsite-stored material shall be housed in accordance with requirements set forth within the Contract Documents. All cost escalations are included in the Contract Sum.

2.1.2. Joint Sealant Responsibility

2.1.2.1. In General, each Contractor is responsible for all joint sealants required to complete their scope of work's system.
2.1.2.2. Floor and Wall Penetrations – By Contractor Installing Penetration
2.1.2.3. Sealed Concrete Control Joints or Concrete Expansion Joints – By Concrete Contractor (BP 003A)
2.1.2.4. Brick and Masonry Wall System, Including Top of Walls to Structure – By Masonry Contractor (BP 004A)
2.1.2.5. Casework/Countertops – By GC Package Contractor (BP 006A)
2.1.2.6. Tile Control Joints – By GC Package Contractor (BP 006A)
2.1.2.7. Fluid Applied Cove Base to Wall – By GC Package Contractor (BP 006A)
2.1.2.8. Corner & Wall Guards to Wall – By GC Package Contractor (BP 006A)
2.1.2.9. Door Frames in Block Walls & Exterior Walls – By GC Package Contractor (BP 006A)
2.1.2.10. Fire Extinguisher Cabinet to Wall - By GC Package Contractor (BP 006A)
2.1.2.11. Roofing – By Roofing Contractor (BP 007A)
2.1.2.12. Metal Panels – By Metal Panels Contractor (BP 007B)
2.1.2.13. Aluminum Entrances – By Glazing Contractor (BP 008A)
2.1.2.14. Curtainwall System and Windows – By Glazing Contractor (BP 008A)
2.1.2.15. Drywall Wall System, Including Bottom & Top of Walls – By Drywall Package Contractor (BP 009A)
2.1.2.16. Drywall to Drywall Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.2.17. Drywall to Masonry Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.2.18. Drywall to any other surface - By Drywall Package Contractor (BP 009A)
2.1.2.19. Interior Door & Window Frames – By Drywall Package Contractor (BP 009A)
2.1.2.20. Aesthetic Sealant Between Drywall and Aluminum Frames – By Drywall Package Contractor (BP 009A)
2.1.2.21. Elevator Door Frames – By Drywall Package Contractor (BP 009A)
2.1.2.22. Site Paving – By Site Paving Contractor (BP 031A)

2.1.3. Fire Stopping Responsibility

2.1.3.1. In General, each Contractor is responsible for all fire stopping to complete their scope of work's system. Hilti Products must be used.
2.1.3.2. Floor and Wall Penetrations – By Contractor Installing Penetration
2.1.3.3. Top of Masonry Wall – By Masonry Contractor (BP 004A)
2.1.3.4. Masonry to Masonry Wall Transition – By Masonry Contractor (BP 004A)
2.1.3.5. Top of Drywall Wall – By Drywall Package Contractor (BP 009A)
2.1.3.6. Drywall to Drywall Wall Transition – By Drywall Package Contractor (BP 009A)
2.1.3.7. Drywall to Masonry Wall Transition – By Drywall Package Contractor (BP 009A)

2.1.3.8. Drywall to any other surface – By Drywall Package Contractor (BP 009A)
2.1.3.9. Edge of Slab – By Drywall Package Contractor (BP 009A)

2.2. Electrical

2.2.1. Contractor shall furnish and install the complete electrical scope as specified in the Contract documents. The installation shall include all accessories and incidentals for a complete installation.
2.2.2. Contractor shall furnish and install the lightning protection system as required by the Contract Documents.
2.2.3. Contractor shall provide selective electrical demo and modification of existing system as required by the Contract Documents. Contractor shall be responsible for removing the demo items from the building to the dumpster(s), which are provided by the Construction Manager. Where new rough in is going through an existing partition, this contractor is responsible for the demo to get the pipe through the partition and the appropriate sealant around that penetration.
2.2.4. Contractor shall be responsible for install of any Owner furnished, Contractor Installed (OFCI) and Contractor Furnished, Contractor Installed (CFCI) equipment or components called out specifically to be installed by division 26 per the contract documents. Reference L-series drawings and division 11 for example.
2.2.5. Contractor understands that relocation of existing condensing units to the roof (by BP 022A) is to be done at the very beginning of the project. This Contractor shall coordinate with installing contractor for timing and location for power hookup. Contractor understands that this work will be sequenced such that only one unit is down at a time.
2.2.6. Contractor shall be responsible for hookup of any equipment installed by other Prime Contractors or through this bid package which requires electrical or low voltage to function.
2.2.7. Contractor understands that the demo noted on the architectural demo plans is by BP 006A General Construction, but where existing ceilings (gyp or ACT) need to be removed for this scope, and that demo is not shown on the Contract Documents, then it is the responsibility of This Contractor. This contractor shall be responsible for replacing any ACT panels that they remove for this scope.
2.2.8. Contractor shall patch/seal any hole through the floor that is left behind after demo of this scope is complete. Patching of holes through gyp walls that is left behind after demo will be complete by BP 009A Framing/Drywall Contractor.
2.2.9. Contractor is responsible for any/all existing slab removal required for this scope. Removal limits are as needed to accomplish scope of work shown in the contract documents. This includes ground penetrating radar scan prior to each slab cut and coordinating with the Mech./Plumbing Contractor to verify power is dead to any conduits found & any underground plumbing is accounted for. This Contractor is responsible for subgrade prep, granular fill, and pourback of slab removed by this scope per the contract documents.
2.2.10. Contractor shall provide an allowance of $10,000 for unforeseen routing changes, re-work, miscellaneous construction support beyond the requirements of this scope. Contractor to provide written notice prior to usage of allowance. All expenditures to be

tracked on daily tickets and signed by CM. Unused allowance to be credited back to project.

2.2.11. Contractor shall provide conduit rough-in to conceal low voltage wiring for sensors at overhead coiling doors and automatic sliding doors. This Contractor shall coordinate with others to ensure any power and low voltage conduits are routed to location as required per the contract documents.

2.2.12. Contractor shall install any/all electric boot/shoe dryers. The boot/shoe dryer will be provided by BP 006A – General Construction.

2.2.13. Contractor shall coordinate with BP 006A – General Construction to ensure all it is safe to begin demo before demo begins.

2.2.14. Contractor shall provide any/all survey/layout/staking for this scope of work. Contractor shall utilize Snyder for all site survey/layout/staking.

2.2.15. Contractor shall furnish all permits and fees and coordinate any/all inspections. Contractor shall notify the Contractor of all inspections prior to conducting.

2.2.16. Contractor shall coordinate with BP 003A – Concrete on the generator pad installation. BP 003A will pour the pad, but This contractor shall help to coordinate the final size with the final selected equipment.

2.2.17. Contractor shall furnish and install site lighting bases.

2.2.18. Contractor is responsible for backfill of all conduit trenches and compaction to specified densities. Contractor shall coordinate with 3rd party Testing Agency to confirm backfill densities have been reached.

2.2.19. Contractor is responsible for all excavation, dewatering, and compacted backfill for any/all underground electrical work. Excess material/spoils must be hauled offsite. Contractor includes any/all pipe bedding materials and/or drainage materials required for this scope of work.

2.2.20. Contractor shall return final grade to +/- 0.1 foot upon completion of underground work.

2.2.21. Contractor understands if they are required to trench through slab on grade rock subbase after it is installed, they shall bear the cost of subbase rework. Should any contamination occur due to Contractor's work, Contractor shall bear the cost for rework.

2.2.22. Contractor shall provide own means for concrete washout for this scope.

2.2.23. Contractor understands that furnish and install of any housekeeping / equipment pads will be by BP 003A – Concrete. Contractor shall coordinate with BP 003A for pourback location, size, timing, etc. This Contractor shall furnish and install any/all housekeeping pads as needed for this scope that are not shown on the contract documents.

2.2.24. Contractor shall furnish and install any/all sleeves for building substructures such as footings and foundations. All sleeves and/or blockouts shall be shown on a shop drawing for approval by Structural EOR.

2.2.25. Contractor shall furnish and install disconnects at mechanical equipment without internal disconnects. Coordination directly with Bid Package 022A - Mechanical.

2.2.26. Contractor shall furnish and install all electric provisions for door hardware as required by the door hardware schedule and specifications. Bid Package 006A – General

Construction and BP 008A - Glazing Systems will turn over electrical components to This Contractor for installation.

2.2.27. Contractor shall complete all electrical work, fire alarm interface and electrical terminations for fire suppression system necessary to deliver complete and working system.

2.2.28. Contractor shall furnish and install layout drawings/information for electrical scope that requires blocking and or backing. Blocking and backing shall be furnished and install by Bid Package 006A - General Construction.

2.2.29. Contractor shall furnish and install any/all miscellaneous metals required for this scope of work including, but not limited to, supports, bracing, backing, unistrut, hangers, hanger wire, all thread and other accessories required for support or placement.

2.2.30. Contractor shall furnish and install all insulations, sealants, angles, sprays, and any/all other accessories to properly seal any installations penetrating metal stud, gypsum assembly and/or CMU walls. All penetrations must be sealed to meet acoustical, fire and smoke requirements. Contractor shall furnish Hilti materials for fire and smoke requirements.

2.2.31. Contractor shall furnish and install caulking, joint sealants, and backer material for any materials under this scope of work.

2.2.32. Contractor shall furnish and install roof and floor protection required for the movement of workmen and/or equipment for Work defined by this Bid Package. All protection shall be supplied by Contractor to protect Work of others. Any damages by this Contractor shall be repaired at no cost to the Owner.

2.2.33. Contractor is responsible for the protection of all equipment and installed Work until final acceptance.

2.2.34. Contractor shall, immediately prior to the placement of the floor slabs, elevated slabs, and concrete paving, inspect electrical work and make misalignment corrections as necessary. Provide tradesman during concrete placement activities to monitor electrical rough-ins for misalignments during concrete placement. Correct any misalignments immediately during concrete placement activity.

2.2.35. Contractor is responsible for core-drilling of any/all electrical penetrations. Contractor shall carefully coordinate holes with Structural Engineer and other trades.

2.2.36. Contractor shall advise of any access panel requirements to gain access to electrical scope. Contractor shall furnish all access panels that are required by this scope, but not shown on the plans for installation by others.

2.2.37. Contractor shall provide a final clean of all electrical equipment within this scope of work.

2.2.38. Contractor agrees to complete Construction Manager's Pre-Energization Plan and Daily Electrical Checklist as requested.

2.2.39. Contractor shall coordinate and participate with 3rd Party Commissioning Agent as required by contract documents. This specifically includes attending multiple meetings as required by the commissioning agent. This also includes providing a lift and an operator of the lift for the commissioning agent's use as required to access equipment.

2.2.40. Contractor shall complete all electrical connections as required for equipment noted as Owner or Contractor provided on the equipment schedule.

2.2.41. Contractor is responsible for coordination with the Construction Manager and Owner in order to ensure ongoing operations are not interrupted. Contractor understands that this may require work after normal hours for any shutdowns due to tie-ins, testing, etc or other circumstances which would affect normal building operations.

2.2.42. Contractor shall accommodate the project & schedule to allow for equipment startup, testing, commissioning etc, occur on time with a temporary solution in the case that electrical equipment is not able to be procured by that point.

2.2.43. Contractor shall provide a carbon monoxide monitoring plan in accordance with Construction Manager's safety policy for any slab pours in enclosed areas. Contractor to provide fans as needed.

2.3. Temporary Power/Lighting

2.3.1. Coordinate with local utility company if necessary to provide power services for the project and Construction Manager's job trailer.

2.3.2. OSHA power and lighting for construction use. Every room should meet OSHA lighting requirements. Contractor shall provide a minimum of one hanging light in each room. Wobble/Flood lights are not to be used.

2.3.3. Adequate distribution of construction power capable of plugging in a 100' extension cord.

2.3.4. Provide temp safety lighting at exterior of Construction Manager's job trailer area.

2.3.5. Provide temp power to temporary construction heaters.

2.3.6. Removal of temp systems at time designated by Construction Manager.

2.4. Communications

2.4.1. Contractor shall furnish and install the complete communications scope as specified in the contract documents. The installation shall include all accessories and incidentals for a complete installation.

2.4.2. Contractor shall provide selective technology demo and modification of existing system as required by the Contract Documents. Contractor shall be responsible for removing the demo items from the building to the dumpster(s), which are provided by the Construction Manager. Where new rough in is going through an existing partition, this contractor is responsible for the demo to get the pipe through the partition and the appropriate sealant around that penetration.

2.4.3. Contractor understands that the demo noted on the architectural demo plans is by BP 006A General Construction, but where existing ceilings (gyp or ACT) need to be removed for this scope, and that demo is not shown on the Contract Documents, then it is the responsibility of This Contractor. This contractor shall be responsible for replacing any ACT panels that they remove for this scope.

2.4.4. Contractor shall patch/seal any hole through the floor that is left behind after demo of this scope is complete. Patching of holes through gyp walls that is left behind

2.4.5. Contractor shall coordinate with installer of coiling doors, automatic roller shades, manual slide gate, and other equipment requiring power and/or communications/safety & security to ensure provided pathways, routing, and cabling are as required.

2.4.6. Contractor shall include Basepoint allowance in this scope, value to be determined in Addendum #3.

2.5. Electronic Safety and Security

2.5.1. Contractor shall furnish and install the complete electronic security and safety scope as specified in the contract documents. The installation shall include all accessories and incidentals for a complete installation.

2.5.2. Contractor shall be responsible for ensuring that existing access control and cameras are operational throughout the project.

2.5.3. Contractor shall be responsible for the dual height pedestal at garage door as required by this scope including but not limited to the foundation, anchoring, entry pad, pathways and cabling/wiring. Furnish of pedestal is by Basepoint.

Section 3. Contract Exclusions

The Contractor's Work specifically excludes the following:

3.1. General Construction Waste Dumpsters (By CM)
3.2. Plywood at telecom/elec room walls (By BP 006A – General Construction)
3.3. Generator Pad/Footings (By BP 003A – Concrete)

Section 4. Contract Time

The Contractor's Work shall be completed as follows:

4.1. Contractor agrees to meet or exceed durations and sequences as outlined in the Milestone Construction Schedule (included in this specification section), and as modified from time to time during the course of the project and as communicated through regularly scheduled progress meetings. Increased manpower or overtime required to meet these obligations shall be borne by this Contractor.

4.2. Acceptance of Revised Master Construction Schedules - After each LEAN Last Planner pull session, the Construction Manager will compile the pulled activities and notify Contractors of the updated Master Construction Schedule. Within 48 hours of issuance by the Construction Manager, Contractors must accept or dispute the revised Master Construction Schedule. If any Contractor disputes the new handoff dates, disputing contractors will have an opportunity to re-pull their activities. All contractors will be held to the last fully accepted Master Construction Schedule.

4.3. Contractor shall provide sufficient labor, material, and equipment to maintain or improve upon the construction schedule.

4.4. Contractor shall assume working a standard forty-hour work week based on five (5) eight (8) hour days (Monday thru Friday).

4.5. Contractor shall provide the Construction Manager written notice 48 hours in advance of request to work additional hours during the week or on the weekend and is subject to Construction Manager's approval.

4.6. The Contractor understands that there will be concurrent work activities taking place that may require additional supervision, manpower, and equipment or material deliveries to accommodate the schedule needs.

4.7. Contractor agrees to mobilize on the scheduled start date and continue without pause, hesitation or interruption provided there is not impedance by others to his work.

4.8. Contractor understands that this project will require multiple mobilizations in order to complete their scope(s) of work due to project phasing, sequencing, as well as existing building operations needing to remain unaffected. Refer to G-series phasing & site logistics drawings for further information regarding project phasing.

Section 5. VDC/BIM Coordination

5.1. The Construction Manager shall lead the 3D Computer Model Coordination process. The Construction Manager will require coordination drawings and a 3D Model for the following trades: Steel (Bid Package 005A), Fire Protection (Bid Package 021A), Mechanical Ductwork, Piping and Equipment (Bid Package 0022A), and Electrical Piping & Equipment (Bid Package 026A). See 3D Coordination Drawing Matrix for further detail.

5.2. The coordination drawings shall be produced in three dimensional CAD, Revit, Archicad, or other 3D modeling software that allows for exporting, save as, or native import into Autodesk Navisworks for 3D model management. Coordination Drawings shall also be exported as 2D installation drawings and submitted to the Construction Manager.

5.3. The Construction Manager shall provide a Coordinated Computer Model in a Navisworks NWD file on a periodic basis and will be used for Contractors to reference and make corrections to each respective trade model until all conflicts are resolved.

5.4. Model Coordination Meetings shall be held at regular intervals to execute the process. The Construction Manager will lead model management efforts and will require the Contractors with model assignments to attend several meetings to assign special parameters of each trade prior to final approval of coordination drawings. The initial model coordination meeting will be to develop the file naming, origin coordination, and software file testing prior to 3D model and drawing conception. The coordination schedule and clash resolution priorities will also be reviewed and established. Contractors should allow for a model coordination meeting once a week until the process is complete. The coordination meetings shall be attended by each Contractor that is required to build a 3D Model. Each representative must have decision making authority and first-hand knowledge of what has been modeled and be prepared to resolve conflicts based on what is discussed in the coordination meeting.

5.5. Contractor understands that the expectation is VDC Modeling of new construction and construction in existing building at new ceiling & grid/framing work locations and MEP work showing tie-ins to existing systems. VDC Modeling also required for new systems below existing slab or in existing walls. Contractor shall field verify for their scope of work as early as possible without causing destructive demolition to the existing building.

3D Coordination Drawing Matrix

Description	Responsible Party	Level of Development (Defined by AIA E202)	Additional Requirements:
Architectural			
Foundations & Structural Concrete	Design Professional	300	
SOG	Design Professional	300	
Interior Walls	Design Professional	200	
Ceilings	Bid Package 022A	200	*Allows for better ceiling coordinattion
Metals			
Structural Steel	Bid Package 005A	400	
Misc Steel	Bid Package 005A	400	
Steel Joist	Bid Package 005A	400	
Steel Deck	Bid Package 005A	300	
Precast			
Walls	Not Applicable	400	*Includes all embeds and connection
Fire Sprinkler			
Piping Assemblies	Bid Package 021A	400	*Pumps, Tampers, Flows, Valves, etc.
Main Piping	Bid Package 021A	400	*Include hangers. All size piping.
Branch Piping	Bid Package 021A	400	*Include hangers. All size piping.
Drop Piping and Heads	Bid Package 021A	400	*All size piping.

Plumbing			
Underslab Piping	Bid Package 022A	400	*Includes from 5-0 outside of building.
Above Ground Piping	Bid Package 022A	400	*1/2" diameter and larger piping only.
Equipment	Bid Package 022A	400	All equipment
Mechanical			
Ductwork	Bid Package 022A	400	*All sizes.
Mechanical Piping	Bid Package 022A	400	*1/2" diameter and larger piping only. Includes hangers.
Equipment	Bid Package 022A	400	All equipment. Include clearance zones.
Electrical			
Underslab Conduits	Bid Package 026A	300	*1" diameter conduit, raceway, and larger. Show intended trenches.
Conduit, Raceways	Bid Package 026A	300	*1" diameter conduit, raceway, and larger. Includes cable tray.
Equipment and Panels	Bid Package 026A	300	*All panels, all sizes. Panel labels/names. Include code/service space requirements above and in front.
Light Fixtures	Bid Package 026A	300	Include install clearance.

Section 6. Jobsite

6.1. Nothing Hits The Floor

6.1.1. Contractor shall conform to Construction Manager's Nothing Hits the Floor Program. Placing material, tools, or debris on the floor or ground is prohibited.

6.1.2. Contractor shall provide rolling carts, debris containers or other means of collecting scrap material/trash at Contractor's work areas. Scrap material shall be promptly placed into containers when produced. Contractor shall remove its debris at least daily to dumpsters provided by others. When debris containers are shared amongst multiple Contractors, each Contractor shares an equal part in the responsibility of getting debris containers dumped into the dumpsters.

6.1.3. Contractor shall establish work/cutting stations at waist height in order to eliminate bending and or squatting down when cutting material. Cutting of material at ground level is prohibited.

6.1.4. Contractor agrees to use battery-operated tools wherever and whenever possible. If cordless tools cannot be utilized, all cords and hoses shall be elevated from the point they leave an outlet to the point of use. Contractor shall supply cord trees and S hooks as needed for equipment cords.

6.1.5. Contractor is responsible for all labor and equipment to unload, account for all material delivered, stock, and delivery for this scope of work. Materials to be installed will be delivered "just in time" to reduce the amount of material stored on the project site. Materials delivered and moved into the building shall be used within 3 work days unless otherwise authorized by Construction Manager. If anything stored obstructs the progress of any portion of the work, it shall be promptly removed or relocated by the Contractor without reimbursement. Attic stock shall be held at Contractor's storage until the end of project or approved by the Construction Manager.

6.1.6. At no time shall materials be stored directly on the floor or ground. All material at the Project shall be stored in trailers, wheeled carts, storage racks, storage bins, or on pallets. When wheeled carts are used, the casters shall be lockable. Materials shall only be stored on pallets or storage bins on level surfaces where they are accessible with a pallet jack.

6.2. Drug Free Verification Policy

Contractor agrees to be bound to, and comply with, the Construction Manager's Drug-Free Verification Policy. Contractors will provide only trades people who have given prior consent to submit to a drug test. The Construction Manager retains the right, but not the obligation, to require the Contractor's employees to be tested to insure that they are drug free. Contractor's

employees may be included in jobsite testing at the option of the Construction Manager. The Contractor will pay the cost of such drug testing.

6.3. Clean Up

6.3.1. The Contractor shall, on an on-going basis or at the direction of the Construction Manager, keep the Project site and surrounding area free from accumulation of waste materials, debris or rubbish caused by performance of the Contractor's Work.

6.3.2. If such clean-up is not properly or timely performed, Construction Manager shall give Contractor's representative a written notice to comply within 24 hours from the time notice is given. If Contractor fails to correct such noncompliance within said 24 hours, Construction Manager is authorized to perform the clean up and to assess Contractor a reasonable charge. Contractor also agrees to accept pro-rata responsibility for clean up of unclean conditions which Construction Manager is unable to identify to a particular Contractor. The Contract Sum will be reduced for Construction Manager's clean up costs.

6.3.3. Contractor shall cleanup and haul off to dumpster provided by others for all debris resulting from Contractor's scope of work. Contractor shall provide brooms, shovels and other equipment for Contractor's own clean-up.

6.3.4. In addition to the general clean up in paragraph above, Contractor shall furnish one laborer for each six (6) employees working on site the preceding four work days for clean up of general trash and debris. The Construction Manager shall supervise this clean up crew. If Contractor fails to comply with this clean up policy, Construction Manager shall reduce the Contract Sum in the amount of $100 per man hour for such non-participation in the weekly clean up effort.

6.3.5. Contractor shall take all necessary measures to prevent tracking of mud onto surrounding streets and driveways. Include street cleaning and/or sweeping necessitated by this scope and comply with all local codes.

6.4. Protection

6.4.1. Protect adjacent existing building elements from damage from Scope of work. Repair existing building elements damaged during Contractor's Scope of work.

6.5. Hoisting

Contractor is responsible for all hoisting facilities for Contractor's material, equipment and personnel to complete the work.

Section 7. Safety

7.1 **Safety Precautions**

The Contractor shall take all necessary safety precautions with respect to performance of the Contractor's Work and shall comply with applicable safety measures and with the applicable laws, ordinances, rules, regulations, and orders of public authorities and with the requirements of the Contract Documents for the safety of persons and property. The Contractor agrees to participate in periodic site safety meetings as requested by Construction Manager, including weekly "toolbox talks". The Contractor shall comply with all Project Safety Requirements listed in this section.

7.2 **Safety Protections**

The Contractor and its employees must, at a minimum, comply with all applicable laws, codes, rules, regulations and requirements pertaining to the safe performance of its Work, including the Federal Occupational Safety and Health Act (OSHA). Contractor agrees to provide protection as is necessary to protect all persons and property from Contractor's operations. Contractor shall effectively secure and protect the Contractor's Work. The Contractor shall furnish all safety equipment required to safely perform the Contractor's Work.

7.3 **Assumption of Safety Responsibility**

The Contractor agrees and acknowledges that it has assumed full responsibility and liability for safety precautions in connection with the construction means, methods, techniques, sequences, supervision and procedures pertaining to Contractor's Work.

7.4 **Safety Requirements**

The following minimum safety requirements are also applicable and will be enforced on this Project. Specific questions regarding these safety requirements should be directed to the Construction Manager.

7.4.1 ***Unsafe Conditions***

BE ALERT! All un-safe conditions shall be reported immediately to the Construction Manager's Project supervision and to the Contractor's Project Site Supervisor. No person is required to work under any unsafe conditions. OSHA Standard 1926.20.

7.4.2 ***Reporting Injuries***

All accidents or injuries deemed Recordable, Lost Time or Restricted by OSHA, or non-injury incidents resulting in property damage or high potential for severe injury shall be reported immediately to the Construction Manager's Superintendent, giving full details and identifications and statements of any witnesses. The Contractor shall be responsible for completing a written injury and/or incident investigation in accordance with referenced procedures and providing such report to the Construction Manager's supervision in a timely manner.

7.4.3 ***Project Safety Officer***

The Construction Manager's personnel have the authority to remove any of the Contractor's unsafe equipment, tools, scaffolding or other unsafe items, and have the authority to remove any Contractor employees that do not comply with these safety requirements. Contractors that receive two (2) written notices on the Project from the Construction Manager for failure to follow OSHA safety standards or these safety

requirements, may have their payment withheld until such time as the managing principal of the Contractor has met with the Construction Manager and agreed on a plan to eliminate future safety violations. Continuing violations of these safety requirements may also result in termination of the Contractor's continuing performance under this Agreement.

7.4.4 ***Fall Protection***

All work performed at elevations over 6 feet must have a 100 percent fall protection or prevention system. This includes, but is not limited to; all leading edge work, iron connecting, working off of elevated work platforms (scaffoldings), and residential type construction. Only methods referenced and meeting or exceeding OSHA Standard 1926 Subpart M shall be used.

"Monitors" or "safety zones" are NOT an acceptable means of fall protection unless other positive protection methods create a demonstrated greater hazard. The Contractor's use of "monitors" or "safety zones" requires the prior written consent of the Construction Manager and must, at a minimum, meet OSHA requirements. Safety monitors and other "non-positive" means of fall protection and prevention can only be used when a written Project Specific Fall Protection Plan is submitted to and approved in writing by the Construction Manager. The Contractor's written Fall Protection Plan must meet all OSHA requirements and provide the most effective employee protection possible. The Contractor is responsible for enforcement of its fall protection plan.

Where no identifiable tie off point is identifiable on the roof, Contractor shall provide roof cart or equivalent to complete Contractor's work.

7.4.5 ***Barricades***

Barricades or covers meeting OSHA Standards are required around excavations, holes or openings in floors or roofs, edges of roofs, elevated platforms, around certain types of overhead work and whenever necessary to warn or prevent persons or equipment from falling.

7.4.6 ***GFCI Protection***

All work using cords or power tools must utilize Ground Fault Circuit Interrupter (GFCI) protection. Only authorized electricians shall perform electrical work.

7.4.7 ***Excavations***

Excavations must be sloped, shored or shielded, and must meet all other OSHA requirements. Before digging in any location, the Contractor must check to ensure that all public & private underground utilities have been located and properly marked.

Contractor shall hydro-vac to confirm utility location if digging within 5 feet of marked utility. Hydro-vacing will then be required every 20' if digging alongside existing utilities, prior to digging with equipment.

When excavation is to occur within an existing building or similar location, Ground Penetrating Radar (or similar) shall be used to scan under slab on grade conditions for potential underground utilities.

Contractor shall complete a Ground Disturbance Permit for any operation that creates any man-made penetration, cut, cavity, trench, or depression formed by earth removal regardless of depth.

7.4.8 ***Lockout/Tag***

Contractor's employees shall comply with OSHA Standard 1910.147 lockout/tag procedures when working on energized systems or equipment. The Contractor may utilize Construction Manager's lockout/tag procedures. Contractor shall utilize the Daily Electrical Checklist anytime that lockout/tagout conditions change.

7.4.9 ***Personal Protective Equipment***

7.4.9.1 All of the Contractor's employees on the Project site must use proper personal protective equipment (PPE) and clothing suited to the Work and the Work environment. The Contractor is responsible for providing its personnel the proper PPE which includes; gloves where applicable; no dangling or loose clothing or jewelry may be worn around moving machinery; shirts which cover the shoulder, work boots or shoes, high visibility shirt/vest, and long pants are required; hardhats must be worn by all workers, supervisors, clients, visitors and vendors at all times; eye and face protection (meeting ANSI Z87.1-1989 standards) must be worn at all times on the Project site. Additional forms of eye protection may also be required as prescribed by OSHA standards and manufacturer recommendations. Steps must be taken to protect other workers and the public from eye injury whenever tasks producing flying chips or particles are being performed; respirators will be used when an employee is exposed to airborne hazards (proper training, physical exam and a fit test are required; 1910.134); hearing protection in the form of earmuffs or approved ear plugs shall be worn on all high noise level jobs as required; no radios will be allowed on the Project site other than 2-way radios for jobsite communication; and Contractor shall maintain appropriate first aid equipment and supplies in its Work areas at all times.

7.4.9.2 Contractor will provide ANSI cut 4 or higher gloves to their employees and ensure all subtiers are provided with the same. Gloves are required to be worn at all times.

7.4.9.3 Contractor employees and visitors who will be on site will be required to wear an ANSI Type II or an EN12492 helmet (i.e., a safety helmet that meets the requirements of testing against vertical, front, back, and side impacts and penetration) with an integrated four-point chin strap tightly attached and secured under the chin with no more than a 2-finger gap between strap and chin

7.4.10 ***Housekeeping***

Contractor shall maintain good housekeeping in and around its Work areas at all times. Stack materials so that safe clearances are maintained and falling is prevented. Keep all walk ways and aisles clear. Place cords and air hoses to one side (elevated) to allow safe passage. Remove loose overhead material, dispose of garbage. Immediately remove oil

and water spillage. Immediately remove or bend over nails protruding from lumber. Secure all stored or loose materials (especially on roof) to prevent it from becoming airborne.

7.4.11 ***Illumination***

All of Contractor's Work areas shall be properly illuminated at all times.

7.4.12 ***Ventilation***

All of Contractor's employees performing confined space work shall be properly trained. All necessary requirements contained in OSHA Standard1910.146 must be met. Contractor shall maintain proper ventilation in enclosed areas when using equipment.

7.4.13 ***Ladders***

Contractor shall train its employees in the safe use of ladders and scaffolding as required. Defective ladders and scaffold components shall be tagged and removed from service

7.4.14 ***Tools and Equipment***

Tools, equipment, trucks, loaders, backhoes, cranes and forklifts shall be used, operated and maintained properly to prevent injury. No Contractor employee shall operate any equipment unless specifically authorized and trained to do so. Powder-actuated tools require certified training before use. Power tools shall be operated only by authorized personnel and with guard's in-place. Hand tools such as hammers and chisels shall be properly used and maintained. All slings, choker and rigging equipment shall be free of defects. All hooks must have safety latches or keepers. Taglines shall be used to control loads when their use does not create an additional hazard. Tampering with or unauthorized use or removal of fire extinguishers from assigned locations is prohibited. All of Contractor's tools and equipment must be inspected daily by Contractor before use. Damaged tools shall be tagged "DO NOT USE" and removed from service immediately. Documentation of training and inspections shall be provided to the Construction Manager upon request.

7.4.15 ***Safety Plan***

A written Project specific safety plan and/or a Job Safety Analysis shall be completed. Such plans shall be completed and provided to the Construction Manager at least (2) weeks before the work begins.

7.4.16 ***Toolbox Talk***

Attendance at weekly Tool Box Talks is required for all Contractor personnel and documentation of meetings is mandatory. The Contractor shall ensure that its personnel watch Construction Manager's Safety Introduction as required by the Construction Manager prior to performing work on site.

7.4.17 ***Hazard Communication***

If Contractor or its Contractors bring any material to the Project site which requires notification to employees of the Contractor, Owner or its other contractors, suppliers, vendors, material men and/or local fire departments or other authorities, in conformance with applicable environmental, hazardous substance, right to know, or similar laws, the Construction Manager shall be provided with material safety data sheets to be available at the Project site for inspection and reference prior to delivery of such products or materials to the job-site. Contractor shall provide appropriate training for its job-site personnel. The Contractor shall maintain a hazardous material program, including proper placarding of all locations where hazardous materials are located, in conformance with the aforementioned laws.

7.4.18 ***Unsafe Acts***

Contractor's employees who report for work under the influence of intoxicants or narcotics or engage in the consumption of them on the Project site will be removed from the Project site. Contractor's employees who engage in horseplay, fistfights, unsafe acts, whistling, yelling at the public or obscene gestures will be removed from the Project site. Weapons of all types, including firearms, are strictly forbidden on the Project site.

7.4.19 ***Visitors***

All of Contractor's visitors to the Project site must check in with the Construction Manager's supervision prior to going on site.

7.4.20 ***Competent Person***

The Contractor shall identify their OSHA Competent Person for the work that they perform in either their written safety plan or in a memo form submitted at the beginning of work.

7.4.21 ***Project Site Communications***

Contractor shall have on site at all times a supervisor (or multiple supervisors if required by crew size) that is able to speak, understand and communicate in English all job site safety and contractual requirements, obligations and responsibilities to Contractor's workers and employees. Contractor shall require its' lower tier Contractors and suppliers to comply with this requirement and shall incorporate this section in its agreement with lower tier Contractors and suppliers.

7.4.22 ***Consent to Use of Drones***

Contractor and its employees consent to the use of an unmanned aerial system (UAS) at the Project site if approved by Construction Manager, and specifically to any UAS flyovers.

7.4.23 ***Hot Work Operations***

Hot work operations require the use of a permit.

Combustible Material: All portable combustible material must be removed a minimum of 20 feet away from the working area and adjoining areas.

Flammable Liquids or Vapors: Drums, tanks or other containers or explosive liquids or vapors must be cleaned and cleared of flammable or explosive liquids or vapors before work is done on them.

Pre-Operation Precautions: When feasible, work area should be wetted down.

Spark Control: Sheet metal guards, asbestos and similar protection must be provided to prevent hot metal and sparks from falling on combustible material which cannot be moved.

Fire Protection: If the area in which hot work operations are being performed is presently under operative sprinkler protection, the sprinklers in that area must be operative during welding or cutting operations. Suitable fire extinguishers or hand hose must be maintained near the operations. An extra person must be provided in the welding or cutting team whose sole responsibility is to watch for sparks and promptly use the extinguishing equipment.

Post-Operation Precautions: After work, a thorough check must be made for smoldering fire in out-of-the-way places, and guard patrol protection must be maintained for a minimum for one hour.

"Hot Work Operations" means:

The process whereby one or more of the parts to be joined is heated near of above its melting point, and the heated surfaces are caused to flow together.

The process of applying heat to bring to red heat the spot to be severed, gouged or pierced, and the metal is burned in a jet of oxygen;

Grinding operations that generate sparks;

Torch-on roofing operations;

Roof tarring operations.

7.4.24 ***Daily Stretch & Flex***

Contractor and its on-site crew (including sub-tier Contractors) will attend a daily stretch and flex to start each work day. All workers will meet at a central location on site for stretching and to review site logistics and/or other safety topics. Stretch and Flex will last for approximately 15 minutes. Construction Manager will facilitate the daily stretch and flex.

7.4.25 ***Daily JSA***

Contractor is responsible for pre-task planning, including filling out a daily Job Safety Analysis (JSA). The daily JSA is to be filled out each morning and reviewed with the Contractor's crew prior to the crew starting work. Contractor shall fill out additional JSA's during the day when conditions or tasks change. Contractor's foreman shall

review the JSA each morning with the crew and obtain signatures. Contractor's foreman to keep JSA's clean and organized in Contractor's trailer or gang box. Construction Manager will review the daily JSA's with the foreman on a periodic basis.

7.4.26 ***Ladders Last Program***

Contractor shall comply with Construction Manager's Ladders Last program. This specifically includes all costs to furnish lifts/scaffolding, etc. as required to meet the program requirements.

Ladders are to be the last choice for accessing elevated work areas. Alternative means of access shall be used whenever feasible. Alternate means of access may include:

- Scissors life
- Aerial lift
- Scaffolding (Baker, Perry or other rolling scaffold)
- Rolling stairs
- Stair towers

Extension ladders may be set up in one location and used for access between elevations for a period of no more than one week. If long term access is required (more than one week), a stair tower, stairway or personnel hoist shall be utilized.

At no time will work be performed from an extension ladder without a permit. The cost of alternate means of accessing the work area is not to be a factor when determining whether to issue a permit for working from an extension ladder. 100% fall protection is required if work is to be performed at height of 6' or more from an extension ladder.

Step ladders 8' or less are allowed to be used without a permit.

When step ladders are used, platform style step ladders are the preferred ladder.

The ladder use permit must be completed and approved by the project team for requests to use step ladders greater than 8' in height or extension ladders for a duration of greater than one week.

The ladder Permit will be affixed to all ladders while in use. The inspection safety checklist (on the back of the permit) will be completed prior to use. The ladder and safety inspection checklist will be completed by a competent person.

7.4.27 ***Prime Contractor Executive Engagement***

Each month a Prime Contractor Executive will be asked to attend the morning stretch and flex, address the jobsite workers with a safety message and conduct a jobsite walk. This responsibility will rotate through the Prime Contractors on the project. The Construction Manager will coordinate with the Prime Contractors to set up a rotation.

7.4.28 ***Behavior Based Safety***

Contractor agrees to participate in the project Behavior Based Safety program that includes training and observations

7.4.29 ***Safety Meetings – Level 1, 2 and 3***

Contractor shall participate in Level 1, 2 and 3 safety meetings. Level 1 meetings are the standard preconstruction meetings. Level 2 meetings are only required if/when during the Level 1 meeting a scope of work is identified to have a High Risk Activity (HRA) associated with it. Level 2 meetings will be held two weeks prior to the scope of work beginning. Contractor will be required to develop a Method of Procedure (MOP) and Sequence of Steps (SOS) for these HRAs. Level 3 meetings take place in the field just prior to the scope of work beginning.

7.4.30 ***Site Supervision***

Contractor shall have supervision on site anytime that a Contractor is on site. This includes supervision of work that is taking place by subtier-contractor/supplier of Contractor.

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Lump Sum allowances.

B. Administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements, and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
2. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 23 00 - Alternates: Coordinate Allowance No. 1 with Scope of Work Alternate No. 3 – Mechanical Piping Redundancy.

B. Divisions 02 through 49: Sections for items of Work covered by allowances.

1.03 LUMP SUM ALLOWANCES

A. Costs Included in Lump Sum Allowances: Unless otherwise noted, cost of product(s) to Contractor or subcontractor including delivery to project site, less applicable trade discounts, less applicable taxes.

B. Costs Not Included in Lump Sum Allowances: Unless otherwise noted, Contractor costs for product handling at the site, including unloading, uncrating and storage; protection of products from elements and from damage; labor for installation and finishing; and profit and overhead.

C. Construction Manager 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.
3. Prepare Change Order.

D. Contractor Responsibilities:

1. Assist Construction Manager in selection of products, suppliers, and installers.
2. Obtain proposals from suppliers and installers and offer recommendations.
3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

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

PART 2 PRODUCTS

2.01 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Construction Manager and Design Professional of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Construction Manager's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Design Professional from the designated supplier.

2.02 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
   1. If requested by Construction Manager, prepare unused material for storage by Owner when it is not economically practical to return the material for credit.
   2. If directed by Construction Manager, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 ALLOWANCES SCHEDULE

A. Allowance No. 1: Building HVAC Control System.
   1. Provide products as specified in **Division 23**, and as shown on the Drawings.
   2. Include all costs associated with coordination, preparation, mark-up, overhead, and profit for Contractor, or any subcontractor(s) other than Siemens, in Contractor's base bid sum, and not in this allowance.
   3. The stipulated base bid sum of $_____[amount will be noted in the last addendum] covers the purchase, delivery and installation of the HVAC control system.
   4. The stipulated add alternate sum of $_____[amount will be noted in the last addendum] covers the purchase, delivery and installation of the HVAC control system related to Alternate No. 3 – Mechanical Piping Redundancy.

B. Allowance No. 2: Building Access Control Security System.
   1. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.
   2. Include all costs associated with coordination, preparation, mark-up, overhead and profit for Contractor, or any subcontractor(s) other than Basepoint, in Contractor's base bid sum, and not in this allowance.
   3. The stipulated sum of $_____[amount will be noted in the last addendum] covers the purchase, delivery and installation of the building addition's access control security system.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittals for Review
B. Submittals for Information
C. Submittal Procedures
D. Samples

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 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
B. Submit to Construction Manager to forward to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
C. Samples will be reviewed only for aesthetic, color, or finish selection.
D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record document purposes.

3.02 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 Construction Manager, Architect, and Owner’s knowledge. No action will be taken.

3.03 SUBMITTAL PROCEDURES

A. Submittals will be electronically submitted through Procore. Contractor will be invited to join web based program after issue of Notice of Intent to award.
B. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
   2. Do not reproduce the Contract Documents to create shop drawings.

3. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.

C. Transmit each submittal with a copy of approved submittal form.

D. Sequentially number the submittal form. Revise submittals with original number and a sequential numeric suffix.

E. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

F. 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.

G. Schedule submittals to expedite the project and coordinate submission of related items.

H. **Contractor shall proactively procure submittals upon receipt of a Notice of Intent (NOI) for the project. Contractor can begin uploading submittals to ProCore once the NOI is issued. Submittals shall be uploaded to ProCore within three (3) weeks of receiving an executed prime contract. Construction Manager will coordinate with the Architect and other Design Consultants to prioritize review of submittals. Contractor shall clearly communicate associated lead times for each submittal to aid in prioritizing review. Contractor understands the submittal workload must be leveled and therefore other submittals may receive a higher priority and be processed ahead of Contractor's submittals. Quality submittals are expected and the Construction Manager, Architect & Design Consultants reserve the right to return a submittal without review if it is deemed low quality or too incomplete to warrant reviewing. The review period for each submittal shall not exceed three (3) working weeks. Only one (1) resubmittal will be accepted, with a review period not to exceed two (2) weeks from the date of receipt. If it is anticipated that the submittal process may require multiple resubmittals, the Construction Manager (CM) and designer shall conduct a page-turn review with the contractor and relevant suppliers following completion of the initial submittal review to expedite the process and ensure full alignment prior to the first resubmittal. Identify variations from the Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.**

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

L. Contractor shall prepare a submittal log to capture the Contractor's and any subcontractor or supplier submittals required by the contract documents. Contractor shall submit the log to the Construction Manager within (3) weeks of receiving a Notice of Intent for the project.

3.04 SAMPLES

A. Submit to Construction Manager to forward to Architect/Engineer for review for limited purpose for checking conformance with information given and design concept expressed in the Contract Documents.

B. Samples for selection as specified in product sections:

1. Submit to Construction Manager to forward to Architect/Engineer for aesthetic, color, or finish selections.
2. Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns to Construction Manager to forward to Architect/Engineer for selection.

C. Submit samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

D. Include identification on each sample, with full project information.

E. Submit number of samples specified in individual specification sections.

F. Photograph of submitted samples, along with transmittal sheet, shall be uploaded as a submittal

in Procore.

END OF SECTION

SECTION 013546
INDOOR AIR QUALITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Indoor Air Quality (IAQ) management procedures during construction operations.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 23 - HVAC for coordination with HVAC requirements.

1.03 REFERENCE STANDARDS

A. ANSI/SMACNA 008-2008 - "IAQ Guidelines for Occupied Buildings Under Construction", Second Edition, 2007, Chapter 3, The Sheet Metal and Air Conditioning National Contractors Association (SMACNA), www.smacna.org.

B. ANSI/ASHRAE 52.2-2017 - "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size", www.ashrae.org.

1.04 PURPOSE

A. The intent of Construction Indoor Air Quality (IAQ) management is to reduce indoor air quality problems resulting from the construction process and promote the well-being of construction workers and building occupants.

1.05 PERFORMANCE REQUIREMENTS

A. Construction Indoor Air Quality Procedures: During construction, comply with the following requirements:
   1. Meet or exceed the minimum requirements of the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, Second Edition, November 2007, Chapter 3.
   2. Do not allow smoking in enclosed portions of the project site, on the rooftop, in construction trailers, or within 25 feet of building entries, outdoor air intakes, and operables.
      a. This prohibition includes tobacco smoke, smoke produced from combustion of cannabis and controlled substances, and the emissions produced by electronic smoking devices.
   3. Protect absorptive materials stored on-site and installed from moisture damage. Do not install water-damaged materials in the building.
   4. If permanently installed **new or existing** air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-2017. Replace filtration media immediately prior to occupancy, according to Division 23 - HVAC.

1.06 SUBMITTALS

A. With first Application for Payment, the Construction Manager shall submit a draft Construction IAQ Management Plan. Architect will return plan with revisions or approval, to be resubmitted as many times as necessary for Architect's final approval. The plan shall be divided into 6 parts, addressing each of the following topics per "IAQ Guidelines for Occupied Buildings Under Construction", Sheet Metal and Air Conditioning Contractors' National Association (SMACNA); http://www.smacna.org/ ; (703) 803-2980. The plan shall also include requirements described in "Performance Requirements" above.
   1. HVAC protection
   2. Source Control

3. Pathway Interruption
4. Housekeeping
5. Scheduling
6. Smoking Policy
7. Moisture Control
8. Filter Maintenance Schedule

B. With subsequent Applications for Payment, the Construction Manager is to submit documentation of IAQ procedures as follows:
   1. Provide cut sheets of filtration media used during construction with MERV values highlighted (per ANSI/ASHRAE 52.2-2017). Fresh clean filters must be installed immediately prior to occupancy.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CONSTRUCTION IAQ MANAGEMENT PLAN IMPLEMENTATION

A. Contractor IAQ Manager: The Contractor shall designate an on-site person responsible for instructing workers and overseeing and documenting results of the Construction IAQ Management Plan for the Project.
   1. Distribution: The Contractor shall distribute copies of the Construction IAQ Management Plan to the Job Site Foreman, each contractor, the Owner, and the Architect.
   2. Instruction: The Contractor shall provide on-site instruction of appropriate procedures and methods to be used by all parties at the appropriate stages of the Project.

B. During construction operations, follow the recommendations in SMACNA IAQ Guidelines for Occupied Buildings under Construction.

C. HVAC Protection:
   1. Seal the ends and openings of ductwork upon arrival at site. Seals shall be repaired or replaced as necessary to maintain continuous protection throughout construction.
   2. Store ductwork on pallets or dunnage until installed.
   3. Seal return registers during construction operations.
   4. Provide temporary exhaust during construction operations.
   5. To the greatest extent possible, isolate and/or shut down the return side of the HVAC system during construction. When ventilation system must be operational during construction activities, provide temporary filters.
   6. Do not store construction or waste materials in mechanical rooms with return-side equipment.

D. Source Control:
   1. Provide low and zero VOC materials as specifed, in accordance with Section 160000 - Product Requirements.
   2. Reduce VOC emissions by sealing or covering possible sources of emissions.
   3. Store solvent-contaminated rags in closed, flame-proof containers.

E. Pathway Interruption:
   1. Isolate areas of work as necessary to prevent contamination of clean or occupied spaces.
   2. Provide pressure differentials and/or physical barriers to protect clean or occupied spaces.

F. Housekeeping:
   1. During construction, maintain project and building products and systems to prevent contamination of building spaces.
   2. Employ green housekeeping methods wherever practicable.
      a. Use non-toxic cleaners per Green Seal: http://www.greenseal.org/

G. Temporary Ventilation:
   1. Provide adequate ventilation during and after installation of interior wet products and interior final finishes.

2. Directly exhaust pollution sources to the outside to minimize accumulation of odors and VOC emissions during construction.
3. If **new or existing** permanent building HVAC systems are used to supply the ventilation air, provide filtration media **at each return grille** with a Minimum Efficiency Reporting Value (MERV) of 8 as determined by ASHRAE 52.2 during construction. Coordinate with work of Division 23 (15), Heating Ventilating and Air Conditioning (HVAC). Fresh clean filters must be installed immediately prior to occupancy in accordance with Division 23 - HVAC.

H. Scheduling:
1. Schedule construction operations involving wet products prior to packaged dry products to the greatest extent possible.
2. Schedule work such that absorptive materials, including but not limited to porous insulations, paper-faced gypsum board, ceiling tile, and finish flooring, are not installed until they can be protected from rain and construction-related water.

I. Moisture Control:
1. Keep materials dry. Protect stored on-site and installed absorptive materials from moisture damage.
2. Verify that installed materials and products are dry prior to sealing and weatherproofing the building envelope.
3. Install interior absorptive materials only after building envelope is sealed and weatherproofed.

J. Smoking Policy:
1. Enforce the no-smoking policy inside the building and within 25 feet of building openings.
2. Locate exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes, and operable windows.Provide signage for designated smoking areas. Provide ash receptacles and clean areas daily.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Inspections
B. Substantial Completion
C. Project Record Documents
D. Warranties
E. Operations and Maintenance Manuals
F. Operations and Maintenance Data for Materials and Finishes
G. Operations and Maintenance Data for Equipment and Systems
H. Training
I. Final Completion
J. Maintenance

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 INSPECTIONS

A. Ensure all state inspections have been completed by the authority having jurisdiction.
B. Upload documentation of all test/inspections to Procore.
C. Submit a written request for inspection of Substantial Completion. On receipt of request, The Design Professional will either proceed with inspection or notify contractor of unfulfilled requirements. The Design Professional will prepare the Certificate of Substantial Completion after inspection or will notify contractor of items, either on contractor's list or additional items identified by architect that must be completed or corrected before certificate will be issued.
    1. Re-inspection: Request re-inspection when the work identified in previous inspections as incomplete is completed or corrected.
    2. Results of completed inspection will form the basis of requirements for Final Completion.

3.02 SUBSTANTIAL COMPLETION

A. A substantial completion checklist is attached for reference following this specification section.
B. Make submittals that are required by governing or other authorities.
    1. Provide copies to the Construction Manager through uploading them to Procore.
C. Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
    1. Submit written certification that contract documents have been reviewed, work has been inspected, and that work is completed in accordance with contract documents and ready for review
    2. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the work has not been completed.
    3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
    4. Make final changeover of permanent locks and deliver key to the owner. Advise owner's personnel of changeover in security provisions.
    5. Complete startup testing of systems.
    6. Submit test/adjust, balance records.
    7. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.

8. Advise owner of changeover in heat and other utilities.
9. Submit changeover information related to owner's occupancy, use, operation, and maintenance.
10. Complete final cleaning requirements, including touch up painting.
11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

3.03 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
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, not less than weekly.
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 alterations utilized.
   3. Changes made by Addenda and modifications.
F. Record Drawings:
   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.
G. Record Drawings shall be uploaded to Procore in pdf format.

3.04 WARRANTIES

A. Submit written warranties for designated portions of the work where commencement of warranties other than date of Substantial Completion is indicated.
B. Submit properly executed warranties in Procore prior to Final Completion.
C. Verify that documents are in proper form, contain full information, and are notarized.
D. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
E. Include warranties in operation and maintenance manuals.
F. Items of work delayed beyond date of Substantial Completion, provide updated submittal after acceptance by Owner, listing date of acceptance as start of warranty period

3.05 OPERATIONS AND MAINTENANCE MANUALS

A. Format: Submit operations and maintenance manuals in the following format:
   1. Portable Document Format (PDF) electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Owner and upload to Procore.
      a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.

2. Assemble with data arranged in the same sequence as, and identified by the specification sections. Where systems involve more than one specification section, provide separate index for each system.
3. Include project directory listing title and address of project, names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
4. Include Table of Contents listing every item separated by index and specification section.

B. Source Data: For each product or system, list names, addresses, and telephone numbers of subcontractors and suppliers, including local sources of supplies and replacement parts.

C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

D. 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.

E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.06 OPERATIONS AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For each product, applied material, and finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

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. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. 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 specified products.

3.07 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 replacement 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 specified products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. 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.

F. Maintenance requirements: Include routine procedure and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

G. Provide servicing and lubrication schedule and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
K. Provide control diagrams by controls manufacturer as installed.
L. Provide contractor's coordination drawings, with color coded piping diagrams as installed.
M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
O. Include test and balancing reports.
P. Additional requirements: As specified in individual specification sections.

3.08 TRAINING

A. Demonstrate operations of systems, subsystems, and equipment.
B. Train in operation and maintenance of systems, subsystems, and equipment
C. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
D. Submit written agenda to Construction Manager for approval prior to scheduling training.
E. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

3.09 FINAL COMPLETION

A. A final completion checklist is attached for reference following this specification section.
B. Before requesting final inspection for determining date of Final Completion, complete the following:
    1. Complete punch list items.
    2. Prepare and submit project record documents, operation and maintenance manuals, damage or settlement surveys, and similar final record information.
    3. Deliver tools, spare parts, extra materials, and similar items to location designated by owner. Label with manufacturer's name and model number where applicable.
    4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
    5. All trailers, construction signs, unused, broken or demolition materials have been removed from the site and the premises returned to the original condition in the opinion of the Owner and Design Professional.
    6. Submit a final Application for Payment (retainage).
C. Upon receipt of final payment complete final completion certificate in Procore.

END OF SECTION

Substantial Completion Project Checklist

Date: _____

DAS Project Number: _____
Project Title: _____
Location: _____
Contractor: _____

In order to process the 99% payment (100% pay app less closeout and retainage) on a Capital Project, the Department of Administrative Services needs the following information. Please complete this form and obtain the necessary documents.

Have all state inspections been completed and documentation uploaded to Procore?
(Including but not limited to the following inspections)

Boiler Inspection	❑ **Yes**	❑ **No**	❑ **N/A**
Water Heater Inspection	❑ **Yes**	❑ **No**	❑ **N/A**
Energy Code Inspection	❑ **Yes**	❑ **No**	❑ **N/A**
Building Code Inspection	❑ **Yes**	❑ **No**	❑ **N/A**
Electrical Inspection	❑ **Yes**	❑ **No**	❑ **N/A**
Elevator Inspection	❑ **Yes**	❑ **No**	❑ **N/A**
Other: _____	❑ **Yes**	❑ **No**	❑ **N/A**

❑ **Occupancy Permit if applicable**

❑ **Test and Balance has been performed**

❑ **Certificate of Substantial Completion in Procore (Consensus Docs 814)**

Are there any disputes with the above mentioned vendor which need resolution?
❑ **Yes (provide description below)** ❑ **No**

_____
_____

Can payment (less closeout and retainage) be released? ❑ **Yes** ❑ **No**

Final Completion Project Checklist

Date: _____

DAS Project Number: _____
Project Title: _____
Location: _____
Contractor: _____

In order to process the 100% payment and Retainage payment on a Capital Project, the Department of Administrative Services needs the following information. Please complete this form and obtain the necessary documents.

Have all Warranties been received? ❑ Yes ❑ No

Have the Operations and Maintenance Manuals been received? ❑ Yes ❑ No

Who is in possession of the O & M Manuals? _____

Has all training been completed? ❑ Yes ❑ No

Have all as-built drawings been scanned and uploaded into Procore? ❑ Yes ❑ No

Have electronic drawing/specification files been transferred to DAS? ❑ Yes ❑ No

Have all Test & Balance reports been received? ❑ Yes ❑ No

Have all punchlist items been corrected? ❑ Yes ❑ No

❑ **573 Notification** *(To be obtained from the general contractor):* Copy of general contractor's notification of application for retainage to all subcontractors and suppliers. General contractor must follow IAC 26 section 23.13.2.

❑ **AIA Form G706 – Contractor's Affidavit of Payment of Debts and Claims**

❑ **AIA Form G706A – Contractor's Affidavit of Release of Liens**

❑ **AIA Form G707 – Consent of Surety Company to Final Payment**

❑ **Certificate of Final Completion in Procore (Consensus Docs 815)**

Are there any disputes with the above mentioned vendor which need resolution?
❑ Yes (provide description below) ❑ No

_____

_____

Can 100% payment and retainage payment be released? ❑ Yes ❑ No

SECTION 03 54 00
CAST UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.
   1. Use cementitious type.

1.02 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens).

B. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, 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. **BASIS OF DESIGN:** Mapei Corporation; Self-Leveler Plus: www.mapei.com/#sle.
   2. **Maxxon; Level EZ: www.maxxon.com**
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Cast Underlayments, General:
   1. Comply with applicable code for combustibility or flame spread requirements.

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 4200 pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2. Density: 128 pounds per cubic foot, nominal.
   3. Final Set Time: 4 hours, minimum.
   4. Thickness: Capable of thicknesses from feather edge to maximum 1 inch.
   5. 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.

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. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.

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.

END OF SECTION

SECTION 05 51 33
METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop-fabricated metal ladders.

1.02 RELATED REQUIREMENTS

A. Section 05 51 00 - Metal Stairs.

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

I. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

K. AWS D1.1/D1.1M - Structural Welding Code - Steel.

L. AWS D1.2/D1.2M - Structural Welding Code - Aluminum.

M. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172.

N. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer.

O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).

P. SSPC-SP 2 - Hand Tool Cleaning.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, 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.

C. Welders' Qualification Statement

D. Environmental Product Declarations.

1.05 QUALITY ASSURANCE

A. Design attachments 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. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

D. Contractor to take field measurements prior to shop drawings and fabrication.

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. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

F. Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153/A153M where connecting galvanized components.

G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

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.

2.02 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. Continuously seal joined members by continuous welds.

D. 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.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 LADDERS

A. Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Contractor to field verify locations, heights and mounting conditions.

B. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.

C. Mounting:

1. Off-floor mount fixing bracket, heavy duty wall fixing bracket for ladders mounted to the wall only.

D. Fixed Vertical Ladder Construction:
1. Side Rails: 3/8 by 2 inches members spaced at 20 inches. Extend 42-inches above top landing.
2. Rungs: One inch diameter solid round bar spaced 12 inches on center.
3. Space rungs 7 inches from wall surface.
4. Width: 23 1/2 inches.
5. Capacity: 330 lbs.

E. Ladder Fabrication:
1. Weld all components.
2. Provide handrails of 1-1/4 in round tubing.
3. Furnish ladder with mounting brackets, one every four feet minimum.
4. Install top of the top rung, level with top of access/egress level or landing platform, served by the ladder stepping-off surface.
5. Bottom rung height from lower surface to be confirmed with owner prior to fabrication.
6. At parapet ladder, provide post extensions with vertical handrails.

F. Manufacturers (steel):
1. Cotterman; www.cotterman.com
2. FS Industries; www.fsindustries.com
3. National Ladder & Scaffold Co.; www.nationalladder.com
4. **O'Keeffe's Inc; www.okeeffes.com**
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 FINISHES - STEEL

A. Prime paint steel items.
1. Do not prime surfaces in direct contact with concrete.
2. Do not prime surfaces where field welding is required.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

F. See Finish Schedule for paint finish.

2.05 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.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments. Coordinate blocking in stud wall for bracket attachment.

C. Field weld components as indicated on shop drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 07 05 43
CLADDING SUPPORT SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cladding support systems, directly attached to substrates.

1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing.

B. Section 06 16 00 - Sheathing.

C. Section 07 21 00 - Thermal Insulation.

D. Section 07 27 00 - Air Barriers.

E. Section 07 42 13 - Metal Wall Panels.

1.03 DEFINITIONS

A. Continuous Insulation: As defined by ASHRAE Std 90.1 I-P.

1.04 REFERENCE STANDARDS

A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate cladding support system manufacturer's requirements with requirements of exterior structural wall assemblies and cladding system.

B. Preinstallation Meetings:
   1. Schedule meeting to occur after final approval of submittals by Architect.
   2. Agenda: Review exterior structural wall assembly requirements, cold-formed metal framing minimum thickness requirements, cladding support system rail layout, cladding layout, cladding fastening requirements, unique details, construction scheduling, construction sequencing, and potential interference and conflicts with adjacent construction.
   3. Required Attendees: Contractor, cladding support system subcontractors, cladding subcontractors, and exterior structural wall assembly subcontractors.
   4. Invited Attendees: Owner and Architect.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Product Data: Manufacturer's published descriptive data, including product attributes.
   1. Include data for cladding support system and wall fasteners.

C. Shop Drawings: For each cladding support system; indicate:
   1. Elevations, Sections, and Plans: Include column centers, elevations, and dimensions; indicate locations of system components, component spacings, wall claddings, exterior wall assembly substrates, and wall fasteners.
      a. Drawing Scale: 1/8 inch to 1 foot, minimum.
   2. Details: Connection details between cladding support systems and substrates; indicate fastener size and spacing.
      a. Drawing Scale: 1-1/2 inches to 1 foot, minimum.

D. Certificate: Certify cladding support systems of this section meet or exceed specified design criteria.

E. Delegated Design Documents: Submit for information, signed and sealed documents by engineer of record responsible for comprehensive design package of cladding system, including wall fasteners and anchors. Submit structural design, rail spacing, rail frequency, rail orientations, calculations, and other documentation sufficient to comply with structural design criteria of this section.

F. Design Data: Submit for information, project-specific thermal performance values for above-grade walls; prepared by professional engineer; substantiate values based on alternative compliance methods described in ASHRAE Std 90.1 I-P and acceptable by AHJ.
   1. Submit comprehensive, three-dimensional, thermal modeling report indicating framing system's impact on continuous insulation U-factors.

G. Designer's qualification statement.

H. Specimen warranty.

1.07 QUALITY ASSURANCE

A. Designer Qualifications for Contractor's Design-Related Professional Design Services: Qualified professional structural engineer experienced in design of cladding support systems and licensed in the State in which the Project is located.

B. Designer Qualifications: Qualified professional structural engineer experienced in design of cladding support systems, associated wall fasteners and anchors, and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

D. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.

1.08 MOCK-UPS

A. See Section 01 43 39 - Mockup Requirements for additional requirements.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site in wrapped, protected, unbroken packaging with product identification labeling.

B. Store products under cover and elevated above grade.

C. Handle products without damaging; prevent bending, warping, and twisting to surfaces, edges, or corners.

1.10 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Manufacturer's Special Warranty: Provide 10-year warranty for cladding support system components, including structural failure of components, commencing on Date of Substantial Completion. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. **BASIS OF DESIGN:** Advanced Architectural Products, LLC: www.smartcisystems.com/#sle.

B. Cladding Corp: www.claddingcorp.com/#sle.

C. Substitutions: See Section 01 60 00 - Product Requirements.

D. Source Limitations: Provide complete cladding support system including wall fasteners and wall anchors from single manufacturer.

2.02 PERFORMANCE CRITERIA

A. Surface Burning Characteristics: Provide cladding support systems with a flame spread index (FSI) of 25 or less, and a smoke developed index (SDI) of 450 or less, when tested in accordance with ASTM E84 or UL 723.

2.03 DESIGN CRITERIA

A. See Section 01 40 00 - Quality Requirements for additional information.

B. Structural Design Services: Provide Contractor's design-related professional services for structural design of cladding support systems based on the following criteria:
   1. Design Loads: Exterior wall design loads as indicated on structural drawings.
   2. Fastener Design Criteria: As indicated on drawings.
   3. Thermal Movement Design Criteria: Cladding systems allow for thermal movements without overstressing components and evidence of permanent component defects, based on maximum ambient temperature of 120 degrees F.

2.04 EXTERIOR WALL ASSEMBLIES WITH CLADDING SUPPORT SYSTEMS

A. Cladding: See Section 07 42 13.

B. Depth of Air-Gap Cavity: As indicated on drawings.

C. Cladding Support System Applications:
   1. Direct-attached-to-substrate cladding support systems.

D. Exterior Continuous Thermal Insulation:
   1. See Section 07 21 00.
   2. Depth of Insulation: As indicated on drawings.

E. Air Barriers: See Section 07 27 00.

F. Sheathing: See Section 06 16 00.

2.05 CLADDING SUPPORT SYSTEMS, DIRECTLY ATTACHED TO SUBSTRATE

A. Z-Shaped, Thermally Improved Fiber-Reinforced Polymer (FRP) Girts With Steel Inserts:
   1. Description: Z-shaped, FRP girts with outboard and inboard faces; reinforced with integral, continuous, zinc-coated, steel sheet inserts.
   2. Attachment to Substrate: Girts penetrate continuous insulation; wall fasteners attach inboard faces of girts to exterior wall assemblies.
   3. Steel Inserts: Zinc-coated steel sheets.
      a. Thickness: 16 gauge, 0.060 inch, minimum.
   4. Girt Depth: As indicated on drawings.
   5. Orientation: As indicated on drawings.
   6. Rail Spacing: As indicated on drawings.
   7. Products:
      a. **BASIS OF DESIGN:** Advanced Architectural Products, LLC; GreenGirt CMH System: www.greengirt.com/#sle.
      b. Strongirt; www.strongirt.com
      c. **Knight Wall Systems MFI: www.knightwallsystems.com**
      d. **Cladiator; Slotted Z: www.cladiator.com**
      e. **Exo Girt; Z Girts: www.exo-girt.com**
      f. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 MATERIALS

A. Fiberglass Reinforced Polymer (FRP):
   1. Polyester resin matrix with recycled materials and fire-retardant additives; reinforced with glass strand rovings for longitudinal strength and continuous strand glass mats or stitched reinforcements for transverse strength.

2.07 FABRICATION

A. Shop fabricate to greatest extent possible.

2.08 ACCESSORIES

A. Miscellaneous Nonstructural Accessories: Provide nonstructural accessories; flashings, sealants, tapes, and shims as recommended by manufacturer, suitable for project-specific applications, and compatible with system components.

B. Metal Accessories: Provide transition units as recommended by manufacturer, suitable for project-specific applications, and compatible with system components.

C. Miscellaneous Thermal Isolation Accessories: Manufacturer's thermoplastic shims that do not decrease thermal or structural system performance, thickness, shape, and structural compressive strength suitable for project-specific applications.

D. Fasteners Between Claddings and Cladding Support Systems:
   1. Standard self-tapping metal screws.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. Verify substrates comply with contract documents, including specified tolerances, and are ready to receive work of this section.
   2. Verify air barrier, wall flashing, and rigid insulation work comply with contract documents.

B. Do not commence installation until noncompliant conditions have been corrected.

3.02 PREPARATION

A. Protection of In-Place Conditions: Protect air barrier work from damage.

B. Surface Preparation:
   1. Prepare substrate surfaces using methods in accordance with cladding support system manufacturer's written instructions.
   2. Clean substrate surfaces before commencement of cladding support systems.

3.03 INSTALLATION

A. Installation of Cladding Support System Substrates.
   1. See Section 05 40 00 for installation of cold-formed, steel-stud framing wall substrates.

B. Install cladding support systems in accordance with manufacturer's written instructions.

C. Installation of Wall Fasteners in Cold-Formed Metal Framing Cold-Formed Metal Framing Wall Substrates: Install fasteners in accordance with manufacturer's published installation instructions and manufacturer's published installation instructions.

D. Installation of cladding systems:
   1. See Section 07 42 13 for installation of metal wall panels.

3.04 TOLERANCES

A. Install cladding support systems plumb with noncumulative maximum variation of:
   1. 1/4 inch in 20 feet.

B. Install cladding support systems level with noncumulative maximum variation of:
   1. 1/4 inch in 20 feet.

3.05 CLEANING

A. See Section 01 73 00 - Execution for additional requirements.

3.06 PROTECTION

A. Protect installed cladding support systems from subsequent construction operations.

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 01 91 19 - Building Enclosure Commissioning.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with air barriers.

C. Section 07 92 00 - Joint Sealants: Sealant Materials.

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 D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.

B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.

E. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials.

F. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials.

G. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Product Data: Provide data on material characteristics, performance criteria, and limitations.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

E. Environmental Product Declaration.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

C. Manufacturer Inspection: Provide a field visit by manufacturer's representative after installation and before work is covered up.

1.07 MOCK-UPS

A. See Section 01 43 39 - Mockup Requirements for additional requirements.

1.08 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)

A. Air Barrier Sheet, Self-Adhered:
   1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
   3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 150 days of weather exposure.
   4. 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.
   5. Comply with NFPA 285 requirements for wall assembly.
   6. Seam and Perimeter Tape: All seams, gaps, and perimeter taped before air barrier application.
   7. Products:
      a. 3M Company: www.3M.com/construction
      b. Carlisle Coatings and Waterproofing, Inc: www.carlisleccw.com/#sle.
      c. GCP Applied Technologies: www.gcpat.com/#sle.
      d. Henry Company: www.henry.com/#sle.
      e. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.

B. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing.
   1. Air Barrier Coating:
      a. Material: one component, polymer modified, cold applied liquid membrane.
      b. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
      c. Water Vapor Permeance: 5 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. Elongation: 250 percent, minimum, when tested in accordance with ASTM D412.
      f. 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.
      g. Comply with NFPA 285 requirements for wall assembly.
      h. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
      i. VOC Content: 40g/L - Low VOC Version
      j. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
      k. Products:
         1) 3M Company; 3015VP: www.3M.com/construction/#sle.
         2) Carlisle Coatings and Waterproofing, Inc; Barritech-VP: www.carlisleccw.com.
         3) GCP Applied Technologies; Perm-A-Barrier Liquid VP: www.gcpat.com/#sle.
         4) Henry Company; Air-Bloc 17MR: www.henry.com/#sle.
         5) Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
         6) **Dow; DEFENDAIR 200C: www.dow.com**
         7) **TK Products; AirMax 2104VP: www.tkproducts.com**
         8) Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACCESSORIES

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.

B. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.

C. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrate and air barrier materials.
   1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch, nominal thickness.

D. Flexible Flashing: Self-adhering or mechanically-attached flashing used for wall penetrations in accordance with ICC-ES AC148 requirements.

E. Preformed Transition Membrane: Semirigid silicone or polyester composition, tapered edges, tear resistant.

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 Architect of unsatisfactory conditions.

C. Do not proceed with this work until unsatisfactory conditions have been corrected.

D. Existing air barrier type is unknown, verify compatibility when uncovered.

3.02 PREPARATION

A. Joint Treatment:
   1. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air-barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
      a. Prime substrate and apply a single thickness of air-barrier manfacturer's recommended preparation coat extending a minimum of 3 inches along each side of joints and cracks. Apply a double thickness of fluid air-barrier material and embed a joint reinforcing strip in preparation coat.
   2. Gypsum Sheathing: Fill joints greater than 1/8 inch with sealant according to ASTM C 1193 and air-barrier manufacturer's written instructions. Apply first layer of fluid air-barrier material at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air-barrier material over joint reinforcing strip.

B. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

C. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.

D. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

E. Verify that masonry joints are flush and completely filled with mortar and all masonry anchors installed before air barrier application.

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.
3. Overlap fluid-applied air barrier 2" onto self-adhering flashings typical.

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 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.
3. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
4. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
5. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements and 01 91 19 Commissioning of Building Enclosure (BECx) for additional requirements.

B. Owner will provide testing services, and Contractor to provide temporary construction and materials for testing, temporary construction, materials, and repairs for testing.

C. Do not cover installed air barriers until required inspections have been completed.

D. Take digital photographs of each portion of installation prior to covering up air barriers.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 07 42 13
METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured metal panels for walls and soffits (MP1, MP2, MP3, MP4, MP5), with related flashings and accessory components.

1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Wall framing.

B. Section 07 05 43 - Cladding Support Systems

C. Section 07 21 00 - Thermal Insulation: Insulation within subframing system

D. Section 07 27 00 - Air Barriers: Air barrier under wall panels.

E. Section 07 62 00 - Sheet Metal Flashing and Trim: Head, cap, stepped and base flashings; miscellaneous metal trim.

F. Section 07 92 00 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

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).

B. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.

C. Shop Drawings: Indicate dimensions, layout, joints, construction details, and methods of anchorage.
   1. Indicate on roof plan field, perimeter, and corner zone locations and widths. Indicate adhesive pattern requirements for field, perimeter, and corner zones.
   2. Indicate deck board fastening pattern requirements for field, perimeter, and corner zones.

D. Delegated Design Documents: Submit for information, signed and sealed documents by engineer of record responsible for comprehensive design package of cladding system, including wall fasteners and anchors. Submit structural design, calculations, and other documentation sufficient to comply with structural design criteria of this section

E. Samples: Submit two samples of wall panel, 12 inch by 12 inch in size illustrating finish color, sheen, and texture.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Qualified professional structural engineer experienced in design of cladding support systems, associated wall fasteners and anchors, 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 minimum five years of documented experience.

C. Installer Qualifications: Company specializing in installing products of the type specified in this section and approved by manufacture

1.06 MOCK-UPS

A. See Section 01 43 39 - Mockup Requirements for additional requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

1.08 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Correct defective work within a twenty year period after Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide Basis of Design manufacturer listed below, or a standard or custom product from another manufacturer, approved prior to bid, with equivalent performance, material properties, features, general configuration, appearance, and warranty:

B. Metal Panels - Exposed Fasteners (MP4, MP5):
   1. Centria; BR5-36: www.centria.com/#sle.
   2. McElroy Metal; Mega-Rib Panel: www.mcelroymetal.com/#sle.
   3. **BASIS OF DESIGN (MP4, MP5):** Morin Corporation; Exposed Fasteners Profile Y-36B : www.morincorp.com/#sle.
   4. **Peterson Pac Clad; 7.2 Panel**
   5. Substitutions: See Section 01 60 00 - Product Requirements.

C. Metal Panels - Concealed Fasteners (MP3):
   1. Dimensional Metals; FP1008.
   2. MetlSpan a Nucor Company; IW-10A.
   3. **BASIS OF DESIGN (MP3):** Morin Corporation; Concealed Fasteners F-8-0 : www.morincorp.com/#sle.
   4. PAC-CLAD | Petersen Aluminum Corporation; Flush Wall Panels: www.pac-clad.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

D. Metal Panels - Concealed Fasteners (MP1, MP2):
   1. Bamco.
   2. DriDesign.
   3. Metal Design Systems.
   4. Metalwerks.
   5. Pohl Aluminum Metal Plate System.
   6. Sobotec.
   7. **BASIS OF DESIGN (MP1, MP2):** Zeeff Panels; Origin Select: www.zeeffpanels.com.
   8. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 METAL PANEL SYSTEM

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Provide exterior panels and soffit panels.
   2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
   3. Design Pressure: In accordance with pressures indicated in Structural Notes.
   4. Maximum Allowable Deflection of Panel: L/ 120 for length(L) of span.

5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
8. Corners: Factory-fabricated in one continuous piece with minimum 18 inch returns.

B. Exterior Wall Panels (MP1, MP2):
1. Profile: Horizontal; style as indicated.
2. Seams: with interconnecting side joints, sealed with continuous bead of sealant.
3. Material: Precoated aluminum sheet, 12 gage, 0.080 inch minimum thickness.
4. Panel Width: varies, refer to elevations.
5. **Panel depth: 1-1/4 inches and 6 inches where shown on drawings.**
6. Panel Reveals: 5/8 inch nominal.
7. Color: Custom, As indicated on drawings on Metal Panel Types.
8. Coping at MP1 and MP2 to be metal panel manufacturers pre-finished coping.

C. Exterior Wall Panels (MP3):
1. Profile: Horizontal; style as indicated.
2. Side Seams: with interconnecting side joints, sealed with continuous bead of sealant.
3. Material: Precoated aluminum sheet, 18 gage, 0.0403 inch minimum thickness.
4. Panel Width: 8 inches nominal.
5. Panel depth: 1-1/2 inches nominal.
6. Color: Custom, As indicated on drawings on Metal Panel Types.

D. Soffit and Wall Panels (MP4, MP5):
1. Profile: Style as indicated.
2. Soffit Profile: Vented and solid as indicated.
3. Material: Precoated steel sheet, 24 gauge, 0.024 inch minimum thickness.
4. Panel Width: 36 inches nominal.
5. Panel Depth: 1-1/2 inches nominal.
6. Color: Custom, As indicated on drawings on Metal Panel Types.

E. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

F. Trim, Closure Pieces, Caps, and Flashings: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

G. Anchors: Galvanized steel.

2.03 MATERIALS

A. Recycled Content: provide metal materials with a minimum recycled content of 25 percent.

B. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS)) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

C. Precoated Aluminum Sheet (wall panels): ASTM B209 (ASTM B209M), 3003-H14 alloy smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.04 FINISHES

A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.

B. Panel Backside Finish: Panel manufacturer's standard polyester or siliconized polyester wash coat.

C. 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, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color as indicated on drawings and above.
   1. Products:
      a. Arkema, Inc; Kynar 500: www.arkema.com/#sle.
      b. PPG; Duranar: www.ppgmetalcoatings.com/#sle.
      c. Sherwin-Williams Company; Fluropon: www.coil.sherwin.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 ACCESSORIES

A. Cladding Support System: See Section 07 05 43

B. General: Provide complete metal wall panel assembly incorporating trim, copings, fasciae, parapet caps, soffits, sills, inside and outside corners, and miscellaneous flashings. Fabricate accessories in accordance with SMACNA Manual. Provide manufacturer's factory-formed clips, shims, flashings, gaskets, lap strips, closure strips, and caps for a complete installation.

C. Sealants: Specified in Section 07 92 00. Manufacturer's standard type suitable for use with installation of system; non-staining; color as selected.
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
   3. Seam Sealant: Factory-applied, non-skinning, non-drying type.

D. Fasteners: Self-tapping 300 series stainless steel screws, No. 14 minimum, hex-head, and other acceptable fasteners recommended by panel manufacturer. Exposed fasteners same finish as panel system.

E. Field Touch-up Paint: As recommended by panel manufacturer.

F. Bituminous Paint: Asphalt base.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support framing members are ready to receive panels.

B. Confirm that wall substrate is within tolerances acceptable to metal wall panel system manufacturer. Maximum substrate and framing deviations from flat plane acceptable:
   1. 1/4-inch in 20 feet vertically or horizontally.
   2. 1/2-inch across building elevation.
   3. 1/8-inch in 5 feet.

C. Openings: Verify that openings and penetrations match layout on shop drawings.

D. Verify air barrier, see Section 07 27 00, has been installed over wall panel substrate; see Section 061600.

E. Very cladding support system has been installed to tolerances indicated, as shown on approved shop drawings.

3.02 INSTALLATION

A. Overall: Install system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
   1. Install system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.

2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

B. Install panels on walls and soffits in accordance with manufacturer's instructions.

C. Protect surfaces in contact with dissimilar metals with bituminous paint. Allow to dry prior to installation.

D. Fasten panels to structural supports; aligned, level, and plumb.

E. Locate joints over supports.

F. Lap panel ends 2 inches, minimum.

G. Provide expansion joints where indicated.

H. Use concealed fasteners unless otherwise indicated by Architect.

I. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.
   1. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

3.03 TOLERANCES

A. Offset From True Alignment Between Adjacent Members Abutting or In Line: 1/16 inch, maximum.

B. Variation from Plane or Location As Indicated on Drawings: 1/4 inch, maximum.

3.04 CLEANING

A. See Section 01 73 00 - Execution for additional requirements.

B. Remove site cuttings from finish surfaces.

C. Remove protective material from wall panel surfaces.

D. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

3.05 PROTECTION

A. Protect metal wall panels until completion of project.

B. Touch-up, repair, or replace damaged wall panels or accessories before Date of Substantial Completion.

3.06 PROTECTION

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 08 42 29
AUTOMATIC ENTRANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sliding type packaged power-operated door assemblies.

1.02 RELATED REQUIREMENTS

A. Section 13 49 13 - Integrated X-Ray Shielding Assemblies.

1.03 DEFINITIONS

A. AAADM: American Association of Automatic Door Manufacturers.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

C. BHMA A156.10 - Power Operated Pedestrian Doors.

D. ITS (DIR) - Directory of Listed Products.

E. NFPA 101 - Life Safety Code.

F. UL (DIR) - Online Certifications Directory.

G. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Shop Drawings:
   1. Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.
   2. Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.

C. Product Data: Include system components, sizes, features, and finishes.

D. Samples: Two samples of exposed to view hardware, and attachment hardware.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.

F. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.

G. Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.

H. 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. Wrenches and other tools required for maintenance of equipment.

1.06 QUALITY ASSURANCE

1.07 MOCK-UPS

A. See Section 01 43 39 - Mockup Requirements for additional requirements.

1.08 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Manufacturer Warranty: Complete forms in Owner's name and register with manufacturer.

1. Provide 5-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
2. Provide 1-year manufacturer warranty for automatic entrance doors against defects in materials and workmanship commencing on Date of Substantial Completion.
3. During warranty period, perform service and repairs with factory-trained technician. Perform safety inspection after each adjustment or repair and submit inspection form.
4. During warranty period, perform warranty work during regular working hours.

C. Finish Warranty: Provide 10-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 manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sliding Automatic Entrance Door Assemblies:
1. Horton Automatics, a division of Overhead Door Corporation; S2001 series: www.hortondoors.com/#sle.
2. **Assa Abloy; Series SL500-NS: www.assaabloy.com**
3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 POWER OPERATED DOORS

A. Power Operated Doors: Provide products that comply with NFPA 101 and requirements of authorities having jurisdiction; provide equipment selected for actual door weight and for light pedestrian traffic, unless otherwise indicated.
1. Sliding and Folding Door Operators: In the event of power failure, provide for manual open, close, and break-away operation of door leaves.
2. Packaged Door Assemblies: Provide components by single manufacturer, factory-assembled, including doors, frames, operators, actuators, and safeties.
   a. Finish exposed equipment components to match door and frame finish.
3. Air Leakage: Maximum of 1 cfm/sf of wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure differential across assembly.
4. Exterior and Vestibule Doors: Provide equipment suitable for operating temperature range of minus 20 to plus 140 degrees F ambient.

B. Sliding and Folding Doors with Full Power Operators: Comply with BHMA A156.10; safeties required; provide break-away operation unless otherwise indicated; in the event of break-away operation, interrupt power operation.
1. Comply with UL 325; acceptable evidence of compliance includes UL (DIR) or ITS (DIR) listing or test report by testing agency acceptable to authorities having jurisdiction.
2. Force Required to Swing Break-Away Panel: 50 pound-force, maximum, measured at 1 inch from the latch edge of the door at any point in the closing cycle.

C. Operators:
1. Electric Operators: 1/8 hp minimum, self-contained, belt driven.

2.03 AUTOMATIC ENTRANCE DOOR ASSEMBLIES

A. Comply with ADA Standards for egress requirements.

B. **Framing Members: Provide manufacturer's standard extruded aluminum framing with stainless steel cladding, reinforced as required to support imposed loads.**
1. Nominal Sizes:
   a. Single Slide and Bi-Parting Sliding Doors: 1-3/4 inch wide by 4-1/2 inch deep.

C. **Door and Sidelight Construction: Heavy duty interlocked extruded aluminum tubular stile and rail sections with stainless steel cladding, through-rod bolted construction with steel corner support at hinge stile of carrier-suspended swinging panels or mechanically fastened corners with welded reinforcing brackets to reduce sag in sliding or breakout mode.**
   1. Door Thickness: 1-3/4 inch, nominal.
   2. Stile Design:
      a. Wide stile, 4 inch, nominal width.
   3. Top Rail Height: 8 inches, nominal.
   4. Bottom Rail Height: 8 inch, nominal.
   5. Glazing Stops: Manufacturer's standard snap-on extruded aluminum square stops with preformed resilient glazing gaskets.
   6. Glazing Stop Width: Manufacturers standard.
   7. Glazing Thickness: 1/4 inch.

D. Sliding Automatic Door: Bi-parting double leaf track-mounted, electric operation, extruded aluminum glazed door, with frame, and operator concealed overhead.
   1. Operation: Power open, power boost operation.
   2. Actuator(s): As indicated on drawings.
   3. Door and Frame Finish: Same as adjacent framing system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.

B. Verify that electric power is available, at the correct location, and is of the correct characteristics.

3.02 INSTALLATION

A. Install equipment in accordance with manufacturer's written instructions, except where more stringent requirements are specified.

B. Install entrances securely anchored in place, plumb, level, and true to location, in alignment with established lines and grades, without warp, bow, or racking of members.

C. Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.

D. Provide for dimensional distortion of components during operation.

E. Install pneumatic lines and door power units in a manner to prevent condensation or freezing.

F. Coordinate installation of components with related and adjacent work; level and plumb.

3.03 ADJUSTING

A. Adjust entrances for correct function and smooth operation, without binding or scraping and without excessive noise; lubricate operating hardware and other moving parts.

3.04 CLOSEOUT ACTIVITIES

A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

END OF SECTION

SECTION 08 45 00
TRANSLUCENT ROOF ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sandwich panel translucent roof system.

1.02 RELATED REQUIREMENTS

A. Section 01 91 19 - Building Enclosure Commissioning.

B. Section 07 54 00 - Thermoplastic Membrane Roofing.

C. Section 07 62 00 - Sheet Metal Flashing and Trim.

D. Section 07 92 00 - Joint Sealants: Sealing joints between perimeter frame and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.

B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

F. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.

G. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

I. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

L. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, panel configuration, internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, weep drainage network, expansion and contraction joint locations and details, and required field welding.

1. Include engineering calculations showing compliance with components/cladding and other loads assembly will be subjected to, stamped by an engineer in the State of Iowa.

D. Samples: Submit two framed panels, 24 by 24 inch in size, illustrating prefinished aluminum surface, specified panel with skins, glazing materials illustrating edge and corner.

E. Test Reports: Substantiating engineering data, test results of previous tests by independent laboratory demonstrating compliance with performance requirements.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle work of this section in accordance with AAMA CW-10.

B. Store panels on long edge above ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

C. Protect prefinished aluminum surfaces with wrapping; do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.
   1. Puncture wrappings at ends for ventilation.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and after installation of sealants.

1.08 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Manufacturer Warranty: Provide 10-year manufacturer warranty against deterioration of exterior polycarbonate glazing panes. Complete forms in Owner's name and register with manufacturer. Include coverage for the following characteristics:
   1. Change in Light Transmission: No greater than 6 percent when tested in accordance with ASTM D1003.
   2. Color Stability of Glazing: Color change no greater 6 CIE Units DELTA E when evaluated according to ASTM D2244.

C. Manufacturer Warranty: Provide 20-year manufacturer warranty against excessive degradation of exterior finish; include provision for replacement of units with excessive cracking, peeling, and adhesion failure of finish. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Translucent Roof Assemblies Manufacturers:
   1. **BASIS OF DESIGN:** Kalwall Corporation; Skyroof System: www.kalwall.com/#sle.
   2. **Kingspan; Gridspan: www.kingspancom**
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESIGN CRITERIA

A. System Design: Design and size assemblies and their components to withstand dead loads and live loads caused by snow, hail, and positive and negative wind loads acting on plane of panel without damage or permanent set.
   1. Regulatory Requirements: Comply with applicable code criteria for loads.
   2. Design Loads: As indicated on drawings.
   3. **Manufacturer’s Thermally Broken System.**

2.03 PERFORMANCE REQUIREMENTS

A. Measure structural performance in accordance with ASTM E330/E330M, using test load of 1.5 times the design wind pressure and 10 second duration of maximum load.

B. Deflection: Limit panel mullion deflection to L/60 with full recovery of glazing materials.

C. System Assembly: Accommodate without damage to system, components or deterioration of seals; movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; deflection of structural support framing, tolerance of supporting components, shortening of building concrete structural columns.
   1. Accommodate a mid-span slab edge deflection of 3/4 inch.

D. Visible Light Transmittance (VT) Loss: 6 percent maximum over 10 years, measured according to ASTM D 1003

E. Thermal Transmittance (U-Factor): Fixed panel and mill finish aluminum framing whole assemblies shall have U-factor of not more than **0.23** Btu/sq. ft. x h x deg F as determined according to NFRC 100.

F. Solar-Heat-Gain Coefficient (SHGC): Panel assembly shall have an SHGC of no greater than 0.35 as determined according to NFRC 200.

G. Air Leakage: Limit air leakage through assembly to 0.06 cu ft/min sq ft of sloped glazed area, measured at pressure differential across assembly of 1.57 psf in accordance with ASTM E283/E283M.

H. Static Pressure Vapor Seal: Provide vapor seal that maintains interior static pressure of at least 1 inch water column (WC) at 72 degrees F and 40 percent relative humidity.

I. Water Leakage: None, when measured in accordance with ASTM E331 at a test pressure difference of 6.24 psf.

J. Expansion/Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components.

K. System Internal Drainage: Drain water entering joints, condensation occurring in framing system, or migrating moisture occurring within system, to the exterior by a weep drainage network.

L. Fabricate to prevent vibration harmonics, thermal movement transmitted to other building elements, and loosening, weakening, or fracturing of attachments or components of system.

M. Combustibility Classification: Class CC1 based on testing according to ASTM D 635.

N. Interior Finish Classification: Class A based on testing according to ASTM E 84.

O. Impact Resistance: No failure at an impact of 500 lbf (677.9 Nm) when tested according to ASTM E 695.

P. Concentrated Loading: No damage while applying a load of 600 lbf (813.5 Nm) over 1 sq. ft. (0.093 sq. m.) when tested according to 29 CFR 1910.23(e)(8); and no damage while applying a load of 400 lbf (542.3 Nm) over 3 inches (152 mm) in diameter according to ASTM E 661.

Q. Hail-Stone Impact Resistance: Panel assemblies that resist penetration by hail stone smaller than 1-3/16 inches (30 mm) in diameter, impacting panel surface at a final velocity up to 44 fps (13.4 m/s) per ASTM E 822.

R. Thermal Aging: When exposed to 300 deg F (149 deg C) for 25 minutes, interior and exterior panels tested according to ASTM D 2244.
   1. Color Retention: 0.75 (Hunter) units ?E maximum fade.
   2. Color Darkening: 0.3 (Hunter) units ?L maximum.
   3. Cracking or Crazing: None when exposed to 300 deg F (149 deg C) for 25 minutes.
   4. Delamination: None when exposed to 300 deg F and 0 deg F (plus 149 and minus 17.8 deg C) for 25 minutes.

2.04 SYSTEMS

A. General: Shop-fabricated, factory-prefinished facade and roof systems consisting of various types of translucent assemblies, internal and external framing components, accessories, related flashings, anchorages, and attachments.

B. Sandwich Panel Translucent Roof Systems: Structurally reinforced translucent panel assemblies, with self-supporting panel framing, insulation, and internal grid of stiffener battens.

2.05 ASSEMBLIES

A. Sandwich Panel Assemblies: Bonded to both sides of structural extruded aluminum grid with manufacturer's standard pattern; exposed surfaces of exterior sheet chemically and permanently treated to protect against surface erosion and extreme weather conditions; polyvinyl fluoride film coated.
   1. Sandwich Panel Insulation: Manufacturer's standard translucent type, with substantive thermal and acoustical properties.
      a. **Type: Manufacturer’s insulation to achieve U-Factor.**
   2. Sandwich Panel Face Sheets: Fiberglass reinforced polymer (FRP).
      a. Type: Flat panel.
      b. Exterior Face Sheet: Translucent, and smooth.
         1) Color: Crystal.
      c. Interior Face Sheet: Translucent, and smooth.
         1) Color: White.
         2) Provide exposed surface of interior face sheets with Flame Spread Index (FSI) of less than 25 and Smoke Developed Index (SDI) of less than 450 in accordance with ASTM E84 and UL 723.

B. Support Framing Members: 2-3/4 inch wide profile; of extruded aluminum, clear anodized finis.

C. Weather Seals: To suit application and in accordance with Section 07 92 00; non-bleeding; non-staining.

D. Sealant Within Translucent Assembly: As required by manufacturer; see Section 07 92 00.

E. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, and compatible with flashing material; see Section 07 92 00.

2.06 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.
   1. See Section 07 62 00 for additional requirements.

C. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch minimum thickness.
   1. See Section 07 62 00 for additional requirements.

D. Fasteners: Stainless steel.
   1. At closures, retaining caps, or battens, use ASTM A 193 (/A 193M), 300 series stainless-steel screws.
   2. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   3. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended in writing by manufacturer.

E. Anchor Bolts: ASTM A 307, Grade A, galvanized steel.

2.07 FABRICATION

A. Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, and ensure proper installation and dynamic movement of perimeter seals.

B. Accurately fit and secure joints and corners. Make joints flush and hairline.

C. Prepare components to receive fabricated anchor devices.

D. Locate fasteners and attachments to ensure concealment from view.

E. Reinforce framing members for external imposed loads.

2.08 FINISHES

A. Aluminum Materials:
   1. Superior Performing Organic Coatings: AAMA 2605; multiple coat, thermally cured polyvinylidene fluoride system.
   2. Color: To be selected by Architect from manufacturer's full range.
   3. Touch-Up Materials: As recommended by coating manufacturer for field application.

B. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify wall openings and adjoining water-resistive barrier materials are ready to receive translucent wall and roof assemblies; see Section 07 27 00 - Air Barriers.

3.02 SURFACE PREPARATION

A. Where aluminum contacts dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

B. Where aluminum contacts concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3.03 INSTALLATION

A. Install translucent panel system with cells vertical in accordance with manufacturer instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings.

G. Coordinate installation of air stop at edge of construction.

H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Install cellular plastic translucent wall systems in accordance with manufacturer instructions.

K. Install perimeter sealant, backing materials, and installation criteria in accordance with Section 07 92 00.

3.04 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

C. Sealant Space Between Panel System Members and Adjacent Construction: Maximum of 1/2 inch and minimum of 1/4 inch.

3.05 FIELD QUALITY CONTROL

A. Provide independent inspection and testing under provisions of Section 01 40 00 - Quality Requirements and 01 91 19 Commissioning of Building Enclosure (BECx).

B. Test installed wall and roof assemblies for water leakage in accordance with AAMA 501.2.

C. Replace components that have failed field testing and retest until performance is satisfactory at no cost.

3.06 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down interior and exterior surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths; remove dirt from corners and wipe surfaces clean.

3.07 PROTECTION

A. Protect finished work from damage until Date of Substantial Completion.

END OF SECTION

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units (ACP-#).

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: coordination with adjacent gypsum board ceilings.

B. Section 09 84 00 - Acoustic Room Components: acoustical wall and ceiling systems.

C. Division 21 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.

D. Division 23 - Air Outlets and Inlets: Air diffusion devices in ceiling.

E. Division 26 - Interior Lighting: Light fixtures in ceiling system.

F. Division 28 - Fire Detection and Alarm: Fire alarm components in ceiling system.

1.03 PRICE AND PAYMENT PROCEDURES

A. Alternates: See Section 01 23 00 - Alternates, for product alternatives affecting this section.

1.04 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, mechanical and electrical items installed in the ceiling, and perimeter conditions.

C. Product Data: Provide data on suspension system components, acoustical units, and trim or accessories.

D. Environmental Product Declarations.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for quantities and additional provisions.
   2. Extra Acoustical Units: all remaining acoustical units.

1.07 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with documented experience.

1.08 MOCK-UPS

A. See Section 01 43 39 - Mockup Requirements for additional requirements.

1.09 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. Provide Basis of Design manufacturer listed in the Interior Finish Schedule, or an approved standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty.

B. 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.

C. Suspension Systems:
   1. Same as for acoustical units.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.

B. Acoustical Panels (ACP-1): Mineral fiber with membrane-faced overlay, with the following characteristics:
   1. Classification: ASTM E1264 Type IV.
   2. Size: 24 by 24 inches.
   3. Thickness: 3/4 inch.
   4. Light Reflectance: 90 percent minimum, determined in accordance with ASTM E1264.
   5. NRC: 0.75 minimum, determined in accordance with ASTM E1264.
   6. Ceiling Attenuation Class (CAC): 35 minimum, determined in accordance with ASTM E1264.
   7. Panel Edge: Square.
   8. Color: White.
   9. Suspension System: Existing to remain.
   10. Products:
      a. **BASIS OF DESIGN:** Armstrong World Industries, Inc; Ultima : www.armstrongceilings.com/#sle.
      b. Certainteed Architectural; Symphony m: www.certainteed.com/ceilings-and-walls/#sle.
      c. USG Corporation; Mars : www.usg.com/ceilings/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Acoustical Tiles (ACP-2): Glass fiber with membrane-faced overlay, with the following characteristics:
   1. Classification: ASTM E1264 Type XII.
      a. Form: 2, cloth.
      b. Pattern: "E" - lightly textured and "G" - Smooth.
   2. Size: 24 by 24 inches.
   3. Thickness: 1 inch.
   4. Light Reflectance: 90 percent minimum, determined in accordance with ASTM E1264.
   5. NRC: 0.90 minimum, determined in accordance with ASTM E1264.

6. Ceiling Attenuation Class (CAC): 20 minimum, determined in accordance with ASTM E1264.
7. Tile Edge: as indicated in Finish Schedule.
8. Suspension System: Semi-concealed.
9. Products:
    a. **BASIS OF DESIGN:** USG Corporation; Halcyon Acoustical Panels : www.usg.com/ceilings/#sle.
    b. **USG Corporation; Mars High NRC 88137 Panels: www.usg.com**
    c. Substitutions: See Section 01 60 00 - Product Requirements.

D. Acoustical Panels (ACP-3): Gypsum, with the following characteristics:
1. Classification: ASTM E1264 Type XX.
2. Size: 24 by 24 inches.
3. Thickness: 1/2 inch.
4. Light Reflectance: 77 percent, determined in accordance with ASTM E1264.
5. Ceiling Attenuation Class (CAC): 35 minimum, determined in accordance with ASTM E1264.
6. Panel Edge: Square.
7. Color: White.
8. Suspension System: Exposed grid.
9. Products:
    a. **BASIS OF DESIGN:** USG Corporation; Sheetrock Lay-In Gypsum Ceiling Panels : www.usg.com/ceilings/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

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.
1. Materials:
    a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.

B. Exposed Suspension System: Hot-dip galvanized steel grid and cap.
1. Application(s): (ACP-2, ACP-4).
2. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
3. Profile: Tee; 9/16 inch face width.
4. Finish: Baked enamel.
5. Color: White.
6. Products:
    a. USG Corporation; Donn Brand Centricitee DXT/DXLT 9/16 inch Acoustical Suspension System: www.usg.com. **(ACP-2)**
    b. **USG Corporation; Donn Brand DX/DXL 15/16 inch Acoustical Suspension System: www.usg.com. (ACP-4)**
    c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Exposed Suspension System: Hot-dip galvanized steel grid with aluminum cap; integrated co-extruded gaskets.
1. Application(s): (ACP-3).
2. Structural Classification: Heavy-duty, when tested in accordance with ASTM C635/C635M.
3. Profile: Tee; 15/16 inch face width.
4. Finish: Baked enamel.
5. Products:
    a. **BASIS OF DESIGN:** USG Corporation; Donn Brand DXLA/DXCE 15/16 inch Acoustical Suspension System: www.usg.com/ceilings/#sle.

b. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application (ACP-3).

D. Perimeter Moldings: Same metal and finish as grid.
1. Size: As required for installation conditions.
2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.

E. Metal Edge Trim for Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
1. Trim Height: 6 inch.
2. Finish: Baked enamel.
3. Color: White.
4. Products:
   a. Armstrong: Axiom Classic; www.armstrong.com
   b. Certainteed; Terminus Straight Perimeter Trim: www.certainteed.com.
   c. USG Corporation; Compasso Suspension Trim: www.usg.com/ceilings/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

F. Acoustical Sealant: as specified in Section 07 92 00.

G. 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.

3.02 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M 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.

3.04 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 sealant at preimeter at walls indicated to have an STC rating.

G. Install hold-down clips on panels within 20 ft of an exterior door and areas indicated on Ceiling Types on drawings.

3.05 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

SECTION 09 84 00
ACOUSTICAL DECORATIVE PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Acoustic baffle array (ACB-#).

B. Mounting accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Dimensional lumber and plywood for quadratic residue diffusers.

B. Section 09 51 00 - Acoustical Ceilings: Ceiling suspension system and panels.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel layout, fabric orientation, and wood grain orientation.

D. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.

E. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

F. Environmental Product Declaration.

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 Panels: Quantity equal to 5 percent of total installed, but not less than one of each type.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with documented experience.

B. Single-Source Responsibility: Provide acoustical panel units and installation components for each type by a single manufacturer.

C. Coordination of Work: Coordinate acoustical wall work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Before installing acoustical wall panels, permit them to reach room temperature and a stabilized moisture content.

D. Protect edges from damage.

1.07 MOCK-UPS

A. See Section 01 43 39 - Mockup Requirements for additional requirements.

1.08 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 70 percent prior to, during, and after installation.

1.09 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. Provide twenty year manufacturer warranty for product and colorfastness.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide Basis of Design manufacturer listed in the Finish Schedule, or an approved standard or custom product from one of the other listed manufacturers, approved prior to bid, with equivalent performance, material properties, features, general configuration, appearance, and warranty.

B. Felt Sound-Absorbing Units:
   1. **BASIS OF DESIGN:** Acoufelt; Versiform Dimensional Baffles: www.acoufelt.com.
      a. ACB-1: Versiform Baffles.
      b. ACB-2, ACB-3: Linear Baffles.
   2. CSI Creative: www.csicreative.com.
   3. Turf: www.turf.design
   4. **MPS Acoustics: ww.mpsacoustics.com**
      a. **Custom Wave Baffles (ACB-1)**
      b. **Joist Felt Ceiling Baffles (ACB-2)**
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FELT SOUND-ABSORBING UNITS:

A. General: Prefinished, factory assembled fabric-covered panels.
   1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Felt Acoustic Ceiling Baffles: Prefinished, factory assembled felt panels.
   1. Material: 100% Polyester felt, 60% pre-consumer recycled.
   2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   3. Noise Reduction Coefficient (NRC): 1.65, when tested in accordance with ASTM C423 for suspended ceiling mounting, per ASTM E795.
   4. Cleanable and easily demountable.
   5. Colorfastness: ISO 105-B02, Grade 6-7.
   6. Panel Shapes/Sizes: Varied sizes required, as indicated in Reflected Ceiling Plan.
   7. Thickness: 1/2 inch/12 mm.
   8. Edges: Exposed felt, machined edge.
   9. Corners: Square, exposed felt, machined edge.
   10. Color: as indicated in Finish Schedule.
   11. Mounting Method: as indicated in Finish Schedule.
      a. Suspended with integrated threaded rod to unistrut.
      b. Threaded Cable to T-grid.
   12. Indoor Air Quality: SCS Global Indoor Advantage Gold, VOC less than/equal to 0.5mg/3
   13. Environmental Certifications: LBC Red List Free

2.03 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

C. Factory-applied finishes on acoustical panels to be uniform, smooth, and without blemishes.

2.04 ACCESSORIES

A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
   1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.
   2. Z-clip hanger and magnet system with magnets recessed into panel frame and designed to engage steel mounting plates secured to substrate with screws.

B. Panel Adhesive: Low VOC; acceptable to acoustical panel manufacturer for application as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Field verify surface sizes before fabricating panels.

3.02 INSTALLATION

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. Install mounting accessories and supports in accordance with shop drawings.

C. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

D. Suspend ceiling baffles at locations and heights as indicated.

E. Install acoustical units to construction tolerances of plus or minus 1/8 inch for the following:
   1. Plumb and level.
   2. Flatness.
   3. Width of joints.

3.03 CLEANING

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bumper rails.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking for wall protection items.

B. Section 09 21 16 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.

B. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies.

E. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for submittal procedures.

B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.

C. Shop Drawings: Include plans, elevation, sections, and attachment details.

D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
   1. Submit two sections of bumper rails, 8 inches long.

E. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

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. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.

D. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide Basis of Design listed in the Finish Schedule in the Drawings, or a standard or custom product from one of the other listed manufacturer, approved prior to bid, with equivalent performance, material properties, features, general configuration, appearance, and warranty.

B. Bumper Rails:
   1. Babcock-Davis: www.babcockdavis.com

2. Construction Specialties, Inc: www.c-sgroup.com/#sle.
3. **BASIS OF DESIGN:** Inpro: www.inprocorp.com/#sle.
4. Nystrom, Inc: www.nystrom.com.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE CRITERIA

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.

B. 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.

C. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.

D. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.03 PRODUCT TYPES

A. Bumper Rails: Factory- or shop-fabricated, with preformed end caps and internal and external corners:
   1. Performance of Installed Assembly:
      a. Resist lateral force of 250 lbs at any point without damage or permanent set.
   2. Material: High impact vinyl, PET or PETG, color as indicated in Interior Finish Schedule.
   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. Mounting: Surface, vinyl cover on 0.060" aluminum retainer.
   5. Height: 4-inches
   6. Projection From Wall to Outside of Rail: 3/8 inch.
   7. Provide finished ends.

B. See Section 06 10 00 for wood blocking for wall protection components.

C. See Section 09 21 16 for supports in stud wall construction.

2.04 FABRICATION

A. Fabricate components with tight 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. 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.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/4 inch.

B. Maximum Variation From Level or Plane For Visible Length: 1/4 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. Commercial toilet accessories, including but not limited to:
   1. Framed Mirrors
   2. Grab Bars
   3. Coat Hooks
   4. Sanitary Napkin Disposals

B. Commercial shower and bath accessories, including but not limited to:
   1. Shower Rods and Hooks
   2. Shower Curtains
   3. Shower Seats

C. Electric hand/hair dryers, installed under Division 26 - Electrical

D. Utility room accessories, including:
   1. Mop and Broom Holders

E. Installation of owner-furnished items, including but not limited to:
   1. Toilet Paper Dispenser
   2. Paper Towel Dispenser
   3. Soap Dispenser
   4. 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 08 83 00 - Mirrors: Frameless mirrors.

D. Section 09 21 16 - Gypsum Board Assemblies; substrate

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

F. ASTM C1036 - Standard Specification for Flat Glass.

G. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use.

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 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

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 Shower Curtains: one extra curtain per shower stall.
   3. Extra Shower Curtain Hooks: ten extra shower curtain hooks.
   4. Extra Coat Hooks: all remaining coat hooks.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. AJW Architectural Products: www.ajw.com.
   2. ASI - American Specialties, Inc: www.americanspecialties.com.
   3. Bradley Corporation: www.bradleycorp.com.
   4. Bobrick Washroom Equipment, Inc.; www.bobrick.com
   5. Georgia-Pacific Professional: www.blue-connect.com.
   6. Hafele; www.hafele.com
   7. Peter Pepper.
   8. 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. Keys: Provide four keys for each accessory to Owner; master key lockable accessories.

C. Stainless Steel Sheet: ASTM A666/A666M, Type 304.

D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

E. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

H. 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. Toilet Paper Dispenser: Double roll, recessed, stainless steel unit with pivot hinge, tumbler lock.
   1. Products:

a. Bobrick B-4388.
b. Substitutions: Section 01 60 00 - Product Requirements.

B. Paper Towel Dispenser: Scott 09992.
1. Owner-furnished, Contractor-installed.

C. Soap Dispenser:
1. Owner-furnished, Contractor-installed

D. Touchless Hand Sanitizer Dispenser:
1. Owner-furnished, Contractor-installed.

E. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass; ASTM C1048.
1. Size: As indicated on drawings.
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. American Specialties Inc: 0600-A
b. Bobrick B-290.
c. Substitutions: Section 01 60 00 - Product Requirements.

F. Toilet Seat Cover Dispenser:
1. Owner-furnished, Contractor-installed.
2. Product:
a. Gamco TSC-1.

G. Grab Bars: Stainless steel, smooth 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.

H. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
1. Owner-furnished, Contractor-installed.
2. Products:
a. Bobrick: B-270 .
b. 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:
1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
2. Size: 60 by 72 inches, hemmed edges.
3. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
4. Color: White.
5. Shower Curtain Hooks: Stainless steel spring wire designed for snap closure.

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.

2.06 ELECTRIC HAND/HAIR DRYERS

A. Electric Hand Dryers: Traditional fan-in-case type, with downward fixed nozzle.
   1. Operation: Automatic, sensor-operated on and off.
   2. Mounting: Wall-mounted - surface.
   3. Cover: Plastic.
      a. Tamper-resistant screw attachment of cover to mounting plate.
      b. Screened or shielded air intake.
      c. Screen or shield to prevent access to motor/heater.
   4. Runtime: 12 seconds.
   5. Electric Hand Dryer Products:
      a. **BASIS OF DESIGN:** Dyson; Airblade V: www.dyson.com.
      b. **Saniflow; Speedflow Plus M17ACS-UL: www.saniflowcorp.com**
      c. Substitutions: Section 01 60 00 - Product Requirements.

2.07 DIAPER CHANGING STATIONS

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
   1. Style: Vertical.
   2. Material: Polyethylene.
   3. Mounting: Surface.
   4. Features: Pneumatic cylinder, concealed hinge, ADA cam-buckle on safety strap, liner dispenser, hands-free door opener, 5-year warranty.
   5. Color: Gray.
   6. Minimum Rated Load: 200 pounds.
   7. Products:
      a. Koala Kare Products: KB301-01; www.koalabear.com.
      b. Substitutions: 01 60 00 - Product Requirements.

2.08 UTILITY ROOM ACCESSORIES

A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
   1. Drying rod: Stainless steel, 1/4 inch diameter.
   2. Hooks: 2, 0.06 inch stainless steel rag hooks at shelf front.
   3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
   4. Length: Manufacturer's standard length for number of holders/hooks.

2.09 MISCELLANEOUS ACCESSORIES

A. Coat Hook: Heavy duty stainless steel; single-prong, concealed mounting, satin finish.
   1. Product:
      a. Bobrick B76717.
      b. Substitutions: Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

D. Verify that field measurements are as indicated on drawings.

E. Verify installation of blocking, reinforcing plates, and concealed anchors in walls, and ceilings.

F. See Section 06 1000 - 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. Grab Bars:
      a. Mount top of grab bar 34 inches above finish floor, and as indicated on drawings.
      b. Where toilet paper dispenser mounting conflicts with a grab bar, mount above grab bar with bottom of dispenser 12 inches clear above grab bar, but no higher than 48 inches above finish floor.
   2. Other Accessories: As indicated on drawings.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 51 13
METAL LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lockers (L-1, L-2.

B. Locker benches.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base construction.

B. Section 12 36 00 - Countertops: Solid surface top for benches

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. 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.

D. ICC A117.1 - Accessible and Usable Buildings and Facilities.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures 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 4 by 4 inches in size showing color and finish of metal locker material.

E. Manufacturer's Installation Instructions: Indicate component installation assembly.

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. **BASIS OF DESIGN:** ASI Storage Solutions: www.asi-storage.com/#sle.
2. Hadrian: www.hadrian-inc.com/#sle.
3. List Industries, Inc: www.listindustries.com/#sle.
4. Lyon Workspace Products: www.lyonworkspace.com/#sle.
5. Penco Products, Inc: www.pencoproducts.com/#sle.
6. Republic Storage Systems Co: www.republicstorage.com/#sle.
7. **BASIS OF DESIGN:** Tennsco Storage; Steel Lockers: www.tennsco.com/#sle.
8. **Lockers MFG: www.lockersmfg.com**
9. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 LOCKER APPLICATIONS

A. Staff Lockers: Metal lockers, wall mounted for base indicated on drawings.
1. Width: 15 inches.
2. Depth: 18 inches.
3. Height: 60 inches.
4. Configuration: Single tier (L-1) and Double tier (L-2).
5. Fittings: Size and configuration as indicated on drawings.

a. Hat shelf.
b. Hooks: One single prong.

6. Ventilation: Louvers at top and bottom of door panel.
7. Locking: Padlock hasps, for padlocks provided by Owner.
8. Color: As indicated in Finish Schedule.

2.03 METAL LOCKERS

A. Accessibility: Design units indicated on drawings as 'accessible' to comply with ICC A117.1 and ADA Standards.

B. Locker Case Construction:
1. Heavy-Duty, Welded Construction: Made of formed and welded together sheet steel; metal edges finished smooth without burrs; baked enamel or powder coat finished inside and out.
a. Assembly: Do not use bolts, screws, or rivets to assemble locker bodies.
b. Locker Body Components: Formed and flanged from steel sheet of the following type and minimum thicknesses:
1) Unperforated Steel Sheet: Commercial Steel (CS), Type B, supplied for exposed applications and complying with ASTM A1008/A1008M and the following:
(a) Zinc-Coated by the Hot-Dip Process: Comply with ASTM A653/A653M, coating designation G60/Z180.
2) Body and Shelves: 16 gauge, 0.0598 inch.
3) Backs: 18 gauge, 0.0478 inch.
4) Base: 18 gauge, 0.0478 inch.
(a) Height: 4 inches.
c. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
1) Door Frame: 16 gauge, 0.0598 inch, minimum.
d. Where ends or sides are exposed, provide flush panel closures.
e. Provide filler strips where indicated or required, securely attached to lockers.

C. Doors: Channel edge; welded construction, manufacturer's standard stiffeners, grind and finish edges smooth.
1. Door Thickness: 16 gauge, 0.0598 inch, minimum.
2. Form recess for operating handle and locking device.

D. Latches and Door Handles: Manufacturer's standard.
1. Latching: Manufacturer's standard for locking arrangement selected.
a. Three-Point Lift Handle Gravity Latch: Pocket-mounted, provide for doors 18 inches or taller.
1) Handle: Steel finger lift mechanism with exposed portion encased in molded plastic trigger.
(a) Padlock Eye: Integral with lift trigger, sized for use with 9/32 inch diameter padlock shackles.

E. Cup, Pocket: Manufacturer's standard, with integral pull, and recessed surface punched for installation of lock, latch lift mechanism, and number plate.

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 oval shaped aluminum plates. Form numbers 3/4 inch high of block font style with ADA designation, in contrasting color.

I. Locks: Locker manufacturer's standard type indicated in Applications article above.

J. Built-In Lock Boxes: Same material as locker, manufacturer's standard size, with padlock hasps, for padlocks provided by Owner.

2.04 LOCKER BENCHES

A. Locker Benches: Free standing type; bench top of solid surface; satin stainless steel pedestals.
   1. Load Capacity per Bracket: 250 pounds.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
      a. Benches shall have seats that are 42 inches (1065 mm) long minimum and 20 inches (510 mm) deep minimum and 24 inches (610 mm) deep maximum.
      b. Back support shall be 42 inches (1065 mm) long minimum and shall extend from a point 2 inches (51 mm) maximum above the seat surface to a point 18 inches (455 mm) minimum above the seat surface. Back support shall be 2 1/2 inches (64 mm) maximum from the rear edge of the seat measured horizontally.
   3. Size: As follows, unless otherwise indicated on Drawings.
      a. Height: 17-19 inches.
      b. Length: 42 inches.
   4. Mounting: Floor mount pedestals.

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 and filler panels.

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 21 13 13
WET-PIPE SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Pipes, fittings, and specialties.
   2. Fire-protection valves.
   3. Sprinklers.
   4. Alarm devices.
   5. Pressure gages.

1.03 DEFINITIONS

A. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175 psig maximum.

1.04 SYSTEM DESCRIPTIONS

A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

B. Extend existing sprinkler system to new additions and renovated areas.

1.05 PERFORMANCE REQUIREMENTS

A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.

B. Sprinkler system design shall be approved by authorities having jurisdiction.
   1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
   2. Sprinkler Occupancy Hazard Classifications:
      a. Building Service Areas: Ordinary Hazard, Group 1.
      b. Electrical Equipment Rooms: Ordinary Hazard, Group 1.
      c. General Storage Areas: Ordinary Hazard, Group 1.
      d. Laundries: Ordinary Hazard, Group 1.
      e. Mechanical Equipment Rooms: Ordinary Hazard, Group 1.
      f. Office and Public Areas: Light Hazard.
      g. Minimum Density for Automatic-Sprinkler Piping Design:
         1) Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
         2) Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
         3) Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. area.
      h. Maximum Protection Area per Sprinkler: Per UL listing.
         1) Office Spaces: 120 sq. ft..
         2) Storage Areas: 130 sq. ft..
         3) Mechanical Equipment Rooms: 130 sq. ft..
         4) Electrical Equipment Rooms: 130 sq. ft..
         5) Other Areas: According to NFPA 13 recommendations unless otherwise indicated.
      i. Total Combined Hose-Stream Demand Requirement: According to NFPA 13 unless otherwise indicated:
         1) Light-Hazard Occupancies: 100 gpm for 30 minutes.
         2) Ordinary-Hazard Occupancies: 250 gpm for 60 to 90 minutes.

1.06 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For wet-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.

C. Qualification Data: For qualified Installer.

D. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

E. Fire-hydrant flow test report.

F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

G. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

1.07 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.

B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
   1. NFPA 13, "Installation of Sprinkler Systems."

1.08 PROJECT CONDITIONS

A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:
   1. Notify Owner no fewer than 7 days in advance of proposed interruption of sprinkler service.
   2. Do not proceed with interruption of sprinkler service without Owner's written permission.

1.09 COORDINATION

A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

1.10 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

PART 2 PRODUCTS

2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

2.02 STEEL PIPE AND FITTINGS

A. Standard Weight, Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.

B. Schedule 10, Black-Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, Schedule 10 in NPS 5 and smaller; and NFPA 13-specified wall thickness in NPS 6 to NPS 10, plain end.

C. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.

D. Uncoated, Steel Couplings: ASTM A 865, threaded.

E. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

F. Malleable- or Ductile-Iron Unions: UL 860.

G. Cast-Iron Flanges: ASME 16.1, Class 125.

H. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.

I. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.

J. Grooved-Joint, Steel-Pipe Appurtenances:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Anvil International, Inc.
      b. Corcoran Piping System Co.
      c. National Fittings, Inc.
      d. Shurjoint Piping Products.
      e. Tyco Fire & Building Products LP.
      f. Victaulic Company.
   2. Pressure Rating: 175 psig minimum.
   3. Galvanized and Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
   4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

K. Steel Pressure-Seal Fittings: UL 213, FM-approved, 175-psig pressure rating with steel housing, rubber O-rings, and pipe stop; for use with fitting manufacturers' pressure-seal tools.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Victaulic Company.

2.03 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free.
   1. Class 125, Cast-Iron Flanges and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
   2. Class 250, Cast-Iron Flanges and Class 300, Steel Raised-Face Flanges: Ring-type gaskets.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.04 LISTED FIRE-PROTECTION VALVES

A. General Requirements:
   1. Valves shall be UL listed or FM approved.
   2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig.

B. Ball Valves:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anvil International, Inc.
      b. Victaulic Company.
   2. Standard: UL 1091 except with ball instead of disc.
   3. Valves NPS 1-1/2 and Smaller: Bronze body with threaded ends.
   4. Valves NPS 2 and NPS 2-1/2: Bronze body with threaded ends or ductile-iron body with grooved ends.
   5. Valves NPS 3: Ductile-iron body with grooved ends.

C. Iron Butterfly Valves:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anvil International, Inc.
      b. Fivalco Inc.
      c. Global Safety Products, Inc.
      d. Kennedy Valve; a division of McWane, Inc.
      e. Milwaukee Valve Company.
      f. NIBCO INC.
      g. Pratt, Henry Company.
      h. Shurjoint Piping Products.
      i. Tyco Fire & Building Products LP.
      j. Victaulic Company.
   2. Standard: UL 1091.
   3. Pressure Rating: 175 psig.
   4. Body Material: Cast or ductile iron.
   5. End Connections: Grooved.

D. Check Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. AFAC Inc.
      b. American Cast Iron Pipe Company; Waterous Company Subsidiary.
      c. Anvil International, Inc.
      d. Clow Valve Company; a division of McWane, Inc.
      e. Crane Co.; Crane Valve Group; Crane Valves.
      f. Crane Co.; Crane Valve Group; Jenkins Valves.
      g. Crane Co.; Crane Valve Group; Stockham Division.
      h. Fire-End & Croker Corporation.
      i. Fire Protection Products, Inc.
      j. Fivalco Inc.
      k. Globe Fire Sprinkler Corporation.
      l. Groeniger & Company.
      m. Kennedy Valve; a division of McWane, Inc.
      n. Matco-Norca.
      o. Metraflex, Inc.
      p. Milwaukee Valve Company.
      q. Mueller Co.; Water Products Division.
      r. NIBCO INC.
      s. Potter Roemer.
      t. Reliable Automatic Sprinkler Co., Inc.

u. Shurjoint Piping Products.
v. Tyco Fire & Building Products LP.
w. United Brass Works, Inc.
x. Venus Fire Protection Ltd.
y. Victaulic Company.
z. Viking Corporation.
aa. Watts Water Technologies, Inc.

2. Standard: UL 312.
3. Pressure Rating: 250 psig minimum.
4. Type: Swing check.
5. Body Material: Cast iron.
6. End Connections: Flanged or grooved.

E. Iron OS&Y Gate Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Cast Iron Pipe Company; Waterous Company Subsidiary.
b. American Valve, Inc.
c. Clow Valve Company; a division of McWane, Inc.
d. Crane Co.; Crane Valve Group; Crane Valves.
e. Crane Co.; Crane Valve Group; Jenkins Valves.
f. Crane Co.; Crane Valve Group; Stockham Division.
g. Hammond Valve.
h. Milwaukee Valve Company.
i. Mueller Co.; Water Products Division.
j. NIBCO INC.
k. Shurjoint Piping Products.
l. Tyco Fire & Building Products LP.
m. United Brass Works, Inc.
n. Watts Water Technologies, Inc.
2. Standard: UL 262.
3. Pressure Rating: 250 psig minimum.
4. Body Material: Cast or ductile iron.
5. End Connections: Flanged or grooved.

2.05 TRIM AND DRAIN VALVES

A. General Requirements:
1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig minimum.

B. Angle Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Fire Protection Products, Inc.
b. United Brass Works, Inc.

C. Ball Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Affiliated Distributors.
b. Anvil International, Inc.
c. Barnett.
d. Conbraco Industries, Inc.; Apollo Valves.
e. Fire-End & Croker Corporation.

f. Fire Protection Products, Inc.
g. Flowserve.
h. FNW.
i. Jomar International, Ltd.
j. Kennedy Valve; a division of McWane, Inc.
k. Kitz Corporation.
l. Legend Valve.
m. Metso Automation USA Inc.
n. Milwaukee Valve Company.
o. NIBCO INC.
p. Potter Roemer.
q. Red-White Valve Corporation.
r. Southern Manufacturing Group.
s. Stewart, M. A. and Sons Ltd.
t. Tyco Fire & Building Products LP.
u. Victaulic Company.
v. Watts Water Technologies, Inc.

D. Globe Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Fire Protection Products, Inc.
b. United Brass Works, Inc.

E. Plug Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Southern Manufacturing Group.

2.06 SPECIALTY VALVES

A. General Requirements:
1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating:
a. Standard-Pressure Piping Specialty Valves: 175 psig minimum.
3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

B. Automatic (Ball Drip) Drain Valves:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFAC Inc.
b. Reliable Automatic Sprinkler Co., Inc.
c. Tyco Fire & Building Products LP.
2. Standard: UL 1726.
3. Pressure Rating: 175 psig minimum.
4. Type: Automatic draining, ball check.
5. Size: NPS 3/4.
6. End Connections: Threaded.

2.07 SPRINKLER SPECIALTY PIPE FITTINGS

A. Branch Outlet Fittings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Anvil International, Inc.

b. National Fittings, Inc.
c. Shurjoint Piping Products.
d. Tyco Fire & Building Products LP.
e. Victaulic Company.

2. Standard: UL 213.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
5. Type: Mechanical-T and -cross fittings.
6. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
7. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
8. Branch Outlets: Grooved, plain-end pipe, or threaded.

B. Flow Detection and Test Assemblies:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AGF Manufacturing Inc.
b. Reliable Automatic Sprinkler Co., Inc.
c. Tyco Fire & Building Products LP.
d. Victaulic Company.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

C. Branch Line Testers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Elkhart Brass Mfg. Company, Inc.
b. Fire-End & Croker Corporation.
c. Potter Roemer.
2. Standard: UL 199.
3. Pressure Rating: 175 psig.
4. Body Material: Brass.
5. Size: Same as connected piping.
6. Inlet: Threaded.
7. Drain Outlet: Threaded and capped.
8. Branch Outlet: Threaded, for sprinkler.

D. Sprinkler Inspector's Test Fittings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AGF Manufacturing Inc.
b. Triple R Specialty.
c. Tyco Fire & Building Products LP.
d. Victaulic Company.
e. Viking Corporation.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with sight glass.
5. Size: Same as connected piping.

6. Inlet and Outlet: Threaded.

E. **Flexible, Sprinkler Hose Fittings:**
   1. **Manufacturers: Subject to compliance with requirements, provide products by one of the following:**
      a. **Victaulic**
      b. **Fivalco Inc.**
      c. **FlexHead Industries, Inc.**
      d. **Gateway Tubing Inc.**
   2. **Standard: UL 1474.**
   3. **Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.**
   4. **Pressure Rating: 175 psig minimum.**
   5. **Size: Same as connected piping, for sprinkler.**
   6. **Verify use is acceptable by AHJ prior to using.**

2.08 SPRINKLERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AFAC Inc.
   2. Globe Fire Sprinkler Corporation.
   3. Reliable Automatic Sprinkler Co., Inc.
   4. Tyco Fire & Building Products LP.
   5. Venus Fire Protection Ltd.
   6. Victaulic Company.
   7. Viking Corporation.

B. General Requirements:
   1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
   2. Pressure Rating for Automatic Sprinklers: 175 psig minimum.

C. Automatic Sprinklers with Heat-Responsive Element:
   1. Early-Suppression, Fast-Response Applications: UL 1767.
   2. Nonresidential Applications: UL 199.
   3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.

D. Sprinkler Finishes:
   1. Chrome plated.
   2. Bronze.
   3. Painted.

E. Special Coatings:
   1. Wax.
   2. Lead.
   3. Corrosion-resistant paint.

F. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
   1. Sidewall Mounting: Chrome-plated steel, one piece, flat.

G. Sprinkler Guards:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Reliable Automatic Sprinkler Co., Inc.

b. Tyco Fire & Building Products LP.
c. Victaulic Company.
d. Viking Corporation.

2. Standard: UL 199.
3. Type: Wire cage with fastening device for attaching to sprinkler.

2.09 ALARM DEVICES

A. Alarm-device types shall match piping and equipment connections.

B. Water-Flow Indicators:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ADT Security Services, Inc.
b. McDonnell & Miller; ITT Industries.
c. Potter Electric Signal Company.
d. System Sensor; a Honeywell company.
e. Viking Corporation.
f. Watts Industries (Canada) Inc.
2. Standard: UL 346.
3. Water-Flow Detector: Electrically supervised.
4. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
5. Type: Paddle operated.
6. Pressure Rating: 250 psig.
7. Design Installation: Horizontal or vertical.

C. Pressure Switches:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFAC Inc.
b. Barksdale, Inc.
c. Detroit Switch, Inc.
d. Potter Electric Signal Company.
e. System Sensor; a Honeywell company.
f. Tyco Fire & Building Products LP.
g. United Electric Controls Co.
h. Viking Corporation.
2. Standard: UL 346.
3. Type: Electrically supervised water-flow switch with retard feature.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design Operation: Rising pressure signals water flow.

D. Valve Supervisory Switches:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Fire-Lite Alarms, Inc.; a Honeywell company.
b. Kennedy Valve; a division of McWane, Inc.
c. Potter Electric Signal Company.
d. System Sensor; a Honeywell company.
2. Standard: UL 346.
3. Type: Electrically supervised.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design: Signals that controlled valve is in other than fully open position.

2.10 PRESSURE GAGES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AMETEK; U.S. Gauge Division.
   2. Ashcroft, Inc.
   3. Brecco Corporation.
   4. WIKA Instrument Corporation.

B. Standard: UL 393.

C. Dial Size: 3-1/2- to 4-1/2-inch diameter.

D. Pressure Gage Range: 0 to 250 psig minimum.

E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.

F. Air System Piping Gage: Include "AIR" or "AIR/WATER" label on dial face.

PART 3 EXECUTION

3.01 PREPARATION

A. If required to finalize hydraulic calculations, perform fire-hydrant flow test according to NFPA 13 and NFPA 291.

B. Report test results promptly and in writing.

3.02 PIPING INSTALLATION

A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
   1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.

B. Piping Standard: Comply with requirements for installation of sprinkler piping in NFPA 13.

C. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

D. Install unions adjacent to each valve in pipes NPS 2 and smaller.

E. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

F. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.

G. Install sprinkler piping with drains for complete system drainage.

H. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.

I. Install alarm devices in piping systems.

J. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.

K. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

L. Fill sprinkler system piping with water.

M. Install sleeve seals for piping penetrations of concrete walls and slabs.

N. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.03 JOINT CONSTRUCTION

A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.

B. Install unions adjacent to each valve in pipes NPS 2 and smaller.

C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.

G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.

I. Steel-Piping, Pressure-Sealed Joints: Join lightwall steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.

J. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
   1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.

K. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.

L. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.

M. Steel-Piping, Pressure-Sealed Joints: Join Schedule 5 steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.

N. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.04 VALVE AND SPECIALTIES INSTALLATION

A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.

B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.

C. Specialty Valves:
   1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
   2. Alarm Valves: Include bypass check valve and retarding chamber drain-line connection.

3.05 SPRINKLER INSTALLATION

A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.

B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.

C. Install sprinklers into flexible, sprinkler hose fittings and install hose into bracket on ceiling grid.

3.06 IDENTIFICATION

A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.

B. Identify system components, wiring, cabling, and terminals.

3.07 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
4. Coordinate with fire-alarm tests. Operate as required.
5. Verify that equipment hose threads are same as local fire-department equipment.

C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.

3.08 CLEANING

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers with paint other than factory finish.

3.09 PIPING SCHEDULE

A. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.

B. Standard-pressure, wet-pipe sprinkler system, NPS 2 and smaller, shall be one of the following:
1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
2. Standard-weight, black-steel pipe with plain ends; uncoated, plain-end-pipe fittings; and twist-locked joints.
3. Standard-weight, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
4. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.

C. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 to NPS 6, shall be one of the following:
1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
2. Standard-weight, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
3. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
4. Schedule 10, or hybrid black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
5. Schedule 10, or hybrid black-steel pipe with plain ends; welding fittings; and welded joints

3.10 SPRINKLER SCHEDULE

A. Use sprinkler types in subparagraphs below for the following applications:
1. Rooms without Ceilings: Upright sprinklers.
2. Rooms with Suspended Ceilings: Concealed sprinklers.
3. Wall Mounting: Sidewall sprinklers.

4. Spaces Subject to Freezing: Upright, pendent, dry sprinklers; and sidewall, dry sprinklers as indicated.

B. Provide sprinkler types in subparagraphs below with finishes indicated.
   1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
   2. Flush Sprinklers: Bright chrome, with painted white escutcheon.
   3. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
   4. Upright Pendent and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view; wax coated where exposed to acids, chemicals, or other corrosive fumes.

END OF SECTION 21 13 13

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SECTION 23 21 13.13
UNDERGROUND HYDRONIC PIPING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Fiberglass pipe and fittings.

1.03 QUALITY ASSURANCE

A. Fiberglass Pipe and Fitting Installers: Installers of RTRF and RTRP shall be certified by manufacturer of pipes and fittings as having been trained and qualified to join fiberglass piping with manufacturer-recommended adhesive.

B. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing hydronic piping systems with the following minimum working-pressure ratings:
   1. Condenser-Water Piping: 100 psig at 150F.

2.02 FIBERGLASS PIPE AND FITTINGS

A. RTRP: ASTM D2996, filament-wound pipe with tapered bell and spigot ends for adhesive joints.

B. RTRF: Compression or spray up/contact molded of same material, pressure class, and joining method as pipe.

C. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.
   1. Use fiberglass adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Flanges: ASTM D 4024. Full-face gaskets suitable for the service, minimum 1/8-inch- (3.2-mm-) thick, 60-70 durometer. ASTM A307, Grade B, hex-head bolts with washers.

2.03 TRANSITION FITTINGS

A. Plastic-to-Metal Transition Fittings: CPVC one-piece fitting with one threaded brass or copper insert and one Schedule 80 solvent-cemented-joint end.

PART 3 EXECUTION

3.01 EARTHWORK

A. See Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

3.02 PIPING APPLICATION

A. **Condenser-Water Piping: Refer to the HVAC Piping and Insulation Schedule on the drawings.**

3.03 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Remove standing water in the bottom of trench.

C. Do not backfill piping trench until field quality-control testing has been completed and results approved.

D. Install piping at uniform grade of 0.2 percent. Install drains, consisting of a tee fitting, NPS 3/4 (DN 20) ball valve, and short NPS 3/4 (DN 20) threaded nipple with cap, at low points and elsewhere as required for system drainage. Install manual air vents at high points.

E. Install components with pressure rating equal to or greater than system operating pressure.

F. Install piping free of sags and bends.

G. Install fittings for changes in direction and branch connections.

H. See Section 230517 "Sleeves and Sleeve Seals for HVAC Piping" for sleeves and mechanical sleeve seals through exterior building walls.

I. Secure anchors with concrete thrust blocks. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

J. See Section 134700 "Cathodic Protection" for cathodic devices and connections to piping and conduit systems.

3.04 JOINT CONSTRUCTION

A. See Section 330500 "Common Work Results for Utilities" for basic piping joint construction.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.05 IDENTIFICATION

A. Install continuous plastic underground warning tapes during back filling of trenches for underground hydronic piping. Locate tapes 6 to 8 inches (150 to 200 mm) below finished grade, directly over piping. See Section 312000 "Earth Moving" for warning-tape materials and devices and their installation.

3.06 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:
   1. Prepare hydronic piping for testing according to ASME B31.9 and as follows:
      a. Leave joints, including welds, uninsulated and exposed for examination during test.
      b. Fill system with water. Where there is risk of freezing, air or a safe, compatible liquid may be used.
      c. Use vents installed at high points to release trapped air while filling system.
   2. Test hydronic piping as follows:
      a. Subject hydronic piping to hydrostatic test pressure that is not less than 1.5 times the design pressure.
      b. After hydrostatic test pressure has been applied for 10 minutes, examine joints for leakage. Remake leaking joints using new materials and repeat hydrostatic test until no leaks exist.

D. Prepare test and inspection reports.

END OF SECTION

SECTION 27 00 00
GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Division 27 Specifications are provided to define the standards and criteria to be used to bid, plan, furnish, install, test, and document communication systems for IMEO Addition and Renovation. These specifications shall form the basis for implementation of the procurement, installation, inspection, and close-out process.

B. Division 27 has been designed and developed based on NFPA 70 (NEC), National Electrical Safety Code (NESC), Institute of Electronic and Electrical Engineers (IEEE), and a combination of ANSI/TIA Telecommunication Standards, and BICSI methodologies. The requirements within those documents are not superseded herein unless specifically stated. NEC and NESC code requirements are unable to be superseded by this document at any time. ANSI/TIA standards and BICSI methodologies are guidelines and recommendations for best practices and may be superseded, as specified, or may be made more stringent by this document.

C. Any use of the word “shall” marks a mandatory requirement. Use of the word “may” or “should” suggests optional elements. All conflicts within this document shall be resolved by the Construction Manager in consultation with the Design Team. The standards of DAS shall take precedence in the resolution of any dispute.

D. Unauthorized changes and/or deviations from these specifications, regardless of scale, may result in re-design, reconstruction, or re-installation of communications elements at the contractor’s expense. Contractors shall obtain formal written approval prior to bidding and prior to installation in order to deviate from these specifications or from ANSI/TIA standards and BICSI methodologies. Contractors shall not deviate from NEC and NESC requirements.

E. Division 27 Specifications address information transport pathways, multiple different types of communication systems, spaces, media, grounding, identification, testing, and documentation requirements in support of multiple information transport infrastructures.

F. Specific responsibilities of Division 27 include, but are not limited to:
   1. Installation of the intra-building pathways, cabling, and coordinating space requirements necessary to house the communication systems and associated electronic information transport equipment. Pathways and spaces shall be provided to support the known systems and cabling requirements, as well as provisions for those that may be required in the future for growth purposes.
   2. The procurement and installation of each communications system and the associated components and cabling to create a fully functional system.
   3. Thorough testing shall be conducted of each individual communications system to illustrate compliance with specific performance requirements.
   4. Definition and establishment of administration and labeling schemes, conforming to Owner’s requirements.
   5. Securing all necessary permits and licenses, payment of all fees, and provision of all construction work notifications.
   6. Compliance with all applicable laws, ordinances, rules, and regulations.
   7. Mandatory project manager attendance at a weekly project status meeting with the General Contractor.
   8. It is the intent of the project drawings and specifications to provide complete and fully functional Division 27 communication systems, ready for use. Any item, not specifically shown in the project drawings or called for in the project specifications but normally required for a complete system, is to be considered a part of this contract.

G. System Continuity:
   1. Reconnect all existing items that remain in use. Provide all materials and labor required to retain continuity of existing circuits or systems that are disrupted by these alterations even though not indicated on the drawings.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 00 & 01 Specification Sections, apply to this Section.

B. The following documents shall also be considered as a part of and shall relate directly to this section:
   1. Section 13 49 13 - Integrated X-Ray Shielding Assemblies
   2. Section 27 05 05 - SELECTIVE DEMOLITION OF COMMUNICATIONS SYSTEMS.
   3. Section 27 05 26 - GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS.
   4. Section 27 05 28 - PATHWAYS FOR COMMUNICATIONS SYSTEMS.
   5. Section 27 05 44 - SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING.
   6. Section 27 05 53 - IDENTIFICATION FOR COMMUNICATIONS SYSTEMS.
   7. Section 27 10 00 - STRUCTURED CABLING.
   8. Section 27 41 00 - AUDIO-VISUAL SYSTEMS.
   9. Section 27 51 16 - PUBLIC ADDRESS SYSTEMS.
   10. Section 27 51 29.13 - RESCUE ASSISTANCE SIGNALING SYSTEMS.
   11. Section 27 53 19 - DISTRIBUTED ANTENNA SYSTEM.

1.03 ABBREVIATIONS AND ACRONYMS

A. The following definitions are applicable to the work as indicated and as shown herein:
   1. ACR: Attenuation-to-Crosstalk Ration
   2. ADA: Americans with Disabilities Act
   3. AFF: Above Finished Floor
   4. ANSI: American National Standards Institute
   5. APC: Angle Physical Connector
   6. ASTM: American Society for Testing & Materials (ASTM International)
   7. AWG: American Wire Gauge
   8. BBC: Bonding Backbone Conductor
   9. BN: Bonding Network
   10. BICSI: Building Industry Consulting Service International, Inc.
   11. BTU: British Thermal Unit
   12. dB: Decibel
   13. dBmV: Decibel Millivolt
   14. EF: Entrance Facility
   15. EIA: Electronic Industries Association
   16. ELFEXT: Equal Level Far-End Crosstalk
   17. EMC: Electromagnetic Compatibility
   18. EMI: Electromagnetic Interference
   19. EMT: Electrical Metallic Tubing
   20. ER: Equipment Room
   21. ESD: Electrostatic Discharge
   22. FCC: Federal Communications Commission
   23. FD: Floor Distributor
   24. FEXT: Far-End Crosstalk
   25. F/FTP: Overall foil screened cable with foil screened twisted pair.
   26. F/UTP: Overall foil screened cable with unshielded twisted pair.
   27. FTP: Shielded twisted pair.
   28. FOTP: Fiber Optic Test Procedure
   29. Freq: Frequency
   30. GE: Grounding Equalizer (replacing TBBIBC)
   31. HC: Horizontal Cross-Connect
   32. HVAC: Heating, Ventilation, and Air Conditioning
   33. Hz: Hertz

34. IC: Intermediate Cross-Connect
35. IDC: Insulation Displacement Connector
36. IDF: Intermediate Distribution Frame
37. IMC: Intermediate Metal Conduit
38. IEEE: Institute of Electrical and Electronics Engineers
39. ISO: International Organization for Standardization
40. LC: Lucent Connector
41. LCD: Liquid Crystal Display
42. MC: Main Cross-Connect
43. MDF: Main Distribution Frame
44. MHz: Megahertz
45. MM: Multimode
46. NEC: National Electrical Code, NFPA 70
47. NESC: National Electric Safety Code
48. NFPA: National Fire Protection Association
49. NRTL: Nationally Recognized Testing Laboratory
50. OSHA: Occupational Safety and Health Administration
51. OSP: Outside cable Plant
52. OTDR: Optical Time Domain Reflectometer
53. OLTS: Optical Loss Test Set
54. PBB: Primary Bonding Backbone
55. PR: Pair
56. RBB - Rack Bonding Busbar
57. RBC - Rack Bonding Conductor
58. RCDD: Registered Communications Distribution Designer
59. RFI: Radio Frequency Interference
60. RH: Relative Humidity
61. RMC: Rigid Metallic Conduit
62. RNC: Rigid Non-Metallic Conduit
63. S/FTP: Overall braid screened cable with foil screened twisted pair
64. S/UTP: Overall braid screened cable with unshielded twisted pair
65. SC: Subscriber Connector
66. SBB: Secondary Bonding Busbar
67. SE: Service Entrance
68. SM: Single Mode
69. TBB: Telecommunication Bonding Backbone
70. TBC: Telecommunications Bonding Conductor
71. TBBIBC: Telecommunications Bonding Backbone Interconnecting Bonding Conductor
72. TEBC: Telecommunications Equipment Bonding Conductor
73. TGB: Telecommunications Grounding Bus Bar
74. TIA: Telecommunications Industry Association
75. TMGB: Telecommunications Main Grounding Bus Bar
76. TO: Telecommunications Outlet
77. TR: Telecommunications Room
78. UL: Underwriters Laboratory
79. UBC: Unit Bonding Conductor
80. UPS: Uninterruptible Power Supply
81. WAO: Work Area Outlet
82. WAP: Wireless Access Point
83. UTP: Unshielded Twisted Pair

1.04 DEFINITIONS

A. The following definitions are applicable to the work as indicated and as shown herein:

1. APC: Angle Physical Connector - An optical fiber connector that is polished at an angle of 8 to 10 degrees to reduce the back reflection of the signal.
2. Attenuation: The decrease in power of a signal, light beam, or light wave, either absolutely or as a fraction of a reference value. Attenuation is the opposite of gain and is measured in decibels (dB).
3. Backbone System: The cabling and connecting hardware that provides interconnection between Telecommunications Rooms, Equipment Room, and Entrance Facilities.
4. BCT: Bonding Conductor for Telecommunications - A conductor that interconnects the building's service equipment (power ground) to the telecommunications grounding system.
5. Coaxial Cable: A cable composed of an insulated central conducting wire wrapped in another cylindrical conducting wire and then wrapped in another insulating layer and an outer protecting layer.
6. Conduit Chase Pipe: Short section of bushed EMT conduit with sufficient size and capacity to support horizontal cabling bundles from ceiling space, through ceiling tile, onto the ladder tray system connecting wall to rack or cabinet.
7. Cross Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
8. Design Team: A group of individuals comprised of Architect(s) and Engineer(s) involved in assembling the contract documents known as the drawings and specifications.
9. EF: Entrance facility - A location within a building for both public and private network service cables. A facility that provides all necessary mechanical and electrical services for the entry of telecommunications cables into a building and that complies with all relevant regulations. Also referred to as SE: Service Entrance.
10. ER: Equipment Room - A centralized space designed for telecommunications equipment that serves the occupants of a building. Equipment therein is considered distinct from an IDF (Telecommunications Room) because of its nature or complexity. Also frequently referred to as MCR or MDF.
11. F-Connector: (CATV) The final piece of hardware on a cable designed for CATV or DBS or other signal distribution applications. It is cylindrical with a center pin protruding out, that plugs into the set- top box, cable ready TV, satellite receiver, or VCR.
12. Fusion Splicing: An optical fiber splicing method that consists of two clean (stripped of coating) cleaved fibers then joining them and fusing the ends together with an electric arc.
13. GE: Grounding Equalizer - A conductor that interconnects elements of the telecommunications grounding infrastructure (formerly Telecommunications Bonding Backbone Interconnecting Bonding Conductor).
14. Horizontal System: The cabling between, and including, the TO (Telecommunications Outlet) connector and the HC (Horizontal Cross-connect) in the Telecommunications Room.
15. HC: Horizontal Cross-Connect - A group of connectors, such as patch panel or punch down block, that allows equipment and backbone cabling to be cross-connected with patch cords or jumpers. Floor Distributor (FD) is the international term for HC. Also frequently referred to as IDF.
16. Jack: Also commonly called an "outlet", it is the fixed, female connector.
17. J-Hook: A supporting device for horizontal cables that is shaped like a "J". It is attached to some building structures. Horizontal cables are laid in the opening formed by the "J" to provide support for cables.
18. Minor Pathway Support Hardware: Anchors, support brackets, clamps, clips, cable ties, D-rings, rack screws, velcro straps and etc. used to dress and secure cabling, conduits and surface raceways.
19. Multimode Optical Fiber: Optical fiber with a core diameter of 50 or 62.5 micron (micrometer) and a cladding diameter of 125 micron; light wave propagation allows many modes within multimode fiber. Also abbreviated as MM or FOMM.
20. OTDR: Optical Time Domain Reflectometer - An instrument that measures transmission characteristics by sending a series of short light pulses down an optical fiber element/strand and provides a graphic representation of the backscattered light.

21. OLTS: Optical Loss Test Set - A tool, consisting of a stabilized light source and optical power meter, that directly measures loss by computing the difference between the optical power entering a fiber element/strand and the optical power exiting it.
22. Plug: Also commonly called a “connector”, it is the removable, male telecommunications connector.
23. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
24. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
25. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
26. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
27. SC: Subscriber Connector - An “full-size” optical fiber connector used for the termination of both multimode and single mode optical fiber cables (both simplex and duplex), having a square front profile with push-pull latching mechanism.
28. Screen: A metallic layer, either a foil or braid, placed around a pair or group of conductors.
29. SE: Service Entrance - An entrance to a building for both public and private network service cables. A facility that provides all necessary mechanical and electrical services for the entry of telecommunications cables into a building and that complies with all relevant regulations. Also referred to as EF: Entrance Facility.
30. Shield: A metallic layer, either a foil or braid, placed around a group of conductors.
31. Single Mode Optical Fiber: Optical fiber with a relatively small core diameter of 8-9 micron (micrometer) and a cladding diameter of 125 micron; light wave propagation is restricted to a single path, or mode, in single mode optical fiber. Also abbreviated as SM or FOSM.
32. Splice: A joining of conductors meant to be permanent. A device that joins conducting or transmitting media. Also referred to as straight splice.
33. Splice Case: A metal or plastic housing with a semi-cylindrical cavity used to clamp around a cable splice, providing a closure.
34. TE: Telecommunications Enclosure - A case or housing for telecommunications cable terminations and cross-connect cabling.
35. TO: Telecommunications Outlet - A device placed at the user workstation for termination of horizontal media and for connectivity of network equipment. Also referred to as WAO (Work Area Outlet).
36. Transition Splice: A planned splice point, at the building entrance, used to transition from non-rated outdoor to indoor-rated cable designs.
37. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.
38. WAO: Work Area Outlet - A device placed at the user workstation for termination of horizontal media and for connectivity of network equipment. Also referred to as TO (Telecommunications Outlet).

1.05 CODE REFERENCES AND STANDARDS

A. All work shall be in compliance with the following codes and agencies. Nothing contained within these specifications shall be misconstrued to permit work not in conformance with the most stringent of applicable codes and standards. It is assumed that bidders have access to, and specific knowledge of, the listed reference materials in order to ensure conformity with them.
   1. National Electrical Code (NEC)
   2. National Electrical Safety Code (NESC)
   3. National Fire Protection Association (NFPA)
   4. International Building Code (IBC)
   5. Federal, State, and Local Codes.
   6. National Electronic Manufacturer’s Association (NEMA)
   7. Institute of Electronic and Electrical Engineers (IEEE)

8. American National Standards Institute/ Industries Association Telecommunication/ Electronic Industries Association (ANSI/TIA/EIA)
9. Occupational Safety & Health Administration (OSHA)
10. Federal Communications Commission (FCC)

1.06 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of the telephone and internet service provider pathway and entrance with the Electrical Contractor and the Owner's selected carrier.

B. Sequencing: Ensure that any wide area network, telephone service, and internet service connectivity cutover is achieved in a coordinated and orderly manner.

C. All Division 27 Contractor Project Managers shall schedule and conduct a coordination meeting with DAS Information Technology Department to confirm and coordinate scope of work requirements prior to commencement of work. Project meetings shall be scheduled through the Construction Manager.

1.07 SUBMITTALS

A. Refer to Division 1 for exact submittal procedures.

B. The Division 27 Contractor shall provide for review, without exception prior to material acquisition and installation, the following items. Failure to submit required items shall disqualify the bidder.
   1. Product Data Sheets (Catalog Cuts)
   2. Backbone Diagram
   3. Riser Diagram
   4. Cabling Diagram
   5. System Schematics
   6. Signal Flow Diagram
   7. Dimensioned plans, sections and elevations and fabrication details.
   8. Specification Sheets for Test Equipment
   9. Bill of Materials
   10. Contracting Firm Qualifications and Certifications
   11. Installation Team Qualifications by Individual
   12. Current Manufacturer Certifications

C. Provide prior to completion:
   1. Cable data base listing patch panel station cable assignments. Database shall be provided in digital media format when requested by the Construction Manager, DAS or the Design Team. Database shall be submitted to the requesting party within seven (7) calendar days.
   2. Cable administration drawings, as requested to assist in the planning process. Drawings will be requested prior to final documentation.

D. Provide at completion of each construction phase area:
   1. Cable test and certification reports; summary hard copy or full test results on digital media when requested by the owner or design team. Reports shall be submitted to the requesting party within seven (7) calendar days.
   2. One (1) set of record drawings of the actual installation of the Division 27 systems. Drawings shall be given as full size originals and on digital media in AutoCAD format

E. Provide at final completion Closeout Submittals. This shall consist of three (3) bound sets of O&M (Operating and Maintenance) Manuals formatted as defined by Division 1 and one (1) electronic copy provided on digital media. Each copy of the O&M Manual shall include, at minimum, items listed as follows:
   1. Cable test and certification reports; summary hard copy and full test results on digital media. Test results shall be delivered at the completion of each project phase and at any time when called for by the Owner.

2. Provide one (1) full-size hard copy set of record drawings (as-builts) to be submitted to the Design Team for approval, immediately upon completion of the installation.
3. Instruction manuals including equipment and schedules, operating instructions, and manufacturer's instructions.
4. Manufacturer Warranty Certificate.
    a. Warranty contacts including but not limited to names, telephone numbers (office and mobile).
5. Networked Devices
    a. Provide the owner a list of all networked devices including all IP addresses and passwords for devices and managing software.

1.08 QUALITY ASSURANCE

A. Contracting firm shall constitute a company with a minimum of five (5) years successful installation experience with projects utilizing infrastructure and systems work similar to that required for this project.

B. Service Qualifications: Installing and servicing contractor shall have a permanent office within a 120-mile radius of the project site.

C. Cabling Contractor shall have at least one (1) Registered Communications Distribution Designer (RCDD) and installers with Installer-level BICSI Certifications on staff responsible for this project. Provide copies of these certificates in the submittal process.

D. Work crew, not involved in installing cable elements (e.g. laborers delivering/moving materials, installing grounding by an electrician, or workers installing pathway elements) do not require BICSI or manufacturer certification or registration.

E. Contractor shall provide a Manufacturer Certification for the system solution bid, issued directly in the bidder’s company name, valid for the time frame in which the installation will be completed. Contractor shall be manufacturer certified in order to participate in the bid event.

F. The contractor shall be knowledgeable in local, state, regional, and national codes and regulations. All work shall comply with the latest revision of codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall apply.

G. Only installers trained and certified by the proposed manufacturer shall be allowed to install products. Installers must possess the highest level of certification available by the manufacturer for the specific solution being installed.

H. Only installers trained and certified by the proposed manufacturer shall be allowed to install firestop products.

I. Before bidding, the contractor shall study and compare all contract documents and promptly notify the Design Team of any discrepancies or deficiencies discovered by or made known to the contractor.

J. Discrepancies: Whenever a discrepancy or inconsistency exists between related information indicated on the contract drawings and/or specifications, this contractor shall obtain additional clarification and direction from the Design Team before proceeding. For bidding purposes, this contractor shall include the labor and materials necessary to comply with the solution that results in the greatest cost to the contract.
    1. If there is a conflict between applicable documents, then the more stringent requirement shall apply.
    2. The failure to question any controversial item will constitute acceptance by the bidder who shall execute it to the satisfaction of the owner after being awarded the contract.

K. Deficiencies: The contractor and associated subcontractors shall resolve all known deficiencies and omissions, including non-compliance with applicable codes, with the Design Team prior to ordering materials or proceeding with the work. Any work performed prior to receipt of instructions from the Design Team will be done so at the contractor’s risk.

1. If mention has been omitted pertaining to details, items or related accessories required for the completion of any system, it is understood such item and accessories are included in the contract. After the contract is awarded, claims based on insufficient data or incorrectly assumed conditions, or claims based on misunderstanding the nature of the work, will not be recognized.
2. All devices, symbols and work illustrated shall be new work provided under this contract except work labeled existing to remain and equipment labeled to be furnished (or supplied) by others but installed by this contractor.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Equipment, materials, and supplies shall be shipped, handled and stored in ways that shall prevent damage to the items.

B. All items shall be handled and stored as recommended by the manufacturer.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under manufacturer's specified conditions, and free from damage or deterioration.

D. Equipment, materials, and supplies to be incorporated in the area of work shall be new unless otherwise specified.

E. Equipment, materials, and supplies shall be produced in a good workmanlike manner.

F. When the quality of a material, process, or article is not specifically set forth in the Drawings or Specifications, the best available quality of the material, process, or article shall be provided.

1.10 PROJECT CONDITIONS

A. Conditions and Measurements: Visit the jobsite to verify installation conditions and confirm measurements for all required systems and associated cabling connectivity.

1.11 WARRANTY

A. The Contractor shall submit, in the bid documents, any additional contractor-specific warranties or guarantees to be offered on the project.

B. The Contractor shall supply any and all necessary documentation needed to process and record the warranty(s) and to verify the installation solution.

C. ~~Data Cabling System Warranty~~ (ADDENDUM #2)

1. ~~All cabling systems shall include a minimum twenty-five (25) year application assurance warranty as a manufacturer registered system installation. During the warranty period, and for non-conformities of which contractor has notice, contractor shall take all necessary and appropriate action; free of charge, to correct any non-conformity with the warranties contained in the manufacturer agreement. During the warranty period, contractor shall provide to the Owner, free of costs and charges, all support necessary to ensure that the cabling system meets the requirements specified in this document and performance guarantees provided by the contractors. During the warranty period, contractors shall furnish, or cause to be furnished, all maintenance, service, parts and replacements necessary to maintain the cabling system in good working condition, at no cost to the Owner.~~
2. ~~The contractor shall supply a full manufacturer's application assurance warranty for all new installations, to include approved termination hardware and cabling media from the proposed manufacturer's list of approved materials. Services to be provided by this contractor to the Owner during the warranty period shall include, without limitation, the following:~~
   a. ~~Remedial Maintenance~~
      1) ~~Contractor shall provide service on the Owner's site as necessary including, but not limited to, fault isolation, diagnosis, and repair.~~
   b. ~~Maintenance Records~~
      1) ~~Contractor shall maintain, at the jobsite, a current record of the cabling system configuration.~~

c. ~~Replacement Parts~~
   1) ~~Contractor shall provide and install replacement parts, including new components.~~

D. All Other Communications Systems Warranty
   1. Unless listed elsewhere within these specifications, a warranty shall be provided for a minimum of one (1) year for all other communications systems listed. One year shall begin from the date of Substantial Completion. This warranty shall cover both product and service to address remedial maintenance and replacement parts as is appropriate to keep each system complete and fully functional.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. If a Bidder proposes to Substitute an article, device, material, equipment, form of construction, fixture, or item other than the approved manufacturers and part numbers, listed and named in the Specifications, the Bidder shall certify that the proposed item is equal in quality and all aspects of performance and appearance, to the items specified. The Bidder shall submit a request for Substitution to the Design Team by following the instruction in Specification Section 01 6000, which must include:
   1. The name and complete description of the proposed Substitution including Drawings, performance and test data, and other information necessary for a complete evaluation; and
   2. A statement setting forth any changes that the Proposed Substitution will require in the Contract Documents or the project.

B. If the Design Team approves the Proposed Substitution, the Design Team shall issue an Addendum. If the Design Team does not approve the substitution, the Design Team shall inform the Bidder of its decision, which is final. The Design Team may reject a proposed Substitution because the Bidder failed to provide sufficient information to enable the Design Team to completely evaluate the Proposed Substitution without causing a delay in the scheduled bid opening.
   1. Proposed Substitutions received by the Design Team after the allotted time allowed by Section 01 6000 shall not be considered.

C. Bidder shall confirm all reference part numbers, listed within Division 27, as current and suitable for the items described and specified and shall file a formal RFI for all perceived discrepancies prior to bidding.
   1. All materials associated with reference parts shall be included so as to constitute a complete and functional system, whether or not specifically identified and itemized.

2.02 ASSEMBLIES

A. Sleeves and Pathways for Cabling:
   1. Where additional conduits are needed beyond those shown on the drawings to accommodate the installation of systems cabling, this contractor (Division 27) shall include such provisions in this contract. Provide conduit suitable for its application and sized in accordance with industry standards. Include nylon bushings at conduit ends and firestopping as required around conduits wherever building barriers are penetrated. If necessary, this contractor shall hire a qualified contractor to perform this work.

PART 3 - EXECUTION

3.01 CLEANING

A. Division 27 Contractor shall thoroughly clean all assemblies within the telecommunications room’s space before they are turned over to the DAS IT Services for operation. Cleaning shall include, but not be limited to, all ladder tray, racks and wire managers (both inside and out), copper and optical fiber panels (both inside and out). Should any telecommunications room or closet be completed prior to the balance of the floor space construction that it serves, racks,

cabinets, and wall frames shall be covered with plastic sheeting to repel dust and other contaminants to which they will be subjected.

B. At the end of each workday or shift, the Contractor shall be required to clean-up the work area and remove all construction debris such that the site is clean and usable without hazard to workers.

3.02 PROJECT CONDITIONS

A. The Owner shall not be responsible for delays in work because of shutdowns due to unsafe working practices by Contractors.

B. The active information transport system and cabling associated with specific work beyond the construction area shall not be disrupted at any time.

C. Contractor shall clean work areas each day and remove debris properly and legally from the project site. Materials and supplies stored for use in the project shall be neatly stacked outside the circulation areas. All exits and paths shall be cleaned so as to prevent dirt from being tracked into the site.

D. It shall be the responsibility of the Contractor to secure any parking permits prior to the first day of work on-site.

E. Work outside of normal operating hours and days shall be coordinated with DAS.

3.03 SAFETY REQUIREMENTS

A. All contract work shall be performed in accordance with the policies, procedures, and standards established by the Owner.

B. In construction areas, all Contractor personnel shall wear personnel protection devices, as deemed appropriate by the Construction Manager and as required by OSHA for the work location and work operation being performed. Devices shall include, but not be limited to hardhats, work boots, safety eye protection, reflective vests, etc.

C. All exposed holes, pits, pipes, etc., either inside or outside the project site, shall be barricaded or plated and adequately secured when Contractor personnel are not present. All ladders, hanging wires, pipes, and other items protruding at a pedestrian level travel way most be removed or secured following the final shift of the day.

D. During breaks or when only a portion of work has been completed, tools shall not be left exposed where others may risk injury or attempt to use them. Windows and doors shall not be left unsecured or propped open during breaks. At the completion of the final shift each day, doors, windows, or other openings shall be adequately secured.

E. When driving on the Owner's property, Contractor personnel shall observe all traffic safety regulations and pay particular attention to pedestrians. All loose material and debris on vehicles shall be adequately secured and tied down.

END OF SECTION

SECTION 27 10 00
STRUCTURED CABLING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Communications system design requirements.

B. Communications pathways.

C. Copper cable and terminations.

D. Fiber optic cable and interconnecting devices.

E. Communications equipment room fittings.

F. Communications outlets.

G. Communications grounding and bonding.

H. Communications identification.

1.02 RELATED REQUIREMENTS

A. Section 13 49 13 - Integrated X-Ray Shielding Assemblies

B. Section 27 00 00 - GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS.

C. Section 27 05 26 - GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS.

D. Section 27 05 28 - PATHWAYS FOR COMMUNICATIONS SYSTEMS.

E. Section 27 05 36 - CABLE TRAYS FOR COMMUNICATIONS SYSTEMS.

F. Section 27 05 43 - UNDERGROUND DUCTS AND RACEWAYS FOR COMMUNICATION SYSTEMS.

G. Section 27 05 44 - SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING.

H. Section 27 05 53 - IDENTIFICATION FOR COMMUNICATIONS SYSTEMS.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate requirements for service entrance and entrance facilities with Communications Service Provider.
2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications equipment.
3. Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.
4. Notify the Design Team of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

A. Refer to Section 27 00 00 - GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS.

1.05 QUALITY ASSURANCE

A. Refer to Section 27 00 00 - GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 27 00 00 - GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS.

1.07 WARRANTY

A. Refer to Section 27 00 00 - GENERAL REQUIREMENTS FOR COMMUNICATIONS SYSTEMS.

PART 2 PRODUCTS

2.01 SYSTEM DESIGN

A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets. Cabling shall be pulled by contractor, but Owner's Vendor, ICN, shall provide jacks and terminate all Category cabling.
   1. Comply with TIA-568 (SET) (cabling) and TIA-569 (pathways) (commercial standards).
   2. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party independent testing laboratory certified.
   3. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F at relative humidity of 0 to 95 percent, noncondensing.
   4. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors, and other air-handling spaces.

B. System Description:
   1. Building Entrance Cable: By others.
   2. Backbones - Within Building: Fiber optic, _____ -fiber.
   3. Provide infrastructure and outlets where indicated on drawings.

C. Main Distribution Frame (MDF): Centrally located support structure for terminating horizontal cables that extend to telecommunications outlets and backbone cables that extend to intermediate distribution frames (IDFs), functioning as point of presence to external service provider.
   1. Locate main distribution frame as indicated on the drawings.
   2. Capacity: As required to terminate all cables required by design criteria plus minimum 25 percent spare space.

D. Intermediate Distribution Frames (IDF): Support structures for terminating horizontal cables that extend to telecommunications outlets.
   1. Locate intermediate distribution frames as indicated on the drawings.

E. Backbone Cabling: Cabling, pathways, and terminal hardware connecting intermediate distribution frames (IDF's) with main distribution frame (MDF), wired in star topology with main distribution frame at center hub of star.

F. Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".

2.02 PATHWAYS

A. Conduit, Pull Boxes, and Hooks: As specified in Section 27 05 28 - PATHWAYS FOR COMMUNICATIONS SYSTEMS; provide pull cords in all conduit.

B. Cable Trays: As specified in Section 27 05 36 - CABLE TRAYS FOR COMMUNICATIONS SYSTEMS.

C. Firestop Sleeves: As specified in Section 27 05 44 - SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING

2.03 COPPER CABLE

A. Manufacturers:
   1. CommScope
   2. Belden
   3. Panduit
   4. Leviton (ADDENDUM #2)
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Copper Horizontal Cable:

1. Description: 100 ohm, balanced twisted pair cable complying with TIA-568.2 and listed and labeled as complying with UL 444.
2. Cable Type: Voice and Work Area Outlet Data: TIA-568.2 Category 6 UTP (unshielded twisted pair); 23 AWG.
    a. Base Bid shall be Cat6 cabling to Work Area Outlets.
    b. Alternate #4 shall be Cat6A cabling to Work Area Outlets
3. Cable Type - Wireless TIA-568.2 Category 6A UTP (unshielded twisted pair); 23 AWG.
    a. Color: Blue
    b. Base Bid shall include Cat6A to all Wireless Access Point locations.
4. Cable Type - Surveillance Cameras TIA-568.2 Category 6 UTP (unshielded twisted pair); 23 AWG.
    a. Color: Blue
    b. Base Bid shall be Cat6 cabling to Camera locations
    c. Alternate #4 shall be Cat6A cabling to Camera locations
5. Cable Capacity: 4-pair.
6. Cable Applications: Use listed NFPA 70 Type CMP plenum cable unless otherwise indicated.
7. Product(s):
    a. CommScope; Uniprise Twisted Pair Cables; CS37 Series Category 6 U/UTP Cable.
    b. Belden; DataTwist Twisted Pair Cables; 2400 Series Category 6 U/UTP Cable.
    c. Panduit; Twisted Pair Cables; TX6500 Series Category 6 U/UTP Cable
    d. Leviton; Twisted Pair Cables; LANmark 1000 Series Category 6 U/UTP Cable (ADDENDUM #2)

C. Copper Cable Terminations: Owner's Vender, ICN, shall provide all category cabling jacks and will terminate and test all cabling.

2.04 FIBER OPTIC CABLE AND INTERCONNECTING DEVICES

A. Manufacturers:
1. Corning
2. CommScope
3. Belden
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fiber Optic Backbone Cable - Indoor Non-Conductive:
1. Description: Tight buffered, non-conductive fiber optic cable complying with TIA-568.3, TIA-598, ICEA S-83-596 and listed as complying with UL 444 and UL 1651.
2. Cable Type: Single-mode, 8.3/125 um (OS1) complying with TIA-492CAAA.
3. Cable Capacity: _____ -fiber.
4. Cable Applications:
    a. Plenum Applications: Use listed NFPA 70 Type OFNP plenum cable.
5. Cable Jacket Color:
    a. Single-Mode Fiber (OS1/OS2): Yellow.
6. Product(s):
    a. CommScope Fiber Optic Cables; TeraSpeed Zero Water Peak Single-Mode Fiber.

C. Fiber Optic Backbone Cable Indoor Conductive:
1. Description: Tight buffered, armored/conductive fiber optic cable complying with TIA-568.3, TIA-598, ICEA S-83-596 and listed as complying with UL 444 and UL 1651.
2. Cable Type: Single-mode, 8.3/125 um (OS1) complying with TIA-492CAAA.
3. Cable Capacity: _____ -fiber.
4. Cable Applications:
    a. Plenum Applications: Use listed NFPA 70 Type OFCP plenum cable.
5. Cable Jacket Color:
    a. Single-Mode Fiber (OS1/OS2): Yellow.
6. Product(s):

a. CommScope Fiber Optic Cables; TeraSpeed Zero Water Peak Single-Mode Fiber.

2.05 COMMUNICATIONS EQUIPMENT ROOM FITTINGS

A. Copper Cross-Connection Equipment:
1. Patch Panels for Copper Cabling: Sized to fit EIA/ECA-310 standard 19 inch wide equipment racks; 0.09 inch thick aluminum; cabling terminated on Type 110 insulation displacement connectors; printed circuit board interface.
a. Capacity: Provide ports sufficient for cables to be terminated plus 25 percent spare.
b. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively; comply with TIA-606.
c. Provide incoming cable strain relief and routing guides on back of panel.
2. Product(s):
a. Modular patch panels (flat) compatible with the approved copper cabling and connector products.

B. Fiber Optic Cross-Connection Equipment:
1. Manufacturers:
a. Corning
b. CommScope
c. Belden
d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Patch Panels for Fiber Optic Cabling: Sized to fit EIA/ECA-310 standard 19 inch wide equipment racks; 0.09 inch thick aluminum.
a. Adapters: As specified above under FIBER OPTIC CABLE AND INTERCONNECTING DEVICES; modular cassette(s) with a maximum of 24 duplex adaptors per standard panel width.
b. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively; comply with TIA-606.
c. Provide incoming cable strain relief and routing guides on back of panel.
d. Provide rear cable management tray at least 8 inches deep with removable cover.
e. Provide dust covers for unused adapters.
f. Quantity: Provide cassette(s) to terminate all incoming/outgoing strands of fiber.
3. Product(s):
a. Corning; Closet Connector Housing; CCH Series Enclosures.
b. Commscope; SD Series Enclosures.
c. Belden; FX ECX Series Enclosures.

C. Backboards: AC plywood without voids, 3/4 inch thick; UL-labeled fire-retardant.
1. Size: As indicated on drawings.
2. Do not paint over UL label.

D. Equipment Frames, Racks and Cabinets:
1. Manufacturers:
a. Chatsworth
b. Hoffman
c. Ortronics
d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Component Racks: EIA/ECA-310 standard 19 inch wide.
3. Wall Mounted Racks: Steel construction, hinged to allow access to back of installed components.
4. Floor Mounted Racks: Aluminum or steel construction with corrosion resistant finish; vertical and horizontal cable management channels, top and bottom cable troughs, and grounding lug.
5. Locks: Keyed alike.
6. Product(s):
a. Refer to the Drawings for specific requirements.

E. Cable Management:
   1. Manufacturers:
      a. Chatsworth
      b. Hoffman
      c. Ortronics
   2. Product(s):
      a. Refer to the Drawings for specific requirements.

2.06 GROUNDING AND BONDING COMPONENTS

A. Comply with TIA-607.

B. Comply with Section 27 05 26 - GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS.

2.07 IDENTIFICATION PRODUCTS

A. Comply with TIA-606.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Comply with latest editions and addenda of TIA-568 (SET) (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), BICSI N1, NFPA 70, and SYSTEM DESIGN as specified in PART 2.

B. Comply with Communication Service Provider requirements.

C. Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.

D. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

3.02 INSTALLATION OF PATHWAYS

A. Install pathways with the following minimum clearances:
   1. 48 inches from motors, generators, frequency converters, transformers, x-ray equipment, and uninterruptible power systems.
   2. 12 inches from power conduits and cables and panelboards.
   3. 5 inches from fluorescent and high frequency lighting fixtures.
   4. 6 inches from flues, hot water pipes, and steam pipes.

B. Conduit, in Addition to Requirements of Section 27 05 28 - PATHWAYS FOR COMMUNICATIONS SYSTEMS:
   1. Arrange conduit to provide no more than the equivalent of two 90 degree bend(s) between pull points.
   2. Conduit Bends: Inside radius not less than 10 times conduit internal diameter.
   3. Arrange conduit to provide no more than 100 feet between pull points.
   4. Do not use conduit bodies.

3.03 INSTALLATION OF EQUIPMENT AND CABLING

A. Cabling:
   1. Do not bend cable at radius less than manufacturer's recommended bend radius; for unshielded twisted pair use bend radius of not less than 4 times cable diameter.
   2. Do not over-cinch or crush cables.
   3. Do not exceed manufacturer's recommended cable pull tension.
   4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage outer jacket.

B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
   1. At Distribution Frames: 120 inches.
   2. At Outlets - Copper: 12 inches.

3. At Outlets - Optical Fiber: 39 inches.

C. Copper Cabling:
1. Category 5e and Above: Maintain cable geometry; do not untwist more than 1/2 inch from point of termination.
2. For 4-pair cables in conduit, do not exceed 25 pounds pull tension.

D. Fiber Optic Cabling:
1. Prepare for pulling by cutting outer jacket for 10 inches from end, leaving strength members exposed. Twist strength members together and attach to pulling eye.
2. Support vertical cable at intervals as recommended by manufacturer.

E. Wall-Mounted Racks and Enclosures:
1. Install to plywood backboards only, unless otherwise indicated.
2. Mount so height of topmost panel does not exceed 78 inches above floor.

F. Floor-Mounted Racks and Enclosures: Permanently anchor to floor in accordance with manufacturer's recommendations.

G. Identification:
1. Use wire and cable markers to identify cables at each end.
2. Use identification nameplate to identify cross-connection equipment, equipment racks, and cabinets.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Comply with inspection and testing requirements of specified installation standards.

C. Visual Inspection:
1. Inspect cable jackets for certification markings.
2. Inspect cable terminations for color coded labels of proper type.
3. Inspect outlet plates and patch panels for complete labels.
4. Inspect patch cords for complete labels.

D. Final Testing will be completed by owners Vendor after all cabling is terminated.

END OF SECTION