TO ALL BIDDERS OF RECORD:

This Addendum forms a part of the Contract Documents and modifies the Drawings and Project Manual as hereinafter indicated.

1) General

Filed sub-bid submission deadline has been change from July 11, 2024 to **July 16, 2024 10:00 AM EST**.

2) BIDDER'S QUESTIONS

Q: Also, in Addendum 2 it stated to include unit prices with bid forms. Does that mean to submit the specs page for units because there is no unit price form? Please advise.

A: Submit the Unit Prices on the form included in section 012200 Unit Prices as and attachment to the bid form.

Q: Filed Sub-Bid Forms A305-2020 - The above forms are stated in Addendum 2 that they are required with Bid Submission. These forms seem to be for General Contractors. Please clarify.

A: Filed Sub-Bidders are not required to submit Forms A305-2020

Q: Please note that Set 1 from Drawing A(900); Mortise lock and room exit devise cannot be used on the same door.

A: Refer to reissued Sheet A900 for updated hardware sets.

Q: Refer to the door schedule on Drawing A900. Please confirm the material of the frames of the 2 doors. Door A100.1 calls out an aluminum frame but there isn't a spec section.

A: Door 100.1 will be storefront. Refer to reissued Sheet A900 for update door schedule as well as reissued Section 08 80 00 GLASS AND GLAZING and issued section 08 41 13ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.

a. PROJECT MANUAL

1) In section 00 00 10 TABLE OF CONTENTS, add the following sections:
   2. After Section 08 33 20 OVERHEAD SECTIONAL DOORS add:
      08 41 13 ..... ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS 10

3) In section 00 00 10 TABLE OF CONTENTS, change page number for the following sections:
   01 .22 00 ..... UNIT PRICES 3
   02 .80 00 ..... GLASS AND GLAZING 11

4) In the project manual the following sections have been issued:
   2. 08 41 13 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

5) In the project manual, replace the following with the updated sections:
   1. 08 80 00 GLASS AND GLAZING
   2. 01 22 00 UNIT PRICES

1) Section 08 70 00 BUILDERS HARDWARE, omit hardware schedule at the end of the section.

3. DRAWINGS

Reissued Drawings:

1. Replace the following Mechanical Drawings with reissued drawings with addendum #3 dated 7/11/2024:

   P200 PLUMBING PLAN

2. Replace the following Mechanical Drawings with reissued drawings with addendum #3 dated 7/11/2024:

   M100 MECHANICAL PLAN

3. Replace the following Electrical Drawings with reissued drawings with addendum #3 dated 7/11/2024:

   ES100 ELECTRICAL SITE PLAN
   E200 ELECTRICAL LIGHTING AND POWER PLANS

4. ATTACHMENTS

1. 01 22 00 UNIT PRICES
2. 08 41 13 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
3. 08 80 00 GLASS AND GLAZING
4. Updated Plan holder's list

(THIS COMPLETES ADDENDUM NO. 3)

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 REQUIREMENTS INCLUDED

A. The undersigned agrees that the following unit prices are applicable for additional or deductive work required from that as specified or shown on the Contract Documents. The prices herein established are for additional work and include the net cost plus overhead and profit. For reductions in the work (lesser quantities), 85% of the dollar value of listed prices below (B) items will apply to account to the contractor's fees listed under (A) items.

B. The following Unit Prices will constitute the basis for additions and deductions to the Contract as may be required during the life of the Contract:

C. The following sections include Unit Price work and General Contractors and Filed Sub-Bid Subcontractors submitting bids for work for these sections must submit Unit Price sheets with their bids and include the total of unit price work in their total bid price for all work.

D. Sections with Unit Price work:

1. Hand Earth Excavation

a. Description: Hand earth excavation, to five feet depth, left on site, as directed

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 cu yd. (cubic yard) over the assumed 50 cu. yd., as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per 1 cu yd. (cubic yard) under the assumed 50 cu. yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

2. Trench and Pit Earth Excavation

a. Description: Machine earth excavation, to five feet depth, left on site, as directed

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 cu yd. (cubic yard) over the assumed 1,500 cu. yd., as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per 1 cu yd. (cubic yard) under the assumed 1,500 cu. yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

3. **Extra Backfill**

a. Bring and place onsite from approved offsite location, machine placed, as directed.

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 sq. yd. (square yard) over the assumed 2,750 sq yd, as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per per 1 sq. yd. (square yard) under the assumed 2,750 sq yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

4. Excavated Rock Removal

a. Remove rock found on site, to offsite location.

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 cu yd. (cubic yard) over the assumed 75 cu. yd., as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per 1 cu yd. (cubic yard) under the assumed 75 cu. yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

5. Back Run Gravel Borrow

a. Bring and place onsite approved offsite material, machine placed, as directed.

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 cu yd. (cubic yard) over the assumed 100 cu. yd., as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per 1 cu yd. (cubic yard) under the assumed 100 cu. yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

6. Concrete in-place

a. Concrete in-place, excluding forms, reinforcement 3500 psi and 4000 psi.

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 cu yd. (cubic yard) over the assumed 300 cu. yd., as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per 1 cu yd. (cubic yard) under the assumed 300 cu. yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

7. Reinforcing Steel

a. Provide and installed reinforcing steel, as approved for foundations and slabs.

b. **Additions:** The Owner shall compensate the Contractor $_____ per lb (pound) over the assumed 21,000 lb., as confirmed by the Architect and submitted to the Owner in writing.

c. Deductions: The contractor shall credit the Owner $_____ per per lb (pound) under the assumed 21,000 lb., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

8. General Fill

a. Bring and place onsite from approved offsite material, machine placed, as directed.

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 cu yd. (cubic yard) over the assumed 2,000 cu. yd., as confirmed by the Architect and submitted to the Owner in writing.

c. **Deductions:** The contractor shall credit the Owner $_____ per 1 cu yd. (cubic yard) under the assumed 2,000 cu. yd., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

9. Bituminous Pavement

a. Bituminous concrete pavement including binder base and sub-base, in accordance with industry standard methods for “Asphalt Paving.”

b. **Additions:** The Owner shall compensate the Contractor $_____ per 1 sq ft. (square foot) over the assumed 31,000 sq ft., as confirmed by the Architect and submitted to the Owner in writing.

c. **Deductions:** The contractor shall credit the Owner $_____ per sq ft. (square foot) under the assumed 31,000 sq ft., as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

10. Fine Grading and Seeding

a. Fine grading and seeding for general lawns in accordance with Division 32, Section "Planting."

b. **Additions:** The Owner shall compensate the Contractor $_____ per MSF (1,000 square feet) over the assumed 10 MSF, as confirmed by the Architect and submitted to the Owner in writing.

c. **Deductions:** The contractor shall credit the Owner $_____ MSF (1,000 square feet) under the assumed 10 MSF, as confirmed by the Architect and submitted to the Owner in writing. Value (B) represents 85% of the dollar value of (A)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 22 00

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
   1. Glazed aluminum-framed storefront systems and accessories.
   2. Manual-swing aluminum doors and hardware.
   3. Glass and glazing for the work of this Section, as specified in Section 088000 - GLAZING.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Install the following items as furnished by the designated Sections:
   1. Section 087100 - DOOR HARDWARE:
      a. Lock cylinders.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
   1. Section 079200 - JOINT SEALANTS for perimeter joint sealants.
   2. Section 084413 - Glazed ALUMINUM Curtain Walls for curtain-wall systems that mechanically retain glazing on four sides.
   3. Section 087100 - Door Hardware for lock cylinders and keying.
   4. Section 089000 - Louvers AND VENTS for units installed with aluminum-framed systems.
   5. Section 260001 - ELECTRICAL WORK for conduits and junction boxes within frames for access control devices.

F. Related Requirements: Refer to the following Sections for technical requirements relating to Work of this Section:
   1. Section 079200 - JOINT SEALANTS for sealant requirements to the extent not specified in this Section.
   2. Section 088000 - Glazing for glazing requirements to the extent not specified in this Section.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design entrance and storefront system, including comprehensive engineering analysis by a qualified professional engineer licensed in the Commonwealth of Massachusetts, using performance requirements and design criteria indicated.

B. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
   1. Structural loads.
   2. Thermal movements.

3. Dimensional tolerances of building frame and other adjacent construction.
4. Failure includes the following:
   a. Deflection exceeding specified limits.
   b. Thermal stresses transferred to building structure.
   c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
   d. Noise or vibration created by wind, thermal and structural movements.
   e. Loosening or weakening of fasteners, attachments, and other components.
   f. Sealant failure.
   g. Failure of operating units to function properly.

C. Structural Loads: Wind and seismic loads as indicated on the Structural Drawings, but not less than that required by Code.

D. Interstory Drift: Accommodate design displacement of adjacent stories indicated.
1. Design Displacement: As indicated on Drawings.
2. Test Performance: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.4 at design displacement [and 1.5 times the design displacement].

E. Seismic Performance: Provide aluminum-framed entrances and storefronts, and components capable of withstanding the effects of earthquake motions determined according to Code.
1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.6 at design displacement [and 1.5 times the design displacement].
2. Vertical Interstory Movement: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.7 at design displacement [and 1.5 times the design displacement].

F. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller, amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below to less than 1/8 inch and clearance between members and operable units directly below to less than 1/16 inch.

G. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

H. Air Infiltration Test: Test unit in accordance with ASTM E 283, as follows:
1. Static Air Pressure Difference: 6.24 psf for fixed storefront units, and 1.567 psf for doors.
2. Performance: Maximum air leakage shall not exceed the following: fixed storefront units, 1.0 cfm/sf.: glazed entrance door units, 0.3 cfm/sf of other areas.

I. Water Leakage Test: Test fixed framing system in accordance with ASTM E 331.
1. Test Pressure: 8 psf.

2. Performance: No leakage as defined in test method at specified test pressure. No uncontrolled water penetrating system or appearing on normally exposed interior surfaces.

J. Solar Heat-Gain Coefficient: Provide units with a whole-unit SHGC maximum as required by Code, determined according to NFRC 200 procedures. Submit proof of compliance with submittals as specified.

K. Thermal Transmittance: Provide window units that have a U-value as required by Code rated in BTU/hour/sq. ft./degrees F at 15-mph exterior wind velocity, when tested in accordance with AAMA 1503.1. Test unit to be 4 ft. x 6 ft. Submit proof of compliance with submittals as specified.

L. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45 for fixed storefront units and not less than 48 for doors when tested according to AAMA 1503.

1.4 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.

B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
1. Include structural analysis data signed and sealed by the qualified professional engineer registered in the Commonwealth of Massachusetts responsible for their preparation.
2. Include structural analysis of story drift and deflection from anticipated live loads, and determination whether head receptors are required.
3. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
4. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
5. All costs for professional engineering shall be included in the bid price for the Work of this Section.

C. Delegated-Design Submittal: For entrance and storefront systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the Commonwealth of Massachusetts responsible for their preparation.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Qualification Data: For Installer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems.

G. Performance Reports: Based on systems, components and glazing methods proposed for use on this Project, proof that units as glazed for this Project meet or exceed Code requirements for the following:
1. U-value.
2. Solar heat-gain coefficient.

H. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.

I. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer licensed in the Commonwealth of Massachusetts.

B. Professional Engineer Qualifications: A professional engineer licensed in the Commonwealth of Massachusetts and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of entrance and storefront systems that are similar to those indicated for this Project in material, design, and extent.

C. Installer Qualifications: Capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.
   1. Engineering Responsibility: Preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.

D. Accessible Entrances: Comply with Massachusetts Architectural Access Board and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating aluminum-framed systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Noise or vibration created by wind and thermal and structural movements.
      c. Deterioration of metals and other materials beyond normal weathering.
      d. Water penetration through fixed glazing and framing areas.
      e. Failure of operating components.
   2. Warranty Period: 10 years from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.

1. Warranty Period: 10 years from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Storefront, 2 inch by 4-1/2 inch profile:
      a. EFCO, a Pella Company, S-402.
      b. Kawneer North America, VG.
      c. Oldcastle BuildingEnvelope, 3000T.
      d. Tubelite Inc., E14000.
      e. United States Aluminum, 451.
      f. YKK AP America Inc., YES 45 FI.
      g. Or equal.
      h. Inc., YES 40 FS.
      i. Or equal.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
   1. Sheet and Plate: ASTM B 209.
   2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
   3. Extruded Structural Pipe and Tubes: ASTM B 429.
   4. Structural Profiles: ASTM B 308/B 308M.
   5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
   1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
   2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
   3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
   1. Construction: Thermal-break.

B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
   2. Reinforce members as required to receive fastener threads.
   3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

E. Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed flashing from sheet aluminum finished to match framing and of sufficient thickness to maintain a flat appearance without visible deflection.

F. Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type.

2.4 GLAZING SYSTEMS

A. Glazing: Provide insulating-glass units in accordance with requirements in Section 088000 – GLASS AND GLAZING.

B. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

2.5 DOORS

A. Doors: Manufacturer's standard glazed doors, for manual swing operation.
   a. Door Construction: Mechanical clip fastening, SIGMA deep penetration plus welds and 1-1/8 inch long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type and EPDM glazing gaskets reinforced with non-stretchable cord.

2.6 DOOR HARDWARE

A. Hardware Sets:

   1. Opening-Force Requirements:
      a. Egress Doors: Not more than 30 lbf required to set door in motion and not more than 15 lbf required to open door to minimum required width.
      b. Accessible Interior Doors: Not more than 5 lbf.

B. Pivot Hinges: BHMA A156.4, Grade 1.

C. Locking Devices, General: Do not require use of key, tool, or special knowledge for operation.
   1. Opening-Force Requirements:
      a. Delayed-Egress Locks: Lock releases within 15 seconds after applying a force of not more than 15 lbf for not more than 3 seconds.
      b. Latches and Exit Devices: Not more than 15 lbf required to release latch.

D. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.

E. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
   1. Standard: BHMA A156.3, Grade 1.

F. Cylinders: As specified in Section 087100 – BUILDER'S DOOR HARDWARE.

G. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.

H. Operating Trim: BHMA A156.6.

I. Closers: With accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use, and adjustable to meet field conditions and requirements for opening force.
   1. Standard: BHMA A156.4, Grade 1.

J. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.

K. Weather Stripping: Manufacturer's standard replaceable components.
   1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.

L. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

M. Thresholds: Raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.
   1. Standard: BHMA A156.21.

2.7 ACCESSORY MATERIALS

A. Insulating Materials: As specified in Section 072100 - THERMAL INSULATION.

B. Bituminous Paint (Isolation Coating): Cold-applied asphalt-mastic paint complying with ASTM D 1187 requirements containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

A. Form aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints with ends coped or mitered.
   3. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
   4. Physical and thermal isolation of glazing from framing members.
   5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing (without projecting stops).

E. Door Frames: Reinforce as required to support loads imposed by door operation and for installing hardware.

1. At exterior doors, provide compression weather stripping at fixed stops.
2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.

F. Doors: Reinforce doors as required for installing hardware.
1. At pairs of exterior doors, provide sliding weather stripping retained in adjustable strip mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.

G. Hardware Installation: Factory install hardware to the greatest extent possible. Cut, drill, and tap for factory-installed hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. High-Performance Organic Finish (3-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
1. Color and Gloss: As selected by Designer from manufacturer's full range, including metallics.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight, unless otherwise indicated.

B. Metal Protection:
1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.

2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components necessary to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 - JOINT SEALANTS and to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, without warp or rack.

F. Install glazing as specified in Section 088000 – GLASS AND GLAZING.
1. Structural-Sealant Glazing:
   a. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
   b. Install weatherseal sealant according to Section 079200 - JOINT SEALANTS and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

G. Entrances: Install to produce smooth operation and tight fit at contact points.
1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

H. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:
1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
2. Alignment:
   a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
   b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
3. Diagonal Measurements: Limit difference between diagonal measurement to 1/8 inch.

3.3 FIELD QUALITY CONTROL

A. Cooperate with field quality control personnel. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.

B. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at Contractor's expense.

C. Testing Services: Testing and inspecting of representative areas to determine compliance of installed systems with specified requirements shall take place as follows and in successive stages as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.
1. Air Infiltration: Areas shall be tested for air leakage of 1.5 times the rate specified for laboratory testing under Part 1 "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft.
2. Water Penetration: Areas shall be tested according to ASTM E 1105 at a minimum cyclic static-air-pressure difference of 0.67 times the static-air-pressure difference specified for

laboratory testing under Part 1 "Performance Requirements" Article, but not less than 4.18 lbf/sq. ft., and shall not evidence water penetration.

3. Water Spray Test: Before installation of interior finishes has begun, a minimum area of 75 feet by 1 story of aluminum-framed systems designated by Designer shall be tested according to AAMA 501.2 and shall not evidence water penetration.

D. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.

3.4 ADJUSTING

A. Entrances: Adjust operating hardware for smooth operation according to hardware manufacturers' written instructions.

1. For doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch measured to the leading door edge.

END OF SECTION 08 41 13

SECTION 088000 – GLASS ABD GLAZING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Glass and glazing for the following Sections:
   a. Section 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1.3 DEFINITIONS

A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.

D. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

E. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

F. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Specified Design Wind Loads: As required by Code.

b. Specified Design Snow Loads for Sloped Glazing: As required by Code.
c. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.

1) Load Duration: 60 seconds or less/

d. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow action.

1) Load Duration: 30 days.

e. Maximum Lateral Deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch, whichever is less.

1) For monolithic-glass lites heat-treated to resist wind loads.
2) For insulating glass.
3) For laminated-glass lites.

f. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
   1. For insulating-glass units, properties are based on units with lites 6.0 mm thick and a nominal 1/2-inch-wide interspace.
   2. Center-of-Glass Values: Based on using LBL-44789 WINDOW 6.3 computer program for the following methodologies:

      a. U-Factors: NFRC 100 expressed as Btu/ sq. ft. x h x degrees F.
      b. Solar Heat Gain Coefficient: NFRC 200.
      c. Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Samples: 12-inch- square Samples for each type of glass.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

   1. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.

E. Qualification Data: For installers.

F. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

G. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance..

B. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass, laminated glass and insulating glass.

C. Source Limitations for Glass Sputter-Coated with Solar-Control Low-E Coatings: Where solar-control low-e coatings of a primary glass manufacturer that has established a certified fabricator program is specified, obtain sputter-coated solar-control low-e-coated glass in fabricated units from a manufacturer that is certified by coated-glass manufacturer.

D. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.

E. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.

1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.

F. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

G. Fire-Protection-Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing according to NFPA 257 or UL 9, including the hose-stream test, and shall comply with NFPA 80.

1. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from the hose-stream test, unless required by authorities having jurisdiction.

H. Safety Glazing Products: Comply with testing requirements in 16 CFR 120 and, for wired glass, ANSI Z97.1.

1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency] acceptable to authorities having jurisdiction.
2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

I. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA Laminated Division's "Laminated Glass Design Guide" and GANA's "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."

3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Sloped Glazing Guidelines."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."

J. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:

1. Insulating Glass Certification Council.

K. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup for types of windows indicated, in locations shown on Drawings.

L. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 JOB CONDITIONS:

A. Examine the framing and glazing channel surfaces, backing, removable stop design, and the conditions under which the glazing is to be performed, and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the glazing until unsatisfactory conditions have been corrected.

B. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other cuases.

1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

1.9 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to the User Agency and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: Ten years from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to the Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: Ten years from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

PART 2 - PRODUCTS

2.1 INSULATING-GLASS UNITS

A. Insulating-Glass Units for Vertical Glazing: 1 inch thick insulating glass consisting of two lites of 1/4 inch glass, low e coating on the No. 2 surface, 1/2 inch thick argon gas filled space, and mill finish air spacer. Provide one of the following or equal:

1. VE1-2M by Viracon.
   a. Visible Light Transmittance: 70 percent.
   b. Reflectance Visible Light: 11 percent.
   c. U Value (Winter): 0.25.
   d. Shading Coefficient: 0.43.
   e. Solar Heat Gain Coefficient: 0.37.
2. Solarban 60 by PPG Industries.
   a. Visible Light Transmittance: 70 percent.
   b. Reflectance Visible Light: 11 percent.
   c. U Value (Winter): 0.29.
   d. Shading Coefficient: 0.44.
   e. Solar Heat Gain Coefficient: 0.38.
3. SN-68 by Guardian Industries.
   a. Visible Light Transmittance: 68 percent.
   b. Reflectance Visible Light: 11 percent.
   c. U Value (Winter): 0.24 with argon gas.
   d. Shading Coefficient: 0.43.
   e. Solar Heat Gain Coefficient: 0.38.
4. Or equal.

B. Edge Seals: ASTM E 773, with aluminum spacers and silicone sealant for glass spacer seals.

C. Sealants: Approved by glass manufacturer, grey color as approved by the Architect.

D. Matching: To the greatest extent practical, glass on the exterior of the building shall match. Coordinate with mock-ups and specified requirements.

2.2 GLASS PRODUCTS

A. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interpane air space, and complying with ASTM E2190 and with requirements specified in this Section.

1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites

and to comply with glass design requirements specified in Part 1 “Performance Requirements” paragraph.

2. Provide Kind FT (fully tempered) glass lites where safety glass is indicated.
3. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit’s edge.
4. Sealing System: Dual seal, with primary and secondary sealants as follows:

    a. Manufacturer’s Standard Sealants. Butyl primary and silicone secondary sealants. Secondary sealant shall cover entire spacer bar at IGU perimeter.

5. Spacer Specifications: Manufacturer’s standard spacer material. Spacer corners shall be bent, soldered, or welded. Keyed spacer corners will not be accepted. Spacer may have a mid-span spacer key located at the midpoint of the insulating glass unit head. Where a mid-span spacer key is used, the key must be fully embedded (all sides) in butyl sealant.

2.3 GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Verify glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, interlayer of laminated glass, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Designer from manufacturer's full range.
4. Adhesives and sealants that are used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

    a. Structural Glazing Adhesives: 100 g/L.
    b. Architectural Sealants: 250 g/L.

B. Elastomeric Glazing Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Single-Component Neutral- and Basic-Curing Silicone Glazing Sealants: For 100/50% movement, typically at exterior locations, as follows:

    a. Dow Corning Corporation; 790.
    b. GE Silicones; SilPruf LM SCS2700.
    c. Tremco Inc.; Spectrem 1.
    d. Or equal.

C. Glazing Sealants for Fire-Resistive Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.

2.4 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for project conditions.

1. Manufacturer: Tremco 440 Tape, preformed butyl type or Tremco Polyshim II Vision Strip, preshimmed butyl type or equal by CR Laurence or 3M or approved equal.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:

1. Type 1, for glazing applications in which tape acts as the primary sealant.
2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

2.6 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with outdoor and indoor faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches as follows:

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each glazing unit is installed.

F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

3.5 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.6 CLEANING AND PROTECTION

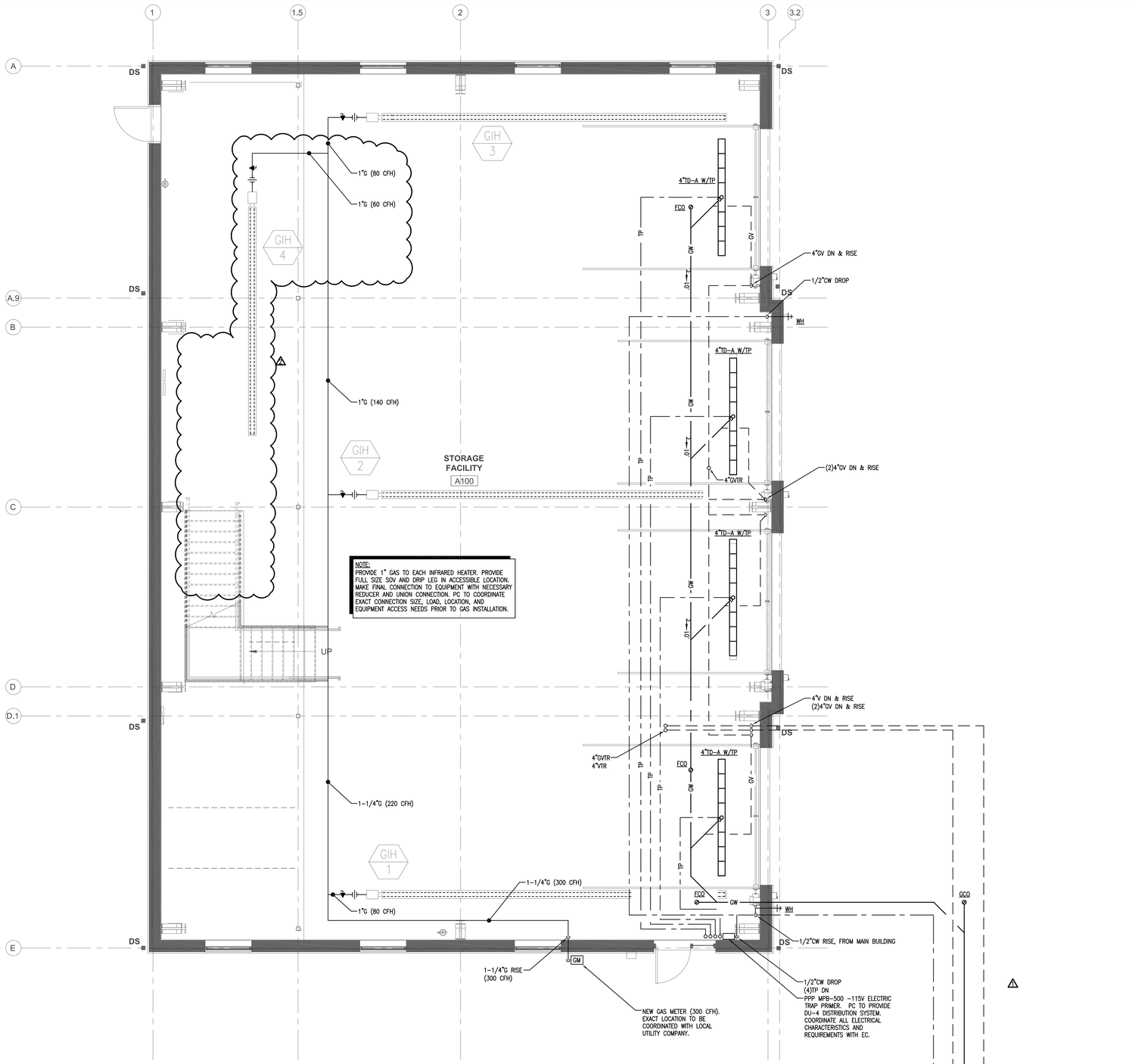
A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION



1 P200 PLUMBING PLAN
Scale: 1/4" = 1'-0"

Certification

Drawn by LW
Checked by SK

Revised on
1 ADDENDUM #2 06/28/24
2 ADDENDUM #3 07/11/24

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Drawing Status
100% CONSTRUCTION DOCUMENTS

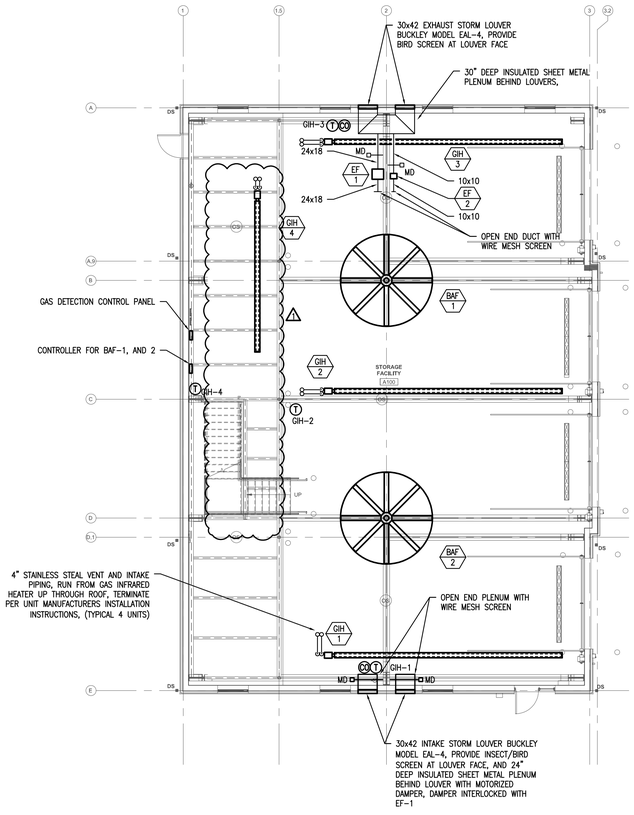
Issued On 5/24/2024

Sheet Contents
PLUMBING PLAN

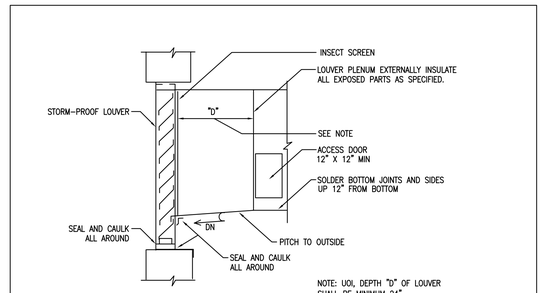
Project Number. 6790

Drawing No.
P200

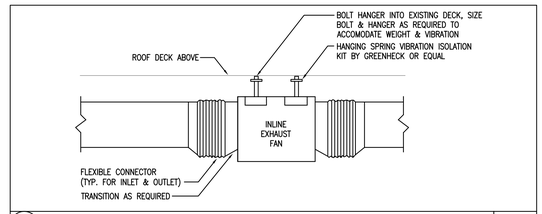
Sheet of



1 MECHANICAL PLAN
M100 Scale: 1/8" = 1'-0"



1 LOUVER CONNECTION DETAIL NTS



2 INLINE EXHAUST FAN DETAIL NTS

GAS FIRED INFRARED HEATER SCHEDULE

GENERAL		PERFORMANCE				ELECTRICAL			PHYSICAL					REMARKS			
TAG	LOCATION	MAX INPUT MBH	MIN INPUT MBH	MAX GAS PRESSURE	MAX GAS PRESSURE	AMPS	VOLTAGE	PHASE	TUBE QUANTITY	TUBE LENGTH (FT)	MOUNTING HEIGHT (FT)	SYSTEM WEIGHT (LBS)	MANUFACTURER MODEL	TYPE	RATINGS	FEATURES	INSTALL
GIH-1	SEE PLAN	80	65	14	7	1.8	120	1	1	30	14	120	REZNOR VPT-080	①	①	1	①
GIH-2	SEE PLAN	80	65	14	7	1.8	120	1	1	30	14	120	REZNOR VPT-080	①	①	1	①
GIH-3	SEE PLAN	80	65	14	7	1.8	120	1	1	30	14	120	REZNOR VPT-080	①	①	1	①
GIH-4	SEE PLAN	60	45	14	5	1.8	120	1	1	20	10	100	REZNOR VPT-060	①	①	1	①②

① NATURAL GAS FIRED, PRESSURIZED LOW INTENSITY, 2 STAGE, STRAIGHT TUBE SYSTEM
① 65°F EAT
1 PROVIDE WALL MOUNTED THERMOSTAT
① UNIT MOUNTING HEIGHT SHALL BE VERIFIED WITH OWNER BEFORE INSTALLATION
② UNIT SHALL BE MOUNTED ABOVE MEZZANINE 55" ANGLED

FAN SCHEDULE

GENERAL			PERFORMANCE					ELECTRICAL				PHYSICAL		REMARKS			
TAG	LOCATION	SERVICE	CFM	ESP (IN WG)	RPM	BHP	SONES	WATTS	HP	VOLTAGE	PHASE	WEIGHT (LBS)	MANUFACTURER MODEL	TYPE	RATINGS	FEATURES	INSTALL
EF-1	MAINTENANCE GARAGE	MAINTENANCE GARAGE	3175	0.375	815	0.44	10.8	–	3/4	208	1	147	GREENHECK BSQ-180	①	①②	1 2	①②③
EF-2	MAINTENANCE GARAGE	MAINTENANCE GARAGE	400	0.375	1550	0.07	7.4	–	1/10	115	1	48	GREENHECK SQ-90	②	①②	1 3	①②④

① SQUARE CENTRIFUGAL IN-LINE FAN, BELT DRIVE
② SQUARE CENTRIFUGAL IN-LINE FAN, DIRECT DRIVE
① AIR PERFORMANCE CERTIFIED IN ACCORDANCE TO AMCA 211
② SOUND PERFORMANCE CERTIFIED IN ACCORDANCE TO AMCA 311
1 UNIT MOUNTED SPEED CONTROLLER
2 MOTOR COVER/BELT GUARD
3 DIRECT DRIVE MOTOR COVER
① SEE INLINE EXHAUST FAN DETAIL THIS SHEET
② INLET AND DISCHARGE FLEXIBLE CONNECTIONS
③ FAN CONTROLLED BY GAS DETECTION CONTROL PANEL
④ FAN SHALL RUN CONTINUALLY

DUCTWORK PLAN GENERAL NOTES

1. UOI, DUCTWORK SHALL BE MOUNTED AS HIGH AS POSSIBLE, EXCEPT THAT DUCTWORK HEIGHT SHALL BE ADJUSTED AS NECESSARY FOR THE PROPER INSTALLATION OF EQUIPMENT, PIPING, AND CONDUIT.
2. UOI, ACOUSTICAL LINING SHALL BE 1" THICK.
3. DUCTWORK DIMENSIONS INDICATED ARE INSIDE CLEAR DIMENSIONS.

BAF 1 / BAF 2

BIG ASS FAN
MODEL: BASIC 6
FAN DIAMETER: 12 FT
WEIGHT: 185 LBS
208 VOLT, 3 PHASE
8.1 AMPS
15 AMP MOCP
1.5 HP

BOTTOM OF FAN MOUNTING HEIGHT 16'-0"
PROVIDE WITH MANUFACTURERS CONTROLLER PANEL

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
	DUCTWORK (SINGLE LINE)
	DUCTWORK WITH ACOUSTICAL LINING (SINGLE LINE)
	MOTORIZED DAMPER (MD)
	AIR ENTERING OPENING
	AIR LEAVING OPENING
	UNDERCUT DOOR
CO	CO / NO2 SENSOR
T	THERMOSTAT

TAG LEGEND

EQUIPMENT (REQUIRING POWER)	EQUIPMENT DESIGNATION / NUMBER

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ATC	AUTOMATIC TEMPERATURE CONTROL
BCC	BRANCH CIRCUIT CONTROLLER
BHP	BREAK HORSEPOWER
BTUH	BTU/HOUR
CFM	CUBIC FEET PER MINUTE
DX	DIRECT EXPANSION
EDB	ENTERING AIR TEMPERATURE (DRY BULB)
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING AIR TEMPERATURE (WET BULB)
°F	DEGREES FAHRENHEIT
FT WG	FEET WATER GAUGE
MBH	THOUSANDS OF BTU / HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MOP	MAXIMUM OVERCURRENT PROTECTION
MD	MOTORIZED DAMPER
NTS	NOT TO SCALE
OA	OUTSIDE AIR
ODB	OUTSIDE DRY BULB
OWB	OUTSIDE WET BULB
PH	PHASE
RPM	REVOLUTIONS PER MINUTE
RPM	REVOLUTIONS PER MINUTE
SP	STATIC PRESSURE
TYP	TYPICAL

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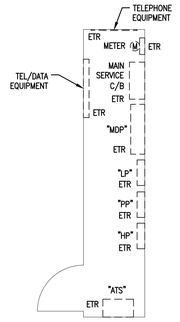
MECHANICAL PLAN

Project Number. 6790

Drawing No.
M100

Sheet of



2 ENLARGED ELECTRIC ROOM PLAN

ES100 Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. THE ELECTRICAL SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONDUIT, RACEWAYS AND PULL BOXES AS REQUIRED FOR THE GATE OPERATOR SYSTEMS IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. CONDUIT ROUTING SHOWN IS DIAGRAMMATIC ONLY. EXACT INSTALLATION LOCATION AND ROUTING OF CONDUITS SHALL BE DETERMINED IN THE FIELD WITH EXISTING AND PROPOSED SITE UTILITIES.

KEYED NOTES:

① PROVIDE (1) 3/4"C WITH BRANCH CIRCUIT WIRING FOR GATE OPERATOR. CONDUIT SHALL BE ROUTED THROUGH ATTIC SPACE, AND SHALL BE RUN EXPOSED ON THE EXTERIOR OF THE BUILDING. PROVIDE WEATHERPROOF JUNCTION BOX WHERE CONDUIT PENETRATES BUILDING EXTERIOR AND TRANSITION TO 3/4" SCHEDULE 40 PVC CONDUIT. RUN BELOW GRADE TO GATE OPERATOR. EXACT CONDUIT ROUTING SHALL BE DETERMINED IN THE FIELD.

② PROVIDE NEW 20A/1P CIRCUIT BREAKER IN EXISTING AVAILABLE SPACE TO SERVE GATE OPERATOR. EXISTING PANEL IS MANUFACTURED BY FPE. NEW CIRCUIT BREAKER SHALL BE COMPATIBLE WITH THE EXISTING EQUIPMENT AND MATCH THE EXISTING AIC RATING. REFER TO RISER DIAGRAM KEYED NOTE #5 ON DRAWING E300 FOR ADDITIONAL INFORMATION.

③ CONDUIT FOR FEEDER TO STORAGE BUILDING PANELBOARD SHALL BE ROUTED THROUGH ATTIC SPACE, AND SHALL BE RUN EXPOSED ON THE EXTERIOR OF THE BUILDING. PROVIDE WEATHERPROOF JUNCTION BOX WHERE CONDUIT PENETRATES BUILDING EXTERIOR AND TRANSITION TO SCHEDULE 40 PVC CONDUIT. RUN BELOW GRADE TO PANELBOARD LOCATION. EXACT CONDUIT ROUTING SHALL BE DETERMINED IN THE FIELD. REFER TO ELECTRICAL RISER DIAGRAM ON DRAWING E300 FOR ADDITIONAL INFORMATION.

④ PROVIDE (1) 3/4"C WITH PULLSTRING FROM STORAGE ROOM TO GATE-MOUNTED CARD READER. CONDUIT SHALL BE ROUTED THROUGH ATTIC SPACE, AND SHALL BE RUN EXPOSED ON THE EXTERIOR OF THE BUILDING. PROVIDE WEATHERPROOF JUNCTION BOX WHERE CONDUIT PENETRATES BUILDING EXTERIOR (NOT SHOWN ON PLANS) AND TRANSITION TO 3/4" SCHEDULE 40 PVC CONDUIT. RUN BELOW GRADE TO GATE. EXACT CONDUIT ROUTING SHALL BE DETERMINED IN THE FIELD.

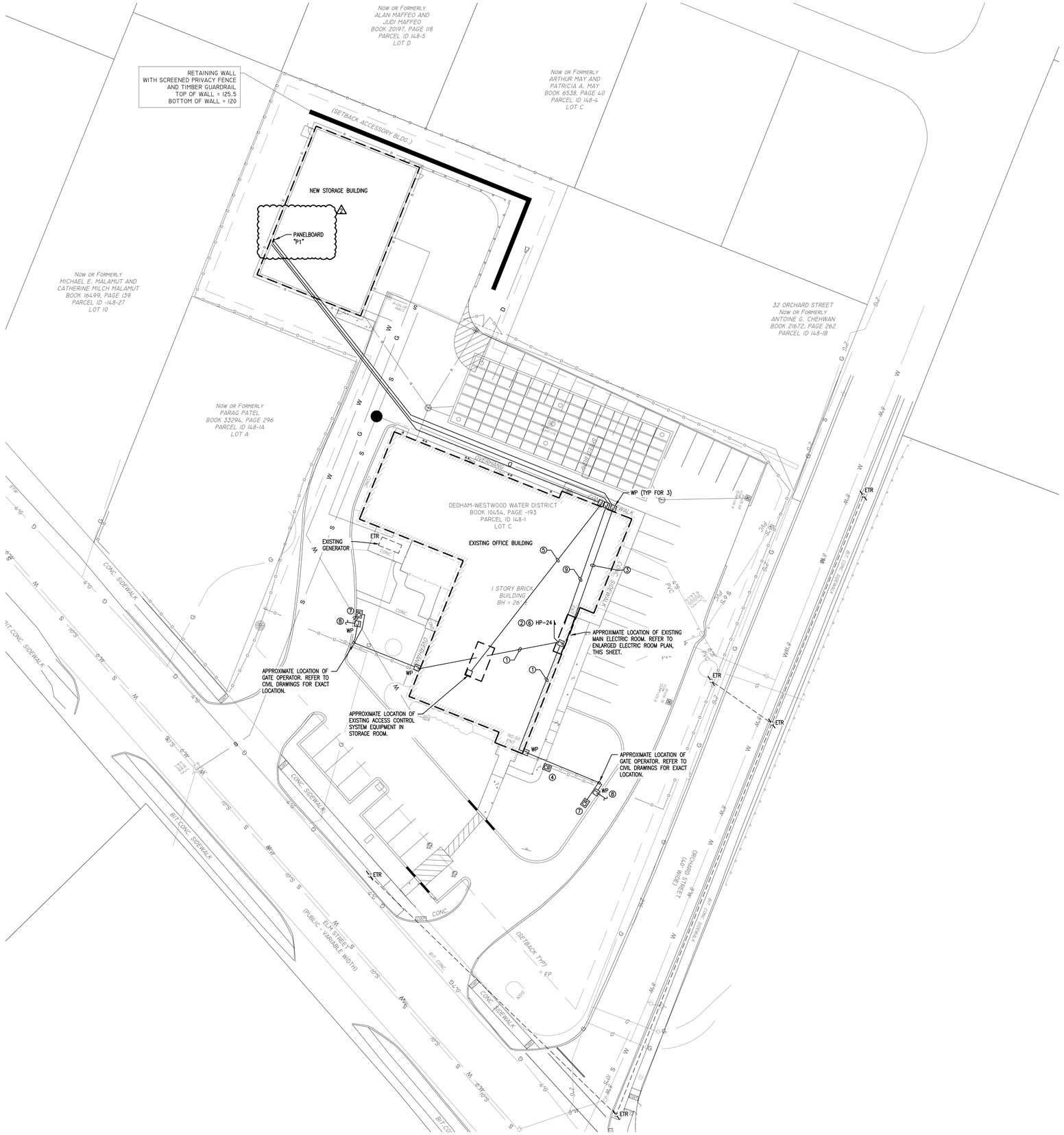
⑤ PROVIDE (1) 2"C WITH PULLSTRING FROM STORAGE ROOM TO NEW STORAGE BUILDING. LABEL EACH END OF THE CONDUIT WITH THE ORIGINATION AND TERMINATION LOCATION. CONDUIT SHALL BE ROUTED THROUGH ATTIC SPACE, AND SHALL BE RUN EXPOSED ON THE EXTERIOR OF THE BUILDING. PROVIDE WEATHERPROOF JUNCTION BOX WHERE CONDUIT PENETRATES BUILDING EXTERIOR AND TRANSITION TO 2" SCHEDULE 40 PVC CONDUIT. RUN BELOW GRADE TO STORAGE BUILDING AND STUB UP 12"AFF ADJACENT TO PANELBOARD "P1". EXACT CONDUIT ROUTING SHALL BE DETERMINED IN THE FIELD. CONDUIT SHALL BE RUN IN TRENCH WITH PANELBOARD "P1" FEEDER CONDUIT. MAINTAIN ALL REQUIRED SEPARATION DISTANCES BETWEEN CONDUITS.

⑥ PROVIDE SURGE PROTECTIVE DEVICE FOR GATE OPERATOR BRANCH CIRCUIT EQUAL TO DITEK #DTK-120SLR.

⑦ PROVIDE (1) 3/4" SCHEDULE 40 PVC CONDUIT WITH PULL STRING FROM GATE OPERATOR TO CARD READER LOCATION. COORDINATE EXACT LOCATION WITH CIVIL DRAWINGS.

⑧ PROVIDE (1) 3/4" SCHEDULE 40 PVC CONDUIT WITH PULL STRING FROM GATE OPERATOR TO LOOP DETECTOR. PROVIDE WEATHERPROOF/WATERTIGHT IN-GRADE JUNCTION BOX FOR SPLICING OF CABLES. COORDINATE EXACT LOCATION WITH CIVIL DRAWINGS.

⑨ PROVIDE (1) 2"C WITH PULLSTRING FROM TEL/DATA EQUIPMENT LOCATION IN MAIN ELECTRIC ROOM TO NEW STORAGE BUILDING. LABEL EACH END OF THE CONDUIT WITH THE ORIGINATION AND TERMINATION LOCATION. CONDUIT SHALL BE ROUTED THROUGH ATTIC SPACE, AND SHALL BE RUN EXPOSED ON THE EXTERIOR OF THE BUILDING. PROVIDE WEATHERPROOF JUNCTION BOX WHERE CONDUIT PENETRATES BUILDING EXTERIOR AND TRANSITION TO 2" SCHEDULE 40 PVC CONDUIT. RUN BELOW GRADE TO STORAGE BUILDING AND STUB UP 12"AFF ADJACENT TO PANELBOARD "P1". EXACT CONDUIT ROUTING SHALL BE DETERMINED IN THE FIELD. CONDUIT SHALL BE RUN IN TRENCH WITH PANELBOARD "P1" FEEDER CONDUIT. MAINTAIN ALL REQUIRED SEPARATION DISTANCES BETWEEN CONDUITS.



1 ELECTRICAL SITE PLAN

ES100 Scale: 1" = 20'-0"

Certification

Drawn by SD

Checked by DC

Revised on

1	ADDENDUM #2	06/28/24
2	ADDENDUM #3	07/11/24

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ELECTRICAL SITE PLAN

Project Number. 6790

Drawing No. ES100

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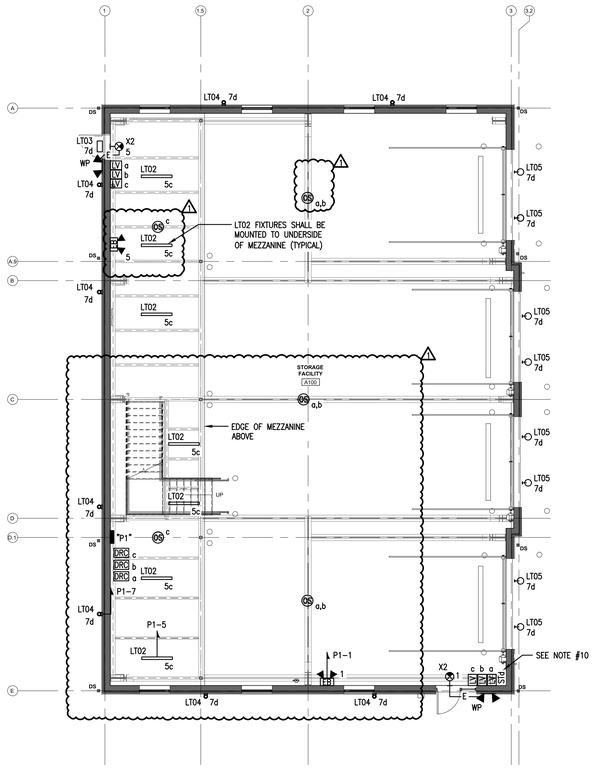
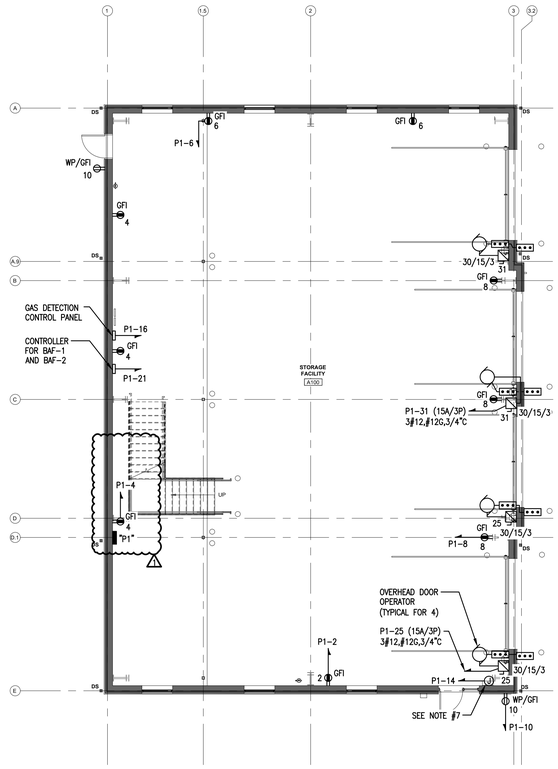


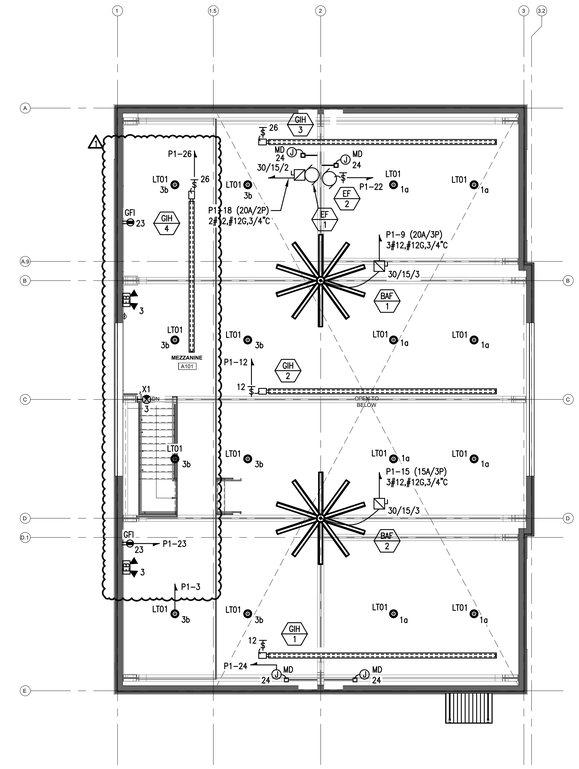
1 FIRST FLOOR LIGHTING PLAN

E200 Scale: 1/8" = 1'-0"



2 FIRST FLOOR POWER PLAN

E200 Scale: 1/8" = 1'-0"

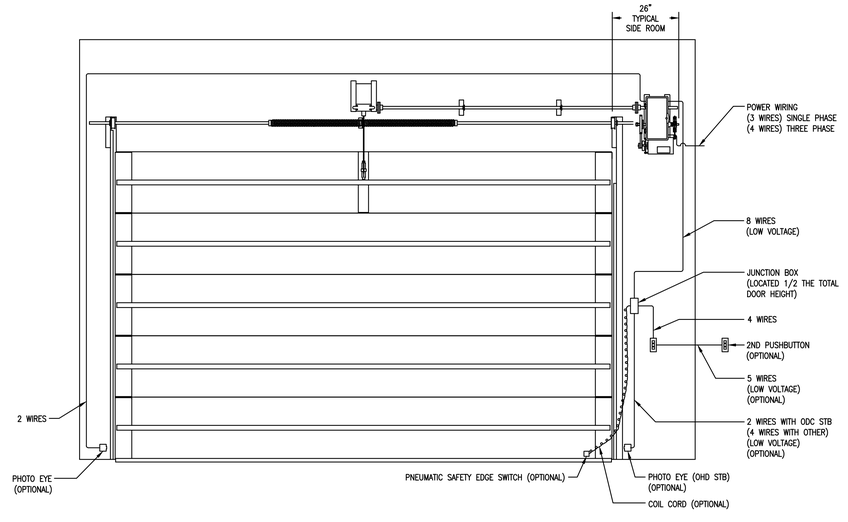


3 MEZZANINE LIGHTING & POWER PLAN

E200 Scale: 1/8" = 1'-0"

ELECTRICAL NOTES:

1. RECEPTACLES AND WALL SWITCHES LOCATED WITHIN THE GARAGE AND AT THE MEZZANINE SHALL BE SURFACE MOUNTED AND LOCATED AT 44" AFF UNLESS NOTED OTHERWISE. ALL RECEPTACLES SHALL BE GFCI TYPE. PROVIDE METAL OUTLET BOXES WITH STAINLESS STEEL FACEPLATES. WIRING SHALL BE PROVIDED IN EMT CONDUIT.
2. WALL AND CEILING MOUNTED ELECTRICAL DEVICES, FIXTURES, AND EQUIPMENT WITHIN THE BUILDING SHALL BE SURFACE MOUNTED. WIRING SHALL BE PROVIDED IN EMT CONDUIT. ALL OUTLET AND JUNCTION BOXES SHALL BE METAL WITH STAINLESS STEEL COVERS/FACEPLATES.
3. EXIT SIGNS AND EMERGENCY LIGHTING UNITS SHALL BE WIRED AHEAD OF LIGHTING CONTROLS.
4. ELECTRICAL SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL WIRING ASSOCIATED WITH OVERHEAD DOOR MOTORS/OPERATORS AND ALL ASSOCIATED ACCESSORIES. ALL WIRING SHALL BE PROVIDED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. CEILING FANS BAF-1 AND BAF-2 ARE EACH PROVIDED WITH A VFD BY THE MECHANICAL SUB-CONTRACTOR. THE ELECTRICAL SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND WIRING OF THE VFD'S AND PROVIDING CAT 5 WIRING FROM EACH VFD TO THE CONTROLLER. THE CONTROLLER SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL SUB-CONTRACTOR, WIRED BY THE ELECTRICAL SUB-CONTRACTOR. ALL WIRING SHALL BE PROVIDED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. GAS DETECTION SYSTEM CONTROL PANEL AND SENSORS SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL SUB-CONTRACTOR, WIRED BY THE ELECTRICAL SUB-CONTRACTOR. ALL WIRING SHALL BE PROVIDED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
7. PROVIDE CONNECTION TO ELECTRONIC TRAP PRIMER. COORDINATE EXACT REQUIREMENTS AND LOCATION WITH PLUMBING CONTRACTOR.
8. CONCRETE STRUCTURAL STEM WALL AT PERIMETER OF BUILDING EXTENDS TO 48" AFF. PROVIDE SUPPORT FRAME WITH PLYWOOD BACKBOARD AS REQUIRED FOR INSTALLATION OF PANELBOARD "P1".
9. LIGHTING CONTROL OCCUPANCY SENSORS SHALL BE MOUNTED TO BOTTOM OF STRUCTURAL STEEL.
10. PROVIDE ASTRONOMIC TIMER SWITCH FOR CONTROL OF EXTERIOR LIGHTING. COORDINATE EXACT LOCATION IN THE FIELD. PROVIDE LABEL ON SWITCH FACEPLATE INDICATING "EXTERIOR LIGHTS".



4 TYPICAL OVERHEAD DOOR WIRING DIAGRAM

E200 Scale: NOT TO SCALE

TYPICAL OVERHEAD DOOR WIRING DIAGRAM NOTES:

1. DETAIL SHOWN FOR GENERAL INFORMATION ONLY. OVERHEAD DOOR OPERATOR AND CONTROLS SHALL BE PROVIDED PER MANUFACTURER'S SPECIFICATIONS AND INSTALLATION INSTRUCTIONS.

Certification

Drawn by SD

Checked by DC

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ADDENDUM #3 07/11/24

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ELECTRICAL LIGHTING AND POWER PLANS

Project Number. 6790

Drawing No. E200

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