

SECTION 00 91 02

ADDENDUM 002

DATE: November 5, 2024

RE: Public Works - Administration Building
City of Sherwood
Sherwood, Arkansas

Architect Engineer Project No. 2023-249_10

FROM: CROMWELL ARCHITECT ENGINEERS, INC.
1300 East 6th Street
Little Rock, Arkansas 72202

TO: BIDDERS OF RECORD

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated September 23, 2024, as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

Each item in Contract Documents complements each of the other Contract Documents. No sheet, section, or document is to be followed without referring to all sheets, sections, and parts of the Contract Documents.

This Addendum consists of the following Documents and Revisions.

CHANGES TO PROCUREMENT AND CONTRACTING REQUIREMENTS:

- 1: Replace Section 00 01 10 - Table of Contents with revised Section issued with this Addendum.
- 2: Insert (this) Section 00 91 02 - Addendum 002 issued with this Addendum.

CHANGES TO SPECIFICATIONS:

- 3: Replace Section 08 14 16 – Flush Wood Doors with revised Section issued with this Addendum.
- 4: Replace Section 08 43 13 – Aluminum-Framed Storefronts with revised Section issued with this Addendum.
- 5: Replace Section 08 71 00 - Door Hardware with revised Section issued with this Addendum.
- 6: Replace Door Hardware Sets Attachment with revised issued with this Addendum.
- 7: Replace Section 08 80 00 – Glazing with revised Section issued with this Addendum.
- 8: Replace Section 23 74 13 – Packaged Outdoor Central-Station Air-Handling Units with revised Section issued with this Addendum.

CHANGES TO DRAWINGS:

9: Insert the attached revised and/or new Drawings issued with this Addendum dated with original issue date:

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S-102-A	ROOFING FRAMING PLAN	09/23/2023	1
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A-102R-A	FIRST FLOOR REFLECTED CEILING PLAN	09/23/2023	1
A-201-A	EXTERIOR ELEVATIONS	09/23/2023	1
A-202-A	EXTERIOR ELEVATIONS	09/23/2023	1
A-301-A	SECTIONS	09/23/2023	1
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SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush configuration; fire-rated, non-rated, and acoustical.

1.02 RELATED REQUIREMENTS

- A. Section 08 12 13 - Hollow Metal Frames.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.

1.03 REFERENCE STANDARDS

- A. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- B. ASTM E413 - Classification for Rating Sound Insulation; 2016.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 4.0; 2021.
- E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.
- F. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- G. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit three samples of door veneer, 8 by 10 inches in size illustrating wood grain, stain color, and sheen. Samples should reflect typical range of color and grain to be expected in finished Work
- E. Test Reports: Show compliance with specified requirements for the following:
 - 1. Sound-retardant doors and frames; sealed panel tests are not acceptable.
- F. Manufacturer's Installation Instructions: Indicate special installation instructions.
- G. Specimen warranty.
- H. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.

- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 - 1. Haley Brothers: www.haleybros.com.
 - 2. Masonite Architectural: www.architectural.masonite.com.
 - 3. Oregon Door: www.oregondoor.com.
 - 4. VT Industries, Inc: www.vtindustries.com.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

- A. Doors: See drawings for locations and additional requirements.
 - 1. Quality Standard: Custom Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated. Veneer thickness shall not be less 1/50 inch.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at each location.
 - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
 - 3. Smoke and Draft Control Doors (Indicated as "S" on Drawings): In addition to required fire rating, provide door assemblies tested in accordance with UL 1784 with maximum air leakage of 3.0 cfm per sq ft of door opening at 0.10 inch wg pressure at both ambient and elevated temperatures for "S" label; if necessary, provide additional gasketing or edge sealing.
 - 4. Sound Retardant Doors: Minimum STC as indicated on drawings, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
 - 5. Wood veneer facing with factory transparent finish.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
- C. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating specified; plies and faces as indicated above.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: ~~White Birch, Maple~~ veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face; unless otherwise indicated.
 - 1. Vertical Edges: Same species as face veneer.

2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 1. Provide solid blocks at lock edge for hardware reinforcement.
 2. Provide solid blocking for other throughbolted hardware.
- C. Fit door edge trim to edge of stiles after applying veneer facing.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

- A. Factory finish doors in accordance with approved sample, as indicated on drawings.
- B. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

- A. Hollow Metal Door Frames: See Section 08 12 13.
- B. Glazing: See Section 08 80 00.
- C. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
- D. Astragals for Non-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge.
- E. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 1. Install fire-rated doors in accordance with NFPA 80 requirements.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Coordinate installation of glazing.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION

SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Door hardware.

1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Steel Framing: Steel attachment members.
- B. Section 05 50 00 - Metal Fabrications: Steel attachment devices.
- C. Section 07 84 00 - Firestopping: Firestop at system junction with structure.
- D. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.
- ~~E. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.~~
- ~~E.~~ F. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

- A. AAMA 501.4 - Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts; 2018.
- B. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- C. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
- D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).
- E. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2017a.
- F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.
- G. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- J. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2018, with Editorial Revision.
- K. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 PERFORMANCE REQUIREMENTS

- A. General Performance:

1. Product to comply with the specified performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction, as determined by testing of aluminum storefront systems representing those indicated for this project.
2. Aluminum storefront systems shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, plans, elevations, sections, details, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples 12 inches in size illustrating finished aluminum surface, glass, glazing materials.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- I. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components 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. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- D. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Kawneer North America: www.kawneer.com.
- B. Other Acceptable - Aluminum-Framed Storefronts Manufacturers:
 - 1. EFCO Corporation: www.efcocorp.com.
 - 2. Oldcastle BuildingEnvelope: www.oldcastlebe.com.
 - 3. YKK AP America Inc.: www.ykkap.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices. Including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
 - 1. Product: Kawneer; Trifab VersaGlaze 451 Non-Thermal / 451T Thermal Framing System.
 - 2. Glazing Position: Centered (front to back).
 - 3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
 - 4. Front, center, back, multi-plane, structural silicone or weatherseal.
 - 5. Screw spline.
 - 6. Finish Color: As indicated on drawings.
 - 7. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 8. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 - 9. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 10. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 - 11. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 - 12. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
- B. Performance Requirements
 - 1. Wind Load: Static air design load of 35 psf shall be applied in the positive and negative direction in accordance with ASTM E330. There shall be no deflection in excess of L/175 of the span of any framing member. Structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 - 2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf as defined in AAMA 501.
 - 3. Air Infiltration: Air leakage rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.2 psf with interior seal, or, rate shall not exceed 0.06 cfm/ft² at a static air

- pressure differential of 1.6 psf without interior seal, when tested in accordance with ASTM E 283.
4. System Internal Drainage: Drain to the exterior by means of a weep drainage network using subsill, any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 6. Uniform Load: A static air design load of 35 psf shall be applied in the positive and negative direction in accordance with ASTM E 330.
 - a. There shall be no deflection in excess of L/175 of the span of any framing member.
 - b. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
 7. Seismic:
 - a. When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 x the story height and ultimate displacement (inelastic) of 1.5 x the design displacement.
 8. Thermal Movements:
 - a. Allow for thermal movements resulting from the following:
 - 1) 0°F (-18 C) to 180°F (82 C) maximum change (range) in ambient and surface temperatures
 - 2) 75°F (24 C) test interior ambient air temperature
 - b. Test performance shows no buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum 3 cycles.

2.03 COMPONENTS

- A. Aluminum Framing System: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Thermal Barrier: Thermal break with dual nominal 1/4 inch (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - a. Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
 2. Framing members for interior applications need not be thermally broken.
- B. Glazing System: See Section 08 80 00.
 1. For Exterior Framing: Type Low-e.
 2. For Interior Framing: Type tempered.
 3. Glazing Gaskets:
 - a. Manufacturer's standard compression types.
 - b. Replaceable, extruded EPDM rubber.
 4. Spacers and Setting Blocks:
 - a. Manufacturer's standard elastomeric type.
 5. Bond-Breaker Tape:
 - a. Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
 6. Glazing Sealants: For structural-sealant-glazed systems as recommended by manufacturer for joint type, and as follows:
 - a. Structural Sealant per ASTM C1184:
 - 1) Single-component neutral-curing silicone formulation that is compatible with the system components with which it comes in contact.

- 2) Specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in the aluminum-framed systems indicated.
- 3) Color: Black
- b. Weatherseal Sealant: ASTM C920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O.
 - 1) Single-component neutral-curing formulation that is compatible with the structural sealant and other system components with which it comes in contact
 - 2) Recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
 - 3) Color: Matching structural sealant.
- C. Entrance Swing Doors: Glazed aluminum.
 1. Door stile and rail face dimensions:
 - a. Medium Stile: 3-1/2 inch vertical face dimension, 1-3/4 inch depth, 6-1/2 inch bottom rail, high traffic applications.
 2. Major portions of the door members to be 0.125 inch (3.2) nominal in thickness and glazing molding to be 0.05 inch (1.3) thick.
 3. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
 4. Provide adjustable glass jacks to help center the glass in the door opening.
 5. Entrance System Fabrication:
 - a. Door corner construction shall consist of mechanical clip fastening, SIGMA 1-1/8 inch long fillet welds along top and bottom of rail extrusion at stile and rail intersection, and deep penetration plug weld at all four corners of door.
 - 1) Must be full penetration plug weld to leg of clip, 1-1/8-inch long fillet welds along top and bottom or rails at vertical stile intersection. No tie-rod construction of any type or partial design allowed. Meeting rail to still joint fillet weld "only" is not acceptable.
 - 2) Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable chord.
 6. Entrance Performance Requirements:
 - a. Structural: Corner strength shall be tested per dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner integrity.
 7. Finish: Same as storefront.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M) 6063-T6 alloy and temper; not less than 0.070 inch (1.8 mm) wall thickness at any location for the main frame.
- B. Fasteners: Stainless steel.
- C. Glazing Accessories: As specified in Section 088000.

2.05 FINISHES

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
- B. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch.

2.06 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: Storefront manufacturer's standard type to suit application.

1. Finish on Hand-Contacted Items: Polished stainless steel.
2. For each door, include butt hinges, pivots, push handle, pull handle, exit device, narrow stile handle latch, and closer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Comply with drawings and manufacturer's written instructions for installing aluminum-framed storefront system, accessories, and other components
- 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, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Set sill members in bed of sealant or with gaskets, as indicated, for weather-tight construction.
- G. Install aluminum-framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within aluminum-framed storefront system to the exterior.
- H. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
- I. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- J. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- K. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- L. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- M. Set thresholds in bed of sealant and secure.
- N. Install hardware using templates provided.
- O. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

- A. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
- B. Field Tests:
 1. Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured.

2. Tests that do not meet the specified performance requirements and units that have deficiencies shall be corrected as part of the contract amount.
3. Testing shall be performed per AAMA 501.2 Hose Test using proper water pressure and nozzle per test standard.

3.05 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.06 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Clean glass immediately after installation.
 1. Comply with glass manufacturer's written recommendations for final cleaning and maintenance.
 2. Remove non-permanent labels and clean surfaces.
- C. Clean aluminum surfaces.
- D. Avoid damaging protective coatings and finishes.
- E. Remove excess sealants, glazing materials, dirt, and other substances.
- F. Repair or replace damaged installed products.
- G. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.
- H. Remove construction debris from project site and legally dispose of debris.
- I. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

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SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes commercial door hardware for the following:
1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
1. Mechanical door hardware.
 2. Electromechanical door hardware.
 3. Cylinders specified for doors in other sections.
- C. Related Sections:
1. Division 08 Section "Hollow Metal Doors and Frames".
 2. Division 08 Section "Flush Wood Doors".
 3. Division 08 Section "Sound Control Wood Door Assemblies".
 4. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 2. ICC/IBC - International Building Code.
 3. NFPA 70 - National Electrical Code.
 4. NFPA 80 - Fire Doors and Windows.
 5. NFPA 101 - Life Safety Code.
 6. NFPA 105 - Installation of Smoke Door Assemblies.
 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
1. ANSI/BHMA Certified Product Standards - A156 Series.
 2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
 3. ANSI/UL 294 - Access Control System Units.
 4. UL 305 - Panic Hardware.
 5. ANSI/UL 437- Key Locks.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3.

- Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:
1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.
 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.04 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.
- B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

1.05 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.07 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.08 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 PRODUCTS

2.01 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following:

- a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for ~~the~~ all out-swinging lockable doors.
5. Manufacturers:
 - a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.02 CONTINUOUS HINGES

- A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
 1. Manufacturers:
 - a. Pemko (PE).

2.03 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Continuous Geared Transfer Hinges: Provide electrified transfer continuous geared hinges with a removable service panel cutout accessible without de-mounting door from the frame. Furnish with Molex™ standardized plug connectors with sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
 1. Manufacturers:
 - a. Pemko (PE) - SER-QC (# wires) Option.
- B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
 1. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
 - b. McKinney (MK) - Connector Hand Tool: QC-R003.
 2. Manufacturers:
 - a. McKinney (MK) - QC-C Series.

2.04 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
 5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
 6. Manufacturers:

- a. Rockwood (RO).

2.05 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- Manufacturers:
 - Corbin Russwin Hardware (RU).
- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
- Threaded mortise cylinders with rings and cams to suit hardware application.
 - Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
 - Tubular deadlocks and other auxiliary locks.
 - Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - Keyway: Manufacturer's Standard.
- C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.
- D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents.
- Patented key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
 - Manufacturers:
 - ~~Corbin Russwin (RU) - Access 3 AP.~~
 - ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - Keymark.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
- Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 - Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - New System: Key locks to a new key system as directed by the Owner.
- F. Key Quantity: Provide the following minimum number of keys:
- Change Keys per Cylinder: Three (3).
 - Master Keys (per Master Key Level/Group): Five (5).
 - ~~Construction Keys (where required): Ten (10).~~
- ~~G. Construction Keying: Provide temporary keyed construction cores.~~
- ~~H. Key Registration List (Bitting List):~~
- ~~Provide keying transcript list to Owner's representative in the proper format for importing into key control software.~~
 - ~~Provide transcript list in writing or electronic file as directed by the Owner.~~

2.06 KEY CONTROL

- ~~A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.~~
- ~~Manufacturers:~~
 - ~~Lund Equipment (LU).~~
 - ~~MMF Industries (MM).~~

~~e. Telkee (TK).~~

~~2.07 MORTISE LOCKS AND LATCHING DEVICES~~

~~A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.~~

~~1. Manufacturers:~~

~~a. Corbin Russwin Hardware (RU) ML2000 Series.~~

2.08 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.0907 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.
1. Provide exit devices with functions and features as follows:
 - a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
 - b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
 - ~~c. No catch points: addition of applied deflectors or other added components are not allowed.~~
 - ~~d. No visible plastic.~~
 - ~~e. Heavy duty end caps with flush and overlapping options made of stainless steel, brass, or bronze with architectural finishes.~~
 - ~~f. Constructed of all stainless steel.~~
 - ~~g. Stainless steel pullman type latch with deadlock feature.~~
 - ~~h. Narrow or wide style exterior trim as specified in the hardware sets.~~
 - ~~i. Center case adjustability on concealed vertical rod exit devices; single operation with hex key individually adjusts top or bottom latches. No retainer screws or clips required to maintain adjustment.~~
 - ~~jd. Ten-year limited warranty for mechanical features.~~
 2. Electromechanical exit devices shall have the following functions and features:
 - a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
 - b. Wire routing for all non-access control electromechanical functions and EcoFlex trim to be contained within the carrier of the device eliminating the need for cavities in doors to be drilled. Include a protective film so that wires don't get damaged if the rail needs to be removed.
 - c. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
 - d. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
 - e. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.

C. Conventional Push Rail Exit Devices (Commercial Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

3. Manufacturers:

- a. Corbin Russwin Hardware (RU) - PED4000 / PED5000 ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 6000 Series.

2.10-08 SURFACE DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use.

- Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (~~Large Body Cast Iron Commercial Duty~~): ANSI/BHMA A156.156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, ~~heavy-duty institutional grade~~ door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck ~~and separate non-critical valves for~~ closing sweep, and latch speed control valves. Provide non-handed units standard.
1. Manufacturers:
- ~~1. Manufacturers:~~
- a. ~~Corbin Russwin Hardware (RU) - DC8000~~ ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 5800 Series.
 - b. ~~Norton Rixson (NO) - 9500 Series.~~
 - c. ~~Sargent Manufacturing (SA) - 281 Series.~~
- ~~C. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted closers with door stop mechanism to absorb dead stop shock on arm and top hinge. Hold open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.~~
- ~~1. Manufacturers:~~
- a. ~~Corbin Russwin Hardware (RU) - Unitrol Series.~~
 - b. ~~Norton Rixson (NO) - Unitrol Series.~~

2.1409 ARCHITECTURAL TRIM

- A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
 4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
 6. Manufacturers:
 - a. Rockwood (RO).

2.1210 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Manufacturers:
 - a. Rockwood (RO).

2.4311 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko (PE).

2.4412 ELECTRONIC ACCESSORIES

- A. Intelligent Switching Power Supplies: Provide power supplies with single, dual or multi-voltage configurations at 12 and/or 24VDC. Power Supply shall have battery backup function with an integrated battery charging circuit. The power supply shall have a standard, integrated Fire Alarm Interface (FAI). The power supply shall provide capability for secondary voltage, power distribution, direct lock control and network monitoring through add on modules. The power supply shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs. Network modules shall provide remote monitoring functions such as status reporting, fault reporting and information logging.
 - 1. Manufacturers:
 - a. Securitron (SU) - AQL Series.

2.4513 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.4614 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.03 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.04 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to

operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.05 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.06 DOOR HARDWARE SETS

- A. Door Hardware Sets follow this section.

END OF SECTION

DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
- ~~3. YA - ASSA ABLOY ACCENTRA~~ ~~RU - Corbin Russwin~~
4. ~~RU - Corbin Russwin~~ ~~RO - Rockwood~~
5. ~~NO - Norton~~ ~~RO - Rockwood~~
6. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 101

-				
2	Continuous Hinge	BSPFM(Per Dr Hgt) SLI or F-HD1		PE
2	Concealed Vert Rod Exit	PED4850T-P13	BSP	RU
2	Locking Trim	PED355-AP	BSP	RU
2	Surface Closer	UNI9500	BSP	NO
-				

~~Notes: Threshold and weatherstrip~~ 1. All Hardware by the ~~aluminum door supplier~~ Storefront Manufacturer.

Set: 2.0

Doors: 122A, 122B

1. All Hardware by the Storefront Manufacturer.

4	Continuous Hinge	BSPFM(Per Dr Hgt) SLI or F- HD1 SER		PE
4	Rim Exit Device	PED4245 MELR N945PT M92 AP	BSP	RU
4	Surface Closer	UNI9500	BSP	NO
4	ElectroLynx Harness	QC-C*** As Req'd		MK
4	ElectroLynx Harness	QC-C***P Per Door Size		MK
4	Power Supply	AQL as Req'd		SU

Notes: Exit device with electric latch retraction for access control. Credential reader wiring of the door position switch and request to exit by security contractor. Door is normally closed, latched and secured. Valid credential for ingress, free egress at all times. Co-ordinate with security and electrical. Threshold and weatherstrip by the aluminum door supplier.

Set: 3.0

Doors: 101A

1	Continuous Hinge	BSPFM(Per Dr Hgt) SLI or F- HD1 <u>BSPFM(Per Dr Hgt) SLI or F-HD1</u>		PE
1	Continuous Hinge	BSPFM(Per Dr Hgt) SLI or F-HD1 SER <u>BSPFM(Per Dr Hgt) SLI or F-HD1 SER</u>		PE
1	Concealed Vert Rod Exit, <u>Exit Only</u>	PED4850T P13 <u>6220 EO</u>	BSP	<u>RU YA</u>
1	Concealed Vert Rod Exit, <u>Classroom</u>	PED4850T MELR P13 M92 <u>6220 503F K840</u>	BSP	<u>RU YA</u>
2	Locking Trim <u>Pull</u>	PED355-APRM201 Mtg-Type 1XHD	BSP	<u>RU RO</u>
2	Surface Closer	UNI9500 <u>5831</u>	BSP	<u>NO YA</u>
1	ElectroLynx Harness	QC-C*** As Req'd		MK
1	ElectroLynx Harness	QC-C***P Per Door Size		MK
1	Power Supply	AQL as Req'd		SU

Notes: Exit device with electric latch retraction on one leaf for access control. Credential reader wiring of the door position switch and request to exit by security contractor. Door is normally

closed, latched and secured. Valid credential for ingress, free egress at all times. Co-ordinate with security and electrical.

Set: 4.0

Doors: 120C

-			
4	Continuous Hinge	BSPFM(Per Dr Hgt) SLI or F- HD4	PE
4	Rim Exit Device, Exit Only	PED4201 EO	BSP RU
4	Surface Closer	UNI9500	BSP NO
-			

Notes: Threshold and weatherstrip by the aluminum door supplier.1. All Hardware by the Storefront Manufacturer.

Set: 5.0

Doors: 117

2 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Hinge, Full Mortise	TA2714 QC12 4-1/2" x 4-1/2"	US26D MK
1 Fail Secure Lock	ML20906-SEC NSA M92xM105-APAU 4791LN K800	626 RU YA
1 Surface Closer	95005801	689 NO YA
1 Wall Stop	409	US32D RO
1 ElectroLynx Harness	QC-C*** As Req'd	MK
1 ElectroLynx Harness	QC-C***P Per Door Size	MK
1 Power Supply	AQL as Req'd	SU

Notes: Electrified lock for access control. Credential reader, wiring of the door position switch and request to exit by security contractor. Door is normally closed, latched and secured. Valid credential for ingress, free egress at all times. Co-ordinate with security and electrical.

Set: 6.0

Doors: 119

3 Hinge, Full Mortise	TA2714 QC12 4-1/2" x 4-1/2"	US26D MK
1 Fail Secure Lock	ML20906-SEC NSA M92xM105-APAU 4791LN K800	626 RU YA
1 Surface Closer	UNI95005831	689 NO YA
1 Kick Plate	K1050 10" CSK BEV	US32D RO

3 Silencer	608-RKW	RO
1 ElectroLynx Harness	QC-C*** As Req'd	MK
1 ElectroLynx Harness	QC-C***P Per Door Size	MK
1 Power Supply	AQL as Req'd	SU

Notes: Electrified lock for access control. Credential reader, wiring of the door position switch and request to exit by security contractor. Door is normally closed, latched and secured. Valid credential for ingress, free egress at all times. Co-ordinate with security and electrical.

Set: 7.0

Doors: 105, 107

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Storeroom <u>or Closet</u> Lock	ML2057 NSA-APAU 4705LN K800	626 RU YA
1 Surface Closer	9500 5801	689 NO YA
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

Set: 8.0

Doors: 108

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Storeroom <u>or Closet</u> Lock	ML2057 NSA-APAU 4705LN K800	626 RU YA
1 Kick Plate	K1050 10" CSK BEV	US32D RO
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

Set: 9.0

Doors: 100, 102, 104, 113, 114, 116, 118

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 <u>Entrance</u> Entry Lock	ML2054 NSA-APAU 4707LN K800	626 RU YA
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO
1 Coat Hook	RM801	US26D RO

Set: 10.0

Doors: 120A, 120B

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Classroom Lock	ML2055 NSA <u>APAU 4708LN K800</u>	626 RU YA
1 Surface Closer	UNI95005831	689 NO YA
1 Kick Plate	K1050 10" CSK BEV	US32D RO
1 Gasketing	349GS319CS	PE
1 Automatic Door Bottom	STC4131CPK <u>STC4131CPK</u>	PE

Set: 11.0

Doors: 103

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Classroom Lock	ML2055 NSA <u>APAU 4708LN K800</u>	626 RU YA
1 Surface Closer	95005801	689 NO YA
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

Set: 12.0

Doors: 115

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Classroom Lock	ML2055 NSA <u>APAU 4708LN K800</u>	626 RU YA
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

Set: 13.0

Doors: 103A, 106

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Passage Latch	ML2010 NSA <u>AU 4701LN</u>	626 RU YA
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

Set: 14.0

Doors: 109, 112

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Privacy Lock	ML2030 NSA V21AU 4702LN	626 RU YA
1 Surface Closer	9500 5801	689 NO YA
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

Set: 15.0

Doors: 110, 111

3 Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D MK
1 Pull	RM301 Mtg-Type 1XHD	US32D RO
1 Push Plate	70E	US32D RO
1 Surface Closer	9500 5801	689 NO YA
1 Kick Plate	K1050 10" CSK BEV	US32D RO
1 Wall Stop	409	US32D RO
3 Silencer	608-RKW	RO

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

1.02 RELATED REQUIREMENTS

- A. Section 07 25 00 - Weather Barriers.
- B. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.
- C. Section 08 12 13 - Hollow Metal Frames: Glazed borrowed lites.
- D. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.
- E. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- F. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
- I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
- J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
- K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- L. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
- M. GANA (GM) - GANA Glazing Manual; 2008.
- N. GANA (SM) - GANA Sealant Manual; 2008.
- O. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2017.
- P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014, with Errata (2017).
- Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, indicate joint design, sealant contact width and depth dimensions, special application requirements, and applicable information on gaskets, spacers, setting blocks and any other accessories.
- D. Samples: Submit two samples 12 by 12 inch in size of glass units, showing coloration.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM) for glazing installation methods. Maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.07 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Glass Fabricators: Certified or accepted by approved Glass Manufacturer.
- B. Glass Manufacturers:
 - 1. AGC Glass North America, Inc: www.agcglass.com.
 - 2. Guardian Glass, LLC: www.guardianglass.com.
 - 3. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: Calculated in accordance with ASCE 7.

2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7.
 4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 5. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
1. In conjunction with weather barrier related materials described in other sections, as follows:
 - a. Water-Resistive Barriers: See Section 07 25 00.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
 2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048; where resistance to thermal stresses is indicated or required.
 3. Kind FT - Fully Tempered Type: Complies with ASTM C1048; where safety glass is indicated or required.
 4. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.
 5. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category II impact test requirements.
 2. Polyvinyl Butyral (PVB) Interlayer: 0.060 inch thick, minimum.
- C. Fire-Protection Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
1. IBC Fire Protection Rating: As indicated on drawings.
 2. Provide products listed by UL or Intertek Warnock Hersey.
 3. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.

2.04 INSULATING GLASS UNITS

- A. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 3. Metal-Edge Spacers: Aluminum, bent and soldered corners.
 4. Spacer Color: Black.
 5. Edge Seal:

- a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
- b. Color: Black.
6. Purge interpane space with dry air, hermetically sealed.

2.05 INSULATING GLASS UNITS - SCHEDULE

- A. Vision Glass: Type Low-E Tinted Insulating Glass - Light-gray, low-reflective glass outdoor appearance.
 1. Product: Solarban R60 (2) "Optigray" Fully Tempered, HT + Clear HT by Vitro Architectural Glass.
 - a. Insulating Unit Construction: 1/4 inch "Optigray" glass, Solarban R60 Solar Control (sputtered) on surface (2) + 1/2 inch air space + 1/4 inch Clear Float Glass.
 2. Product: SunGuard SuperNeutral SN68 (2) "Crystal Gray" Fully Tempered, HT + Clear HT by Guardian Glass.
 - a. Insulating Unit Construction: 1/4 inch "Crystal Gray" glass, SunGuard SuperNeutral SN 68 (sputtered) on surface (2) + 1/2 inch air space + 1/4 inch Clear Float Glass.
 3. Performance Values: Visible Light Transmission (VLT) 48-50 percent; SHGC 0.30-0.35; Light to Solar Gain (LSG) 1.43 - 1.64; Visible Light Reflectance – Exterior 8 percent, Interior 9-11 percent; Heat Transfer Coefficient U-Value Winter – 0.29.
 4. Manufacturer's Certified Fabricator only.
 5. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.06 GLAZING UNITS

- A. Monolithic Interior Vision Glazing:
 1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Annealed float glass.
 3. Tint: Clear.
 4. Thickness: 3/8 inch, nominal.
 5. Manufacturers:
 - a. Solarban R60 by Vitro Architectural Glass.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 GLAZING COMPOUNDS

- A. Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.
- B. Polyurethane Sealant: Single component, chemical curing, nonstaining, nonbleeding; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.
- C. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.08 ACCESSORIES

- A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option I. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color black.

- E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- E. Place glazing tape on free perimeter of glazing in same manner described above.
- F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- G. Carefully trim protruding tape with knife.

3.06 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Place setting blocks at 1/4 points and install glazing pane or unit.
- C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.
- D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.07 INSTALLATION - WET GLAZING METHOD (COMPOUND AND COMPOUND)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
- C. Locate and secure glazing pane using glazers' clips.
- D. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.08 INSTALLATION - WET/DRY GLAZING METHOD (PREFORMED TAPE AND SEALANT)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- C. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- D. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- E. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
- F. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch below sight lines.
 - 1. Place glazing tape on glazing pane of unit with tape flush with sight line.
- G. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
- H. Apply cap bead of sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.09 INSTALLATION - WET/DRY GLAZING METHOD (TAPE AND SEALANT)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
- E. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
- F. Fill gaps between pane and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- G. Carefully trim protruding tape with knife.

3.10 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.11 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

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SECTION 23 74 13

PACKAGED OUTDOOR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ground Mounted Packaged units.
- B. Unit controls.
- C. ~~Maintenance service.~~

1.02 RELATED REQUIREMENTS

- A. Section 23 05 48 - Vibration And Seismic Controls For HVAC Piping And Equipment.
- B. Section 26 05 83 - Wiring Connections: Installation and wiring of thermostats and other controls components; wiring from unit terminal strip to remote panel.

1.03 REFERENCE STANDARDS

- A. AHRI 270 - Sound Performance Rating of Outdoor Unitary Equipment; 2015, with Addendum.
- B. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks; 2020, with Errata and Amendments (2021).
- C. IEEE 802.11 - IEEE Standard for Information Technology--Telecommunications and Information Exchange between Systems - Local and Metropolitan Area Networks--Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications; 2020, with 2021 Amendments.
- D. Modbus (PS) - The Modbus Organization Communications Protocol; Latest Update.
- E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.
- D. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- E. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.
- F. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- G. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
- 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. Extra Filters: Two sets for each unit.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from physical damage by storing off site until roof mounting curbs are in place, ready for immediate installation of units.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

- A. General: Ground mounted units having gas burner and electric refrigeration.
- B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, heat recovery coil, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

2.02 FABRICATION

- A. Cabinet: Steel with baked enamel finish, including access panels with screwdriver operated flush cam type fasteners. Structural members shall be minimum 18 gauge, 0.0478 inch, with access doors or panels of minimum 20 gauge, 0.0359 inch.
- B. Heat Exchangers: Aluminized steel, of welded construction.

2.03 EVAPORATOR COIL

- A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.
- B. Provide capillary tubes or thermostatic expansion valves for units of 6 Tons of refrigeration capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 Tons of refrigeration cooling capacity and larger.

2.04 COMPRESSOR

- A. Provide noted compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and filter drier.

2.05 CONDENSER COIL

- A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.
- B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.
- C. Provide refrigerant pressure switches to cycle condenser fans.

2.06 MIXED AIR CASING

- A. Dampers: Provide remote controlled outside and return air dampers with damper operator and remote thermostat for adjusting outside air quantity.

2.07 OPERATING CONTROLS - SINGLE ZONE UNITS

- A. Electric solid state microcomputer based room thermostat, located as indicated in service area with remote sensor located as indicated.
- B. Room thermostat shall incorporate:
 1. Automatic switching from heating to cooling.
 2. Set-up for four separate temperatures per day.
 3. Instant override of set point for continuous or timed period from one hour to 31 days.
 4. Short cycle protection.
 5. Programming based on weekdays, Saturday and Sunday.
 6. Switch selection features including imperial or metric display, 12 or 24 hour clock, keyboard disable, remote sensor, fan on-auto.

- C. Room thermostat display shall include:
 - 1. Actual room temperature.
 - 2. Programmed temperature.
 - 3. System model indication: heating, cooling, auto, off, fan auto, fan on.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that ground is ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that proper power supply is available.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 90A.

3.03 SYSTEM STARTUP

- A. Prepare and start equipment. Adjust for proper operation.

3.04 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals for closeout submittals.

~~3.05 MAINTENANCE~~

- ~~A. Provide service and maintenance of packaged units for five years year from Date of Substantial Completion.~~
- ~~B. Provide routine maintenance service with a two month interval as maximum time period between calls.~~
- ~~C. Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.~~
- ~~D. After each service call, submit copy of service call work order or report that includes description of work performed.~~

END OF SECTION

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