PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide hollow metal doors, door frames and window frames required.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Use skilled workmen thoroughly trained and experienced and completely familiar with specified requirements and methods needed for proper performance of work of this Section.

B. Codes and Standards:
1. Manufacture labeled units in strict accordance with specifications and procedures of Underwriters' Laboratories, Inc. Labels must be affixed to rated assemblies.
2. In guarantee and Shop Drawings, apply and use definitions and nomenclature established in American National Standards Institute publication A 123.1 "Nomenclature for Steel Doors and Steel Door Frames."
3. Fire-Rated Units: **Affix metal plates to jamb side or top of door and/or frame stating the appropriate fire rating. Paper labels will not be accepted. Do not apply paint or stain over metal labels. Mask off the label before applying finish and remove masking after finish is dry.**

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Protection:
1. Deliver, store, and handle hollow metal units to prevent damage and deterioration.
2. Provide packaging of cardboard or containers, separators, banding, spreaders, and paper wrappings to completely protect hollow metal units during transportation and storage.
3. Store units upright, in protected dry area, at least one inch off ground and with at least 1/4" air space between individual pieces. Protect primed and hardware surfaces.

4. Protect installed work and materials of other trades.
5. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked units to promote air circulation.

B. Replacements: Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided finish items are equal in all respects to new work, otherwise, remove and replace damaged items as directed at Contractor's expense.

PART 2 - PRODUCTS

2.01 GENERAL

A. Fabricate hollow metal items rigid, neat in appearance, and free from defects, warp, or buckle.

B. Provide clean cut, straight and true molded members with well-formed and aligned miters.

C. Dress exposed weld joints smooth.

D. Door Clearances: Maximum 1/8" at jambs and heads, 1/8" at meeting edges of pairs of doors, and 3/4" at bottom from finished floorline.

E. Close top and bottom edges of exterior doors flush. Seal against water penetration with flush steel channel fillers.

2.02 ACCEPTABLE MANUFACTURERS

A. Provide hollow metal units by Amweld Building Products, Inc., The Ceco Corp., Curries Mfg. Co., Mesker Industries, Inc., Republic Builders Prod. Corp., Steelcraft, Trussbilt, Inc., or approved equal.

2.03 FACTORY PREPARATION

A. Prepare units to receive hardware scheduled in "Hardware" Section of these specifications and in accordance with ANSI Standards A 115-1 through A 115-17.

B. Cut, mortise, reinforce, drill, and tap units at factory, except drill and tap for surface applied hardware at job when hardware is applied.

C. Prepare door frames for rubber silencers to be provided with frames.

2.04 SHOP PRIME COAT FOR FIELD FINISHED DOORS AND FRAMES

A. Clean, treat, and prime exposed surfaces of hollow metal units, including galvanized surfaces.

B. Clean steel surfaces free of mill scale, rust, oil, grease, dirt, and foreign materials before applying paint.

C. Apply shop coat of rust-inhibiting prime paint of even consistency to provide uniformly finished surface ready to receive finish paint.

2.05 FLUSH TYPE DOORS

A. Form flush type hollow metal doors with outer sheets of cold rolled steel conforming to ASTM Designation A 1008. No exposed face seams
   1. Form exterior doors using minimum 16 gauge Galvanized steel.
   2. Form interior doors using minimum 18 gauge steel.

B. Core material at interior doors is to be either water-resistant honeycomb insulation core glued in place, rigid insulation core glued in place or rigid insulation core foamed in place. Core material at exterior doors is to be either rigid insulation core glued in place or rigid insulation core foamed in place.
   1. Honeycomb Insulation Core (Glued, Interior Only): Crushing strength of not less than 4,000 p.s.f., and with lamination to withstand not less than 1,500 p.s.f. surface shear.
   2. Rigid Insulation Core (Glued, Interior or Exterior): Polystyrene slab, density not less than 1.0 pounds per cubic foot.
   3. Rigid Insulation Core (Foamed-in-Place, Interior or Exterior): Nonburning type having compressive strength and shear strength of not less than 20 p.s.i., an insulation to steel bonding strength at least equal to the strength of the insulation, be dimensionally stable within plus or minus 5% volume after 24-hour exposure to temperatures ranging from minus 15E F. to 200E F., have no voids exceeding 1/2" in any direction, and have density of not less than 1.8 pounds per cubic foot.

C. Provide doors complete with glazed panels where required. Glass is specified in Section 08 8000

2.06 FIRE DOORS

A. At fire rated openings, furnish doors bearing Underwriters' Laboratories or Warnok-Hersey label for fire rating required. Furnish overlapping metal astragal on pairs of fire doors except where equipped with approved rim type exit hardware and provided with a removable mullion.

B. For 1-1/2 hour (B) and 1 hour (B) doors used in stairway enclosures the average temperature developed on the unexposed side shall not exceed 450 deg.F. at the end of 30 minutes of standard fire test exposure. The label attached to the door shall indicate compliance with this requirement.

2.07 WELDED DOOR FRAMES

A. Form pressed steel frames using cold rolled steel conforming to ASTM Designation A 1008.
   1. Form exterior frames using minimum 14 gauge Galvanized steel.
   2. Form interior frames using minimum 16 gauge steel.

B. Secure headers and jambs at corners by external welding of faces. Grind smooth to provide invisible joints.
   1. Knock-Down frames are not acceptable.

C. Provide frames with minimum of 3 anchors per jamb for adjoining wall construction and floor anchors for attachment at floor. Construct anchors using minimum 18 gauge steel.

D. For frames that are to receive concealed closers mounted in the head; provide a cover box to attach to the inside of the frame that will completely cover and protect the closer.

E. At fire rated openings, furnish frames bearing Underwriters' Laboratories or Warkok-Hersey label for fire rating required with anchors approved for type installation required.
   1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine areas and conditions for work of this Section. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install hollow metal units in strict accordance with approved Shop Drawings and manufacturer's recommendations.

B. Set frames accurately, plumbed, aligned, and securely anchored.

C. Install finish hardware in strict accordance with manufacturers' recommendations. Eliminate hinge-bound conditions, making items operate smoothly with secure locking and latching.

3.03 ADJUST AND CLEAN

A. Immediately after installation, sand smooth rusted and damaged prime coat. Apply compatible touch-up air-drying primer.

B. Check and adjust operating finish hardware items, leaving hollow metal units undamaged and in proper operating condition.

C. Excessive filing or grinding of strike plate will not be accepted. Filing and grinding not to exceed 1/8" in any direction.

END OF SECTION

PART 1 - GENERAL REQUIREMENTS

1.01 RELATED SECTIONS

A. Division 08 Plastic Laminate Doors

B. Division 08 Door Hardware

1.02 REFERENCES

A. AAMA 607.1 – Guide Specification and Inspection Methods for Clear Anodized finishes

B. AAMA 609 & 610 – Cleaning and Maintenance Guide for Architecturally Finished Aluminum

C. ASTM B221 – Standard Specification for Aluminum and Aluminum alloy Extruded Bars, Rods, Profiles and Tubes.

D. ANSI/SDI A250.4-2011 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors

E. NFPA-80 Standard for Fire Doors

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

C. Product Data: Manufacturer's data sheets to include:
1. Preparation instructions and recommendations.
2. Storage/handling requirements and recommendations.
3. Installation instructions.

D. Shop Drawings: Submit drawings for fabrication and installation of flush interior aluminum frames, to include:
1. Details jambs, headers, trims and connections
2. Details and identification of each frame type
3. Elevations
4. Location and installation requirements of door hardware and reinforcements.
5. Door Frame Schedule of openings and locations including fire rated frame requirements

E. Quality Assurance Certification: Submit manufacturer's certification that products have been constructed and tested

F. Color Samples: Two sets of color chips representing manufacturer's full range of available colors

G. Product Samples: T wo samples, minimum size 6 inches long, representing specified product and color

H. Certificates of Compliance: Submit product test report from Independent Laboratory indicating compliance with performance testing herein specified.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 years' experience in manufacturing similar systems.

B. Installer Qualifications: Minimum 2 years' experience installing similar systems and acceptable to the manufacturer.

C. Product Qualifications:
   1. Flush frames to be 6063 T-5 extruded aluminum to meet ASTM B 221 specifications
   2. Recycled content of aluminum to be a minimum of 50% postconsumer

1.05 WARRANTY

A. Provide manufacturer's written warranty against defects in materials and workmanship for a period of one year from date of substantial completion.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver frames in crates or cartons suitable for storage at the site. Do not bulk pack frames.
   1. Protect products from damage by covering and properly storing in a cool, dry area, elevated above ground level as near as possible to final location. Do not use non- vented plastic or canvas covers.
   2. Protect materials and finish from damage during handling and installation.

1.07 PROJECT CONDITIONS

A. Field measurements: Verify actual dimensions of Minimalist interior aluminum frame openings by field measurement prior to installation of frames. Have incorrect openings corrected prior to frame installation.

B. Work area must be completely enclosed and protected from the elements prior to Minimalist frame installation.

C. Maintain temperature, humidity, and ventilation conditions so as to not adversely affect door frames or packaging. Keep cartons dry.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide Minimalist aluminum door frames as manufactured by: Fry Reglet Corporation 1377 Stonefield Court Alpharetta, GA 30005 800-237-9773

2.02 DESIGN / PERFORMANCE REQUIREMENTS (STANDARD HINGES)

A. General: Fabricate Minimalist frames for scheduled openings providing extruded flanges for integration to adjoining drywall.
   1. Minimum Frame Extrusion Wall Thickness: 0.078 inch (1.98 mm).
   2. Construction: Extruded aluminum hinge jamb, strike jamb and header section factory mitered to install with hair-line seams.
   3. Provide continuous door silencer of thermoplastic vulcanizate (TPV) material
   4. Frame sections shall be extruded to include continuous, punched, taping flanges along each exposed section for application of tape, mud, primer and paint

B. DoorSizes: Minimalist aluminum frame capable of accepting standard 1-3/4 inch (44.5 mm) door thicknesses:
   1. Minimalist door frame throat size: 4 – 7/8 inches (123.83 mm).
   2. Reveal: 1/8” continuous

C. Test procedures and Performances: Provide independent lab test report based on *ANSI/SDI A250.4-2011 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors* indicating that frame has been tested and achieved a count of at least 35,000 cycles when subjected to a shutting force of 7 pounds per cycle, showing no visible cracking in abutting drywall finishing.

D. Hardware Installation: Provide flush mounting plates for field sizing to accommodate hardware locations as defined in the specifications and drawings. Reinforcements: Include integral hinge and strike reinforcements designed to position hinge and strike plates flush with face of frame.

2.03 DESIGN / PERFORMANCE REQUIREMENTS (STANDARD HINGES) – 20 Minute Fire Rated

A. General: Fabricate Minimalist frames for scheduled openings providing extruded flanges for integration to adjoining one-hour rated drywall.
   1. Minimum Frame Extrusion Wall Thickness: 0.078 inch (1.98 mm).
   2. Construction: Extruded aluminum hinge jamb, strike jamb and header section factory mitered to install with hair-line seams.
   3. Provide continuous door silencer of thermoplastic vulcanizate (TPV) material.
   4. Frame sections shall be extruded to include continuous, punched, taping flanges along each exposed section for application of tape, mud, primer and paint.

B. Hardware Installation: Provide flush mounting plates for field sizing to accommodate hardware locations as defined in the specifications and drawings. Reinforcements: Include integral hinge and strike reinforcements designed to position hinge and strike plates flush with face of frame.

2.04 MATERIALS

A. Extrusion Alloy: 6063 T5.

B. Finish: Primed for field paint.

C. Hardware: As specified in Division 08 Section “Door Hardware”, or factory installed

PART 3 – EXECUTION

3.01 EXAMINATION

A. Do not begin installation until rough opening sizes have been verified.

B. If rough openings sizes are not correct, notify Architect of incorrect dimensions and have corrected before proceeding.

C. Before beginning installation, verify that wall thickness does not exceed industry standard tolerance of + or – 1/16”.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions, comply with detailed installation requirements of final approved shop drawings. Set frames plumb, square and level.

B. Fasteners: Use screws, per manufacturer's standard installation instruction, for secure attachment to wall conditions.

C. Adjust doors and hardware to operate properly.

3.03 PROTECTION

A. Protect installed flush frames until completion of project.

B. Touch-up, repair or replace damaged areas before Substantial Completion.

C. Clean-Up: Clean frames, if necessary, using mild soap and water. Use NO abrasive agents.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each product specified.

B. Shop Drawings: Submit shop drawings showing details of each opening, including elevations, frame profiles, accessories and attachment.

C. Schedule: Submit a door frame schedule indicating number and location of each frame, matching door numbering on the Drawings.

1.03 QUALITY ASSURANCE

A. Manufacturing: Product manufactured under both ISO9001 and ISO14001 - 2015 EMS policy.

B. Source Limitations: Obtain metal frames through one source from a single manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Storage and Handling: Comply with manufacturer's recommendations for storage and handling. Protect from weather damage.

1.05 WARRANTY

A. Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Manufacturer: EzyJamb, 1700 Boulter Industrial Pkwy, Webster, NY 14850. Toll Free: 888- 399-5262. Fax: 585-545-3010. Web: www.ezyjamb.com.

2.02 TRIMLESS INTERIOR DOOR FRAMES

A. Double Rabbet Door Frames: EzyJamb DRC complying with the following.
   1. Material: 18 gauge galvanneal steel, one-piece with perforated flanges.
   2. Depth: Suitable for 1-3/4 inch thick doors, and applicable partition thickness.
   3. Fire Rating: Up to 90 minutes; Intertek listed.

B. Hardware: Refer to Section 08 7000
   1. Provide Concealed Hinges for hardware sets 74 and 77. Noted in Architectural drawings and details as 'Frameless Doors, Flush with Millwork panels'.
   2. Remaining Hardware 'by others'

2.03 FABRICATION

A. Fabricate frames and accessories accurately, with true lines and profiles.

B. Fabricate frames to receive specified hardware.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates for compliance with requirements for installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install trimless door frames in accordance with manufacturer's instructions and approved submittals including the following:
   1. Install frames plumb and square.
   2. Use door as a template when available to ensure proper alignment and clearances.
   3. Install frames securely using fasteners suitable for substrate.
   4. Leave frames ready for taping and application of drywall compound.
   5. Repair frames damaged during installation.
   6. Replace frames which cannot be successfully repaired.

B. Install accessory products in accordance with manufacturer's instructions and approved submittals including the following:
   1. Install products plumb and square.
   2. Install products in proper relationship to adjacent construction.
   3. Repair products damaged during installation.
   4. Replace products which cannot be successfully repaired.

3.03 CLEANING AND PROTECTION

A. Clean frames as recommended by manufacturer. Protect from damage until acceptance.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide wood doors, complete. Refer to Door Schedule for types and sizes.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Markings: Furnish door with stamp, brand, or identifying mark indicating door quality and construction. Identifying mark or separate certification to include inspection organization name, identification of standard for door construction, and identity of plant to which stamp was issued.

1.05 REFERENCE STANDARDS

A. American Society for Testing and Materials: (ASTM) E 152, "Fire Tests of Door Assemblies".

B. Architectural Woodwork Institute (AWI) Architectural Woodwork Standards: Specifications and Quality Certification Program, "Architectural Flush Doors".

C. U.S. Dept. of Commerce Commercial Standards: CS 236, "Mat-formed Wood Particle Board".

D. Rated doors and frames must meet NFiPA 80. **Affix metal plates to jamb side or top of door and frame stating the appropriate fire rating. Paper labels will not be accepted. Do not apply paint or stain over metal labels. Mask off the label before applying finish and remove masking after finish is dry.**

1.06 WARRANTY

A. Warranty: Submit written agreement using door manufacturer's standard form, signed by manufacturer, contractor, and installer, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show photographing of construction below in face veneers, or do not conform to NWMA and AWI tolerance limitations. Warranty period is for lifetime of installation.

B. Limitation and Exclusions:
   1. Defects are not natural variations in color or texture of wood. Improper finishing is considered a defect.
   2. Warp not considered a defect unless it exceeds 1/4 inch in the plane of the door itself. Warp is distortion in the door itself and does not refer to relationship of door to frame. Term "warp" includes bow, cup and twist. Amount of warp in door is measured by placing a straight-edge on the suspected concave face of door at any angle (horizontally, vertically, diagonally), with door in installed position. Measurement of bow, cup, and twist is made at point of maximum distance between bottom of straight-edge and face of door.

1.07 PRODUCT HANDLING

A. Protect wood doors during transit, storage and installation to prevent damage, soiling and deterioration. Comply with the "On-Site Care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with manufacturer's instructions.

B. Protection: Store doors in fully covered, well ventilated area. Protect from extreme changes in temperature and humidity.

C. Replace damaged doors at Contractor's expense.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Provide doors manufactured by one of the following:
   1. Masonite Architectural
   2. Graham
   3. Eggers
   4. VT Industries

2.02 GENERAL

A. Provide wood doors complying with applicable referenced standards for specified door kinds and door types.

2.03 ACCESSORY COMPONENTS

A. Light Frames: Refer to 08 8000 for glazing.
   1. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
      a. Wood Species: Same species as door faces
      b. Profile: Manufacturer's standard shape
      c. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.
   2. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.

2.04 SOLID CORE, ARCHITECTURAL FLUSH DOORS

A. All Solid Core, Architectural Flush Doors are to be manufactured in strict accordance with AWI Architectural Woodwork Standards. Furnish, 5-Ply doors with core fully bonded to stiles and rails with Type I Adhesive.

B. Particle Core Doors: AWS Type PC-5ME particle core doors meeting or exceeding requirements of AWS Chapter 9 with ANSI A208.1, Grade 1-LD-2 particleboard core.

C. Fire Rated Doors: AWS Type FD-5. Provide fire retardant treated wood blocking inside labeled doors to receive door hardware.
   1. Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
   2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
   3. Temperature-Rise Limit: **At vertical exit enclosures and exit passageways**, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
   4. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
   5. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
   6. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
   7. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

D. Face Veneers:
   1. Custom Face Veneer: Provide “A” Grade per AWI 1300, SWV (06 4000) panels applied to door, tagged SCS/MW on door schedule

2. Standard Face Veneer: Provide "A" Grade per AWI 1300, minimum 1/50" thick face veneers using Premium Quality, Rift Cut White Oak with custom-mixed stain to match SWV, tagged SCS on door schedule
3. Finish stain to be custom color selected by Architect.

PART 3 - EXECUTION

3.01 FABRICATION

A. Fabricate wood doors complying with Contract Drawings, with this Section and with the referenced standards for types specified.

B. Prefit doors at factory with following clearances:
1. 1/8" on top and hinge side
2. 1/8" on lock edge of single doors
3. 1/16" per leaf on pair meeting edges
4. 1/2" from finished floor
5. 3/4" max. from combustible floor
6. 3/8" max. from non-combustible sill or threshold
7. Bevel both edges of door (1/8" in 2"). Specific clearances to be shown on door schedule. Field trimming of fire doors will not be allowed.
8. Seal and refinish edges that are field cut to match factory finish.

C. Pre-machine doors for hardware as required by Hardware Schedule in Bid Documents and in accordance with requirements of AWI Section 1300. Hardware Schedule by hardware supplier to be furnished complete with templates for all hardware requiring door preparation. Hollow metal frame schedule to be furnished and to include exact location and size of hardware preparation. No door machining to be required for any totally surface-mounted hardware.

3.02 FACTORY FINISH

A. Factory finish doors in accordance with requirements of AWS Chapter 5 for Custom finish.
1. Finish System: AWS Chapter 5, Conversion Varnish System 5 with custom stain color to be selected by architect.
   a. Close Grain Woods:
      Washcoat
      Custom Stain
      Sealer
      Sand
      Top Coat
      Top Coat
   b. Open Grain Woods:
      Custom Stain
      Sealer
      Sand
      Top Coat
      Top Coat

2. Apply factory finish to both faces and all edges including top and bottom of all doors.

3.03 INSPECTION

A. Examine door frames and verify frames are correct type and have been installed for proper hanging of corresponding doors.

B. Do not proceed with installation until unsatisfactory conditions have been corrected in manner acceptable to Architect.

C. Install doors only after completion of other work which would raise moisture content of doors or damage surface of doors.

3.04 INSTALLATION

A. Fit, hang, and trim doors by openings.

B. Seal cuts made on job immediately after cutting, using clear water-resistant varnish or sealer.

C. Excessive filing or grinding of strike plate will not be accepted. Filing and grinding not to exceed 1/8" in any direction.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide plastic laminate faced wood doors, complete. Refer to Door Schedule for types and sizes.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Comply with NWMA Industry Standard I.S.1 and Architectural Woodwork Institute Specifications for type doors specified.

B. Markings: Furnish door with stamp, brand, or identifying mark indicating door quality and construction. Identifying mark or separate certification to include inspection organization name, identification of standard for door construction, and identity of plant to which stamp was issued.

1.05 REFERENCE STANDARDS

A. American Society for Testing and Materials: (ASTM) E 152, "Fire Tests of Door Assemblies".

B. National Woodwork Manufacturers Association, Inc.: "Industry Standard 1-Wood Doors", latest revision, and Commercial Standard CS17.

C. Rated doors and frames must meet NFiPA 80 (AFPC V2 703.4.1).

1.06 WARRANTY

A. Warranty: Submit written agreement using door manufacturer's standard form, signed by manufacturer, contractor, and installer, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show photographing of construction below in

face veneers, or do not conform to NWMA and AWI tolerance limitations. Warranty period is for lifetime of installation.

B. Limitation and Exclusions:
   1. Improper finishing is considered a defect.
   2. Warp not considered a defect unless it exceeds 1/4 inch in the plane of the door itself. Warp is distortion in the door itself and does not refer to relationship of door to frame. Term "warp" includes bow, cup and twist. Amount of warp in door is measured by placing a straight-edge on the suspected concave face of door at any angle (horizontally, vertically, diagonally), with door in installed position. Measurement of bow, cup, and twist is made at point of maximum distance between bottom of straight-edge and face of door.

1.07 PRODUCT HANDLING

A. Protect doors during transit, storage and installation to prevent damage, soiling and deterioration. Comply with the "On-Site Care" recommendations of NWMA and with manufacturer's instructions.

B. Protection: Store doors in fully covered, well ventilated area. Protect from extreme changes in temperature and humidity.

C. Replace damaged doors at Contractor's expense.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Provide doors manufactured by one of the following:
   1. Masonite Architectural
   2. Assa-Abloy (Graham/Maiman)
   3. Eggers
   4. VT Industries
   5. Oshkosh

B. Types of Doors:
   1. PC-HPDL-5: Nonrated and 20 minute rated
   2. Mineral core, FD-45-HPDL-5, 45-minute rated
   3. Mineral core, FD-60-HPDL-5 and FD-90-HPDL-5, 60- and 90-minute rated.

2.02 MATERIALS

A. Compliance: WDMA I.S.1-A.
   1. Aesthetic Grade: Premium.
   2. Duty Level: Extra heavy duty.

B. Door Thickness: 1-3/4 inches.

C. Stiles:
   1. 1-3/8 inches wide, before prefitting.
   2. Structural composite lumber (SCL).
   3. Edged with high-pressure decorative laminate before face laminates.

D. Rails:
   1. Structural composite lumber (SCL).
   2. Minimum Width Before Prefitting: 1-3/8 inches.

E. Door Assembly:
   1. Stiles and rails bonded to core.
   2. Monolithically sand core assembly to ensure minimum telegraphing of core components.

F. Laminates:
   1. Apply to core in hot press using Type I, exterior, water-resistant adhesive.
   2. HPDL to be .050 inch general purpose HPDL as selected by Architect.

      a. Standard laminate offering, tagged PL1 on door schedule
      b. Provide Formica/Pearl 938, tagged PL2 on door schedule

2.03 FABRICATION

A. Stile Edges: Apply laminate edges before application of face laminates.

B. Prefit Doors:
   1. Prefit and bevel doors at factory to fit openings.
   2. Prefit Tolerances: WDMA I.S.1-A.

C. Factory-machine doors for mortised hardware, including pilot holes for hinge screws and lock fronts required.

D. Top and Bottom Rails: Factory sealed.

E. Install factory vision panels with frame finish as selected by Architect.

PART 3 - EXECUTION

3.01 FABRICATION

A. Fabricate doors complying with Contract Drawings, with this Section and with the referenced standards for types specified.

B. Prefit doors at factory with following clearances:

   1. 1/8" on top and hinge side
   2. 1/8" on lock edge of single doors
   3. 1/16" per leaf on pair meeting edges

4. Bevel both edges of door (1/8" in 2"). Specific clearances to be shown on door schedule. Field trimming of fire doors will not be allowed.

C. Pre-machine doors for hardware as required by Hardware Schedule in Bid Documents. Hardware Schedule by hardware supplier to be furnished complete with templates for all hardware requiring door preparation. Hollow metal frame schedule to be furnished and to include exact location and size of hardware preparation. No door machining to be required for any totally surface-mounted hardware.

3.02 INSPECTION

A. Examine door frames and verify frames are correct type and have been installed for proper hanging of corresponding doors.

B. Do not proceed with installation until unsatisfactory conditions have been corrected in manner acceptable to Architect.

C. Install doors only after completion of other work which would raise moisture content of doors or damage surface of doors.

3.03 INSTALLATION

A. Fit, hang, and trim doors by openings.

B. Bevel lock edge of doors at rate of 1/8" in 2".

END OF SECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Factory fabricated interior sliding door frame and track systems with operating hardware.

1.02 RELATED REQUIREMENTS

A. Section 08 7000 - Door Hardware.

B. Section 08 8000 - Glazing: Product and execution requirements for glass type and installation.

1.03 REFERENCE STANDARDS

A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.
B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
D. ASTM E413 - Classification for Rating Sound Insulation 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide component dimensions, information on glass and glazing, and descriptions of hardware and accessories.
C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, and installation requirements.
D. Samples: Submit two samples, 12 inches (305 mm) long indicating typical sliding door frame construction, accessories, and finishes.
E. Certificate: Certify that sliding glass doors meet or exceed specified requirements.
F. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.
G. Manufacturer's qualification statement.
H. Installer's qualification statement.
I. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
B. Installer Qualifications: Company specializing in performing work of type specified in this section, with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site and store in manufacturer's protective cartons until openings are ready for door installation.

1.07 WARRANTY

A. Correct defective work within a two year period after Date of Substantial Completion.
B. Provide two year manufacturer warranty against excessive degradation of metal finishes, and include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Serenity Sliding Door Systems; SD101 - Surface Mounted Single Sliding, serenityslidingdoor.com/#sle.
   1. Solid panels and Glass Infill panels per drawings
   2. Finish : Sound Seal System and Auto Door Bottom.
   3. Glass Panels and door sizes per drawings.
   4. At Non-locking doors : Ladder Pulls provided by Door Hardware Supplier to match pulls in building.
   5. At Locking, Card Reader doors,
   6. Soft Close operation

2.02 SLIDING DOOR TRACK SYSTEMS

A. Type SD101 - Interior Sliding Door Track Systems:
   1. Description: Aluminum-cased frame that wraps wall at jambs and head of opening with trim; includes face trim at track, receiving channel, adjustable top track assembly, carriage assemblies having weight rating of at least 220 lb (99.8 kg), frames with integral double seal full gasketing, soft close units, receiving channel, brush type seals, and factory-prepped locks.
   2. Configuration: On wall surface-mount system as indicated on drawings.
   3. Frame Finish: Class I natural anodized (Standard).
   4. Door Type: Flush wood door with particleboard core (Standard).
   5. Wood Door Veneer: As selected by Architect.
      a. Provide stained finish as selected by Architect.
   6. Door Thickness: 1-3/4 inches (44.5 mm).
   7. Wall Thickness: 4-7/8 inches (123.8 mm), with 5 inch (127 mm) wide cased open frame.

2.03 PERFORMANCE REQUIREMENTS

A. Acoustical Performance: Provide door assembly and components with Sound Transmission Class (STC) rating of 35, minimum, when tested in accordance with ASTM E90, and ratings derived from ASTM E413.

2.04 ASSEMBLY

A. Provide wall blocking within metal stud walls as required by manufacturer of sliding door assembly.

B. Joints and Connections: Flush, hairline width, and waterproof; accurately and rigidly joined corners.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 clear anodic coating not less than 0.7 mils (0.018 mm) thick.

2.06 ACCESSORIES

A. Blocking: Provide support wall blocking as required for sliding door locations in accordance with sliding door manufacturer's requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on approved shop drawings.

3.02 PREPARATION

A. Prepare opening to permit correct installation of door unit as indicated.

3.03 INSTALLATION

A. Install sliding door units in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten sliding door assembly to wall construction without distortion or imposed stresses.

C. Install perimeter trim and interior closures.

3.04 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation from Plumb: 1/16 inch (1.6 mm).

C. Maximum Variation from Level: 1/16 inch (1.6 mm).

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch (3.2 mm) from 10 foot (3 m) straight edge.

3.05 ADJUSTING

A. Adjust hardware for smooth operation.

3.06 CLEANING

A. Remove protective material from factory finished surfaces.

B. Remove labels and visible markings.

C. Wash surfaces by method recommended and acceptable to sealant and sliding door manufacturer; rinse and wipe surfaces clean.

3.07 PROTECTION

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

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE

A. Provide aluminum doors and framing specified.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Fabricate exterior door and frame units to withstand the wind pressure loading shown or, or if not shown, 20 lbs. per sq. ft. on the gross area of the frames, doors, panels and glass, acting inward and also outward.

1.05 WARRANTY

A. Submit a warranty signed by the manufacturer, contractor, installer, agreeing to replace aluminum doors, windows, framing and glazing which fall in materials and workmanship within 2 years of the date of acceptance. Failure of materials or workmanship shall include, but not be limited to, failure in operation of doors, windows, and hardware, excessive leakage of air infiltration, excessive deflections, delamination of panels, deterioration of finish or metal in excess of normal weathering, and defect in accessories, weatherstripping, and other components of the work.
   1. Submit 10 year warranty by manufacturer of polyvinylidene fluoride (PVDF) coating.

B. Manufacturer's Product Warranty: Submit, for Owner's acceptance, manufacturer's warranty for entrance system as follows:
   1. Welded door corner construction shall be supported with a LIMITED LIFETIME WARRANTY for the life of the door under normal use. SEE SECTION 2.02, item C below for DOOR CONSTRUCTION.

1.06 ADJUSTMENT

A. After installation, make adjustments as necessary to insure proper operation of all hardware items.

B. Door Opening Force: In accordance with the Americans With Disabilities Act (ADA), adjust all door hardware so that the maximum force required for pushing or pulling open a door shall be as follows:
   1. Interior hinged doors: 5.0 lbf
   2. These forces do not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

C. Door Closers: If door is equipped with a closer, then the sweep period of the closer shall be adjusted so that from an open position of 70 deg., the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers who produce products that may be submitted to Architect for review are:
   1. Kawneer
   2. Oldcastle BE
   3. EFCO
   4. Tubelite

2.02 SWINGING GLASS DOORS

A. Material Standard: ASTM B 221; 6063-T6 alloy and temper.

B. The door stile and rail face dimensions of the 350 entrance door will be as follows:
   1. Vertical Stile: 3-1/2”
   2. Top Rail: 3-1/2”
   3. Bottom Rail: 10”

C. Entrance System Fabrication:
   1. Door corner construction shall consist of mechanical clip fastening, SIGMA 1-1/8” 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. Must be full penetration plug weld to leg of clip, 1-1/8” long fillet welds along top and bottom or rails at stiles intersection, no tie-rod construction of any type or partial design allowed. Meeting rail to still joint fillet weld “only” is NOT ACCEPTABLE. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable chord.

D. Refer to Section 08 7000 for Hardware.

2.03 FRAMING

A. Door, Storefront, and Windows: Provide standard shapes and moldings of Kawneer glazed framing system, or approved equal.
   1. Trifab VG 451T - Center Glazed SSG

2.04 ALUMINUM FLASHING AND BREAKMETAL

A. Provide 0.040 thick material for flashing and 0.090 material for breakmetal.

2.05 SEALANTS

A. Shop Applied: Provide GE Silpruf or Dow Corning 795 shop applied silicone sealant, or approved equal.

B. Field Applied:
   1. Structural sealant for glazing perimeter shall be GE SSG Ultra Glaze, Dow Corning 995, or approved equal.
   2. For soft joints adjacent to Architectural Precast Concrete and Cast Stone products, use Tremco, Inc., Spectrem 3, Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, Use NT.
   3. For other joints, select an appropriate sealant for the type of joint, movement and substrates involved. Acceptable products include Tremco Dymeric, GE 1200, Dow Corning 999, GE Silpruf, Dow Corning 795, Tremco Curtainwall Sealant, Dow Corning 790, PTI 606 Butyl Tape, Tremco Polyshim Tape, or approved equal.

2.06 FINISH

A. Factory finish with oven cured Kynar 500 based polyvinylidene fluoride (PVDF) coating, AAMA 2605 70% resin formulation in PREMIUM METALIC COLOR TO MATCH EXTERIOR CURTAINWALL SYSTEM
   1. Dry Film Thickness, ASTM D1400: 0.20 mil primer coat plus 1.0 mil color coat, 1.20 mil total, minimum thickness.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in compliance with manufacturer's recommendations and accepted shop drawings. Set units plumb, level and true to line, without warp or rack of framing, windows, and doors. Anchor securely in place. Secure to structure with non-staining, non-corrosive shims, anchors, fasteners, spacers, and fillers. Use care in erection so as not to mar, abrade, or stain finished surfaces. Where aluminum is to be placed in contact with steel, concrete and other dissimilar surface, back paint the aluminum before erection with an acceptable bituminous paint.

B. Seal frames with a Silicone approved sealant in color to match frames. Refer to Section 07 9000, and comply with requirements of that section.

C. Protection: After erection, adequately protect by masking, light motor oil, vaseline or other acceptable covering all exposed parts of the work and the finish from damage by grinding and polishing machines and/or by plaster, lime, cement, acid or other harmful substances.

D. Cleaning: After completion of all other work in the vicinity of the aluminum doors, windows, and framing, remove all masking, vaseline and/or other covering used to protect the work, and thoroughly clean the aluminum surfaces with soap and plain water or a petroleum product such as white gasoline, kerosene, or distillate. Do not use abrasive cleaning agents.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Refer to Division 01 Section "Project Requirements".

1.3 SUBMITTALS

A. Product Data: For each type of all-glass entrance component specified. Details of construction relative to materials, dimensions of individual components, profiles, and finishes, including:

1. Glass panels.
2. Rail and Patch fittings.
3. Closer and pivots.
4. Door hardware and accessories.

B. Shop Drawings: Show details of fabrication and installation, including the following:

1. Plans, elevations, and sections.
2. Details of fittings.
3. Hardware quantities, locations, and installation requirements.
4. Anchorages and reinforcement.
5. Glazing details.
6. Door hardware locations, mounting heights, and installation requirements.

C. Samples for Verification: For each type of exposed finish indicated, prepared on Samples of size indicated below as required by Architect.
1. Metal Finishes: 6-inch (150-mm) long sections of rail fittings.
2. Glass: 12-inch (300 mm) square, showing exposed-edge finish and tint.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, sidelites, transoms, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

E. Maintenance Data: For all-glass systems to include in maintenance manuals.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify opening dimensions of all-glass entrances by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.5 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of all-glass entrances that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures.
2. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
3. Failure of operating components to function normally.

C. General Warranty Period: Two years from date of Substantial Completion.

1. Concealed Floor Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design all-glass entrances and storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of all-glass entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

C. Structural Loads:
1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings
3. Deflection Limits: In accordance with GANA “Fully Tempered Heavy Glass Door and Entrance Systems Design Guide.”

D. Seismic Performance: All-glass entrances and storefronts shall withstand the effects of earthquake motions determined according to ASCE/SEI 7. Coordinate requirements with structural engineer.

E. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

F. Accessibility Standards: Comply with applicable provisions in Accessibility Guidelines for Buildings and Facilities ICC (ANSI) A117.1 and requirements of authorities having jurisdiction.

2.2 MANUFACTURERS

A. Basis-of-Design Products: Subject to compliance with requirements, provide the named product, or the comparable product by one of the alternate specified manufacturers. Comparable products are subject to review and approval through the submittal process specified.

B. Manufacturers (All Glass Doors): Subject to compliance with requirements, provide products by one of the following:

1. Rockwood (All Glass Door components).
2. Trulite Glass and Aluminum Solutions.
3. Virginia Glass Products Corporation.

2.3 INTERIOR GLASS ENTRY DOORS

A. DOOR MATERIALS
1. Clear Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated surfaces), Type I (transparent), Class 1 (clear) requirements. Provide products of thickness indicated that have been tested for surface and edge compression according to ASTM C 1048 and for impact strength according to CPSC 16 CFR, Part 1201 for Category II materials.

a. Thickness: 1/2 inch (13 mm)
b. Exposed Edges: Flat polished.
c. Butt Edges: Flat polished.
d. Corner Edges: Mitered.

2. Aluminum: Alloy and temper recommended by manufacturer for use and finish indicated, but not less than the strength and durability properties of ASTM B 221 (M), alloy 6063-T5.

2.4 DOOR COMPONENTS

A. Patch Fittings: Provide manufacturer's standard patch fittings for all-glass entrance configurations required, unless otherwise indicated, and as follows:

1. Material: Aluminum.
2. Basis of Design: Rockwood #PFD.

B. Floating Transom Bar: Manufacturer's standard aluminum, floating transom bar clad in metal matching fittings in size recommended by manufacturer for application indicated.

1. Support Fins: Tempered glass matching the transom glass.

C. Sidelite Channels: Provide manufacturer's standard head and sill channels for sidelite and transom-head support matching fitting-metal finish, unless otherwise indicated.

D. Concealed Sidelite Channels: Provide manufacturer's standard recessed head and sill channels for concealed sidelite and transom-head support, unless otherwise indicated.

E. Rails: Manufacturer's standard continuous horizontal fittings and as follows:

1. Rail Locations: As follows:

a. Door tops and bottoms.
b. Transom tops. Provide with manufacturer's standard fixed-mounting system.
c. Sidelite tops. Provide with manufacturer's standard fixed-mounting system.
d. Sidelite bottoms. Provide with manufacturer's standard fixed-mounting system.

2. Top Rail Height: 6 inch (153 mm).
3. Top Rail Profile: Square.
4. Bottom Rail Height: 6 inch (153 mm).
5. Bottom Rail Profile: Tapered no less than 60 degrees from horizontal.
6. One piece dry glazed compression system that accommodates 3/8” to 9/16” or 5/8” to 13/16” thick glass.
7. End Caps: One-piece aluminum, beveled.
8. Material: Aluminum.
9. Material: Bright or satin stainless-steel-cladding.
10. Basis of Design: Rockwood #DRT/DRS x Height.

F. Accessory Fittings: Manufacturer's standard accessory fittings matching patch fitting or rail metal and finish for the following:

1. Overhead doorstop.
2. Center-housing lock.
3. Glass-support fins.

G. Anchors and Fastenings: Manufacturer's standard concealed anchors and fastenings.

H. Weather Stripping; Brush type; replaceable without removing all-glass entrance doors from pivots.

2.5 ENTRANCE DOOR HARDWARE

A. General: Heavy-duty entrance door hardware units in sizes, quantities, and types recommended by manufacturer for all-glass entrance systems indicated. For exposed parts, match metal and finish of patch fittings and rail fittings.

B. Refer to section 080671 “Door Hardware Schedule” for specific hardware sets.

C. Tubular Exit Device Electric Strikes: Provide electric strikes designed to work with tubular glass door exit devices that conforms to ANSI A156.31, Grade 1. Electric strikes shall be of stainless-steel construction with field selectable fail safe/fail secure and dual 12/24 VDC. Provide lock monitor when specified.

1. Manufacturers:

a. Rockwood (GS) - ESK-1600 Series.

D. Overhead Concealed Closers (Medium Duty): Center hung, BHMA A156.4, Grade 1; units including arms, pivots, cover plates, mounting clips, and accessories required for complete installation. Provide separate closing and latching valves for closing speed, latch speed, backcheck, and optional hold open.

1. Compact cast iron closers capable of being fully concealed in the frame head for center hung applications.
2. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, interior or exterior application, and exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ICC/ANSI A117.1.
3. Closer Accessories: Provide door closer accessories including custom spindles and templates as required for proper installation.
4. Double acting, non-handed with adjustable spring power size 1 through 3.
5. Manufacturers:

a. Rockwood (GS) - OHC 609 Series.

E. Floor Stops and Overhead Door Stops and Holders: ANSI/BHMA A156.16, Grade 1 certified. Provide floor stops as specified unless overhead door stops and holders are indicated in the hardware sets. Overhead stops and holders to be concealed type. Track, slide, arm and header bracket to be constructed of stainless steel and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

a. Rockwood (GS).
b. Norton Rixson (RF).

2.6 FABRICATION

A. General: Fabricate all-glass entrance components in sizes, profiles, and configurations indicated on Drawings.

B. Provide holes and cutouts in glass to receive hardware, fittings, and accessory fittings before tempering glass. Do not cut, drill, or make other alterations to glass after tempering.
1. Fully temper glass using horizontal (roller-hearth) process, and fabricate so that when glass is installed, roll-wave distortion is parallel with bottom edge of door or lite.

C. Factory assemble components and factory install hardware and fittings to greatest extent possible.

2.7 FINISHES

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

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

2.8 ALUMINUM FINISHES

A. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

3.2 DOOR INSTALLATION

A. General: Comply with all-glass entrance manufacturer's written installation instructions and approved shop drawings.

B. Install all-glass door assemblies after other finishing operations have been completed. Coordinate installation of recesses housings with installation of adjacent finishes.

C. Set units level, plumb, and true to line, with uniform joints.

D. Maintain uniform clearances between adjacent components.

E. Set, seal, and grout floor closer cases as required to suit hardware and substrate indicated.

F. Install butt-joint sealants according to manufacturer's instructions and as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

3.3 ADJUSTING AND CLEANING

A. Adjust all-glass entrance doors and hardware to produce smooth operation and tight fit at contact points and weather stripping.

B. Remove excess sealant and glazing compounds and dirt from surfaces.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure all-glass entrances are without damage or deterioration at the time of Substantial Completion.

3.5 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.6 DOOR HARDWARE SETS

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

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

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Refer to Section 08 7000, Door Hardware Sets, for hardware sets.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish labor, materials, tools, equipment, and services for Unitized Curtain Wall Assemblies, as indicated, in accordance with provisions of Contract Documents.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications:
Manufacturer acceptable to enclosure contractor and capable of specified components of exterior enclosure assemblies that meet or exceed testing and energy performance requirements indicated and documenting performance by certified test reports.

B. Installer Qualifications/Submittals:
1. Firm with not less than ten (10) years successful experience in erection and installation of curtain wall systems similar in design and scale of systems proposed for this project.
2. Certified by curtain wall manufacturer in erection and installation of manufacturer's products.
3. Submit a minimum of five (5) references of projects similar in size and scope.
4. Submit results of monthly onsite inspections conducted by manufacturer's field service representative, to assure proper installation, to Architect.
5. Upon completion of project, submit report from manufacturer's field service representative.
    a. See Submittals, Contract Closeout Information, below.

B. Specialty Structural Engineer:
1. Engineer Unitized Curtain Wall Assembly to support superimposed loads, design moments, shears, and other forces.
2. Include headers and reinforcing members around openings.
3. Incorporate details defining method of attachment throughout system and anchorage to primary structure.

C. Field Testing Agency Qualifications:
1. In compliance with ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

D. Laboratory Mockup Testing Agency Qualifications:
In compliance with ASTM E329 and ASTM E699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Agreement as complying with ISO/IEC17025.

E. Product Components/Assemblies:
1. Drawings and Specifications establish requirements for aesthetic effect and performance characteristics of assemblies.
2. Aesthetic effect is judged solely by Architect and determined by dimensions, arrangement, alignment and profiles of components and assemblies as they relate to sightlines, to one another, and adjoining construction.
    a. Do not revise intended aesthetic effect without Architect's approval.

F. Submit proposed revisions to Architect for review. Comply with Following Standards: Compliance with specified performance requirements shall be demonstrated by computer simulation per the guidelines of NFRC standards.
   1. Aluminum Association (AA)
   2. American Architectural Manufacturers Association (AAMA)
      a. In addition to specified AAMA standards, comply with applicable portions of the AAMA CW-DG-1, Curtain Wall Design Guide Manual.
   3. ASTM International (ASTM)
   4. American Welding Society (AWS)
   5. International Accreditation Service (IAS)
   6. International Laboratory Accreditation Corporation (ILAC)
   7. International Organization for Standardization (ISO)
   8. International Electrotechnical Commission (IEC)
   9. National Fenestration Rating Council (NFRC)
   10. Society for Protective Coatings (SSPC)
   11. Window & Door Manufacturers Association (WDMA)

G. Welding and Welders:
   1. Welders licensed in accordance with local building regulations.
   2. Perform welding in conformance with AWS Structural Welding Code.
   3. AWS-D1.1 Structural Welding Code - Steel.
   4. AWS-D1.2 Structural Welding Code - Aluminum.
   5. AWS-D1.6 Structural Welding Code - Stainless Steel.

H. Visual Mockups:
   1. Construct mockup to verify selections made under sample submittals and to demonstrate aesthetic effects. Build wall assembly on site for Architect review at locations as directed by Construction Manager and agreed by Curtain Wall Contractor.
      a. Refer to mockup on Drawings for dimensions, components, profiles, configurations, and adjacent construction.
         1) Panel Mockup: Panels and sizes to be determined.

      b. Mockup wall constitutes standard of quality for balance of cladding work.
      c. If not acceptable, reconstruct.
      d. Do not proceed with work until mockup walls are approved by Architect and Owner.

1.3 SUBMITTALS

A. See Section 01 3000 for requirements.

B. Shop Drawings:
   1. Elevations, sections, and details for review of design intent and anchorage to building frame.
      a. Include details addressing provision for expansion and contraction and draining moisture from within assembly.
      b. Show adjoining materials based on approved shop drawings and provide interface detailing at head, sills and jambs, roofing, waterproofing and soffits.
      c. Detail glazing, copings, perimeter flashing and trim, sealants and backer rod, air and moisture barrier and seals to framing, thermal insulation, back pans and fire protection.
      d. Include detailed connections of mullion extensions to curtain wall system.
      e. Show glass type designation on building elevations and glazing schedule including types to be installed.
      f. Include door schedule showing hardware, automatic door and access control components, and reinforcing as recommended by manufacturer.

g. Show imposed loads on connection details to structure.
h. Reference structural calculations to details.
i. Submit structural calculations concurrent with Shop Drawings.
j. Include full size isometric details of each representative type of vertical to horizontal intersections. Include 50 full size isometric details of locations to be identified by the Architect.

2. Visual Mockup:
   a. Submit shop drawings for mockup wall assembly integrating shop drawings of each finish material.
   b. Prior to construction of mockup wall, provide samples as specified in respective Specification Sections.
   c. Submit structural loads transferred to back-up structure for mockup wall concurrent with drawings. Back-up structure provided by other trades.
3. Performance Mockup:
   a. Submit shop drawings for mockup wall assembly integrating shop drawings of each finish material.
   b. Prior to construction of mockup wall, provide samples as specified in respective Specification Sections.
   c. Submit structural calculations for mockup wall sealed by Specialty Structural Engineer concurrent with drawings.
   d. Submit as-built record drawings.
   e. Submit Test Reports identifying system compliance with performance criteria specified herein.
4. Coordinate submission of the unitized curtain wall assembly shop drawings with submission of all other building enclosure wall shop drawings.

C. 3D Model:
1. LOD minimum of 300.
2. Include comprehensive illustration of entire assembly.

D. Thermal Modeling:
Provide thermal modeling submission to demonstrate assembly thermal performance and condensation resistance requirement has been met. Condensation resistance shall be demonstrated through computer simulation of typical and critical conditions.
1. Simulation Modeling reports during Preconstruction for evaluation of proposed details.
2. NFRC Simulation Report based on performance mock-up record details.
3. Provide Unitized Curtain Wall Assembly area weighted average thermal performance data. Include modeling of each unique configuration, including effects from penetrations through and attachments to the assembly.

E. Samples:
1. Prior to construction of mock-ups, provide material samples as specified in respective Specification Sections included as part of mock-up wall.
2. Include samples of all ancillary components of the custom-designed unitized curtain wall, including glass, cured sealants, fasteners, gaskets, setting blocks and related items.
3. Range samples of aluminum curtain wall finishes.
   a. Manufacturer's (PPG or Akzo) finishes for color selection.
4. Assembly to be available prior to construction based on successful performance mockup. Assembly to include all components, including intersection of mullions.
   a. As soon as practical after the custom extruded profiles become available, provide samples for Owner and Architect’s review and acceptance.

b. Samples shall include all major system components, including aluminum, glass, sealants, gaskets, a stack joint, projections/trim, and cladding, as specified, in order to verify selections made under sample submittals and to demonstrate the quality of materials and assembly.

5. Provide full size glass sample to project site.
6. Sample size 48-inch minimum length or square.

F. Project Information:
1. Project-Specific Fabrication and Installation Quality Control Program: Contractor shall develop fabrication and installation quality control program and quality control reports, shop and field, specifically for this project which meet or exceed documentation of testing required for manufacture warranty requirements of components utilized in the fabrication or installation of the assembly.
2. Engineering calculations indicating design moments, shears, and other forces sealed by Specialty Structural Engineer.
   a. Submit concurrent with Submittal (Shop) Drawings.
   b. Calculations are to include analysis of all elements including those represented on the performance mock-up.
3. Engineering Submittal (Shop) Drawings to be reviewed and stamped by a professional engineer registered in the State the project is located.
4. Communicate special requirements, changes, or modifications to curtain wall and interface between curtain wall support system and building structural frame.
5. Sample of Special Warranty.
6. Meeting minutes from Pre-installation Conference.
7. Installer Qualifications per Quality Assurance, above.
8. Certified independent laboratory test reports verifying compliance with performance characteristics.
9. Field Quality Control Reports.

G. Contract Closeout Information:
1. Record Drawings: Following completion of the Testing Program, submit revised “as-built” submittal (shop) drawings and engineering analyses, incorporating all changes made to Performance Mockup during the course of the testing into Submittal (Shop) Drawings.
2. Minutes of Preinstallation Conference.

1.4 SPECIAL WARRANTY

A. Fabricator/Installer's written two (2) year warranty, agreeing to repair or replace defective materials or workmanship, including noncompliance with specification requirements and industry standards, which result in failure of the curtain wall system, finish, glass or parts.
1. Failure not meeting specifications includes but not limited to: Defects in materials, workmanship, water infiltration of assembly, air infiltration of assembly, glazing, sealant or defects which influence system capacity to perform as a weather tight envelope in conformance with specified performance criteria.
2. Glass: Refer to Section 08 81 23 - Exterior Glass and Glazing. Submit pass-through warranties from glass manufacturer and glazing fabricators.
3. Finish: Coatings Manufacturer and applicator to warrant paint for a period of 20 years against failure (cracking, flaking, blistering, or combination of finishes) of PVDF finish. Submit pass-through warranties from paint manufacturer and painters.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Custom Unitized Curtain Wall Assemblies: MG McGrath, Inc., 1387 East Cope Ave; Maplewood, MN 55109; Tel: 651.704.0300; Fax: 651.704.9989; Email: info@mgmcgrath.com; Web: www.mgmcgrath.com

2.2 PERFORMANCE/DESIGN CRITERIA

A. Drawings and Specifications:
   1. Contract Documents provide Architectural diagrammatic drawings and performance specifications for design, fabrication, and installation of exterior glazing system.
   2. Architectural details shown are intended as a guide for aesthetic and interface requirements of various components of exterior walls and adjacent work.
   3. Requirements shown establish basic system concept of glazing system.
   4. Drawings are not to be construed as engineering design, or adequate to meet engineered design requirements.

B. Contractor Responsibilities:
   1. Single source responsibility for building envelope design, engineering, fabrication, transportation, erection and testing of Unitized Curtain Wall Assembly.
   2. Design and engineering of curtain wall systems within Architect's aesthetic parameters of system and specified performance criteria and code required provisions.
   3. Engineering and design and interface detailing of components and materials, factory fabrication, assembly, sealing and glazing of unitized curtain wall.
   4. Develop conditions through envelope contractors Submittal (Shop) Drawings including interface detail with other trades to same level of aesthetics in compliance with performance criteria as indicated for detailed areas. Cross-coordinate submittals of details from all adjacent and penetrating trades.
   5. Minor deviations in dimensions and profiles may be considered provided they do not change design concept or system performance.

C. System Design:
   1. Unitized curtain wall types: See Architectural drawings.
   2. Components:
      a. Provide gaskets, sealant, glazing, elastomeric and aluminum flashing, aluminum air/water barrier panel, back pans, insulation, trim, copings, closure plates, metal plate wall panels, interior aluminum window sills, extruded aluminum applications and aluminum finish system closures as required for work under this section.
      b. Spandrel Conditions (inside to outside):
         1) Prefinished aluminum back pan vapor barrier.
         2) Stiffeners for fire containment system assembly at slab lines.
         3) Mineral wool insulation tight to the back pan and with 1 IN air gap between interior face of IGU and mineral wool mechanically pinned in sealed cavity between vapor barrier aluminum air/water barrier and panel.
         4) Aluminum air/water barrier panel (shadow box).
         5) Aluminum or glass face cladding assembly.
      c. Split mullions to accommodate movement in horizontal and vertical directions.
      d. Glaze system and furnish specified glass units.
         1) Provide tempered, heat-treated or laminated glass units as code or stress analysis requires.

e. Support insulation and fire stopping system within aluminum curtain wall framing and entrance systems.
f. Interior Aluminum Window Sills: Shall support a 300 LB human load. Load caused by personnel standing on sill for maintenance or other purposes.

D. Thermal Expansion and Structural Movement:
1. Expansion and contraction, caused by changes in surface temperature equal to delta T.
   a. Delta T for this project: 200 DEGF. Temperature range may be assumed to be minus 20 to 180 DEGF. Temperature range will vary based on color selections and project location.
   b. Thermal contraction/expansion in this range shall not cause buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects over this temperature range.
   c. Operating doors shall function normally over this temperature range.
2. Structural movements of building structure
   a. Inter-story drift caused by wind forces.
      1) h/400 or 1 IN maximum.
   b. Live load plus superimposed deal load deflection of the supporting members.
   c. L/360 or 1/2 IN maximum.
   d. Perimeter beam and/or slab deflection due to superimposed curtain wall dead load.
      1) 1/2 IN maximum.
   e. Structural tolerance of curtain wall assembly: +/- 1 IN in all directions.

E. Thermal Transmittance (U-Value):
1. Calculate U-Value for system by thermal modeling utilizing Therm Windows 7.3.
2. U-Values:
   a. Curtain Wall:

Wall System	Vision	Spandrel	Overall	(IG Gas Fill)
Typical CW	0.33 Btu/hr-ft^2-F	0.1 Btu/hr-ft^2-F	0.06 Btu/hr-ft^2-F	Argon

3. Interior Design Condition:
   a. Temperature: 74 DEGF.
   b. Relative humidity: 35 percent.
4. Exterior Design Conditions:
   a. Temperature: 6 Deg F.
   b. Exterior wind speed: 15 miles per hour.
5. Condensation is not permitted on any interior surface under the specified conditions.

F. Condensation: Defined as water, ice, or frost occurring inboard of the air barrier line of the unitized curtain wall, or water that is not collected and managed by drainage or evaporation in a gutter system. Gutter systems shall not compromise the air infiltration, water penetration, or thermal performance of the unitized curtain wall.

G. Provide a sealed assembly at floor lines, including within vertical chambers of curtain wall framing, to prevent air leakage between floors. Provide mullion plugs at top of units at parapets and at bottom cantilevers at soffit conditions. Provide closure plate at bottom of system transition to soffits as shown.

H. Air Infiltration Limits:
   1. Fixed glazing: Less than 0.06 CFM/FT2 when tested at 6.24 PSF.
   2. Operable doors:
      a. Less than 0.50 CFM/FT2 when tested at 6.24 PSF.

I. Not Permitted: Excessive vibration due to harmonics, noises caused by thermal movement, and thermal movement transmitted to other building components which either independently or jointly cause the loosening, weakening, or fracturing of fasteners or system components.

J. Gravity Deflection Limits: **Confirm w/ Structural Engineer**
   1. Deflection of member in direction parallel to plane of wall, when carrying its full dead load, not exceeding an amount which will reduce glass bite below 75 percent of design dimension.
   2. Limit dead load deflection to L/360 or 1/8 IN, whichever is less.
   3. Provide minimum 1/8 IN clearance between member and top of fixed panel, glass, or other fixed part immediately below.
   4. Clearance between member and operable door, minimum 1/16 IN.

K. Load Requirements:
   1. Design curtain wall systems and anchorage to meet Design Loads.
      a. Wind loads: Use most restrictive of following:
         1) Wind pressures as required per local building code based on wind speed, exposure factor and importance factor noted in the Structural Drawings.
      b. Deflection values: Use most restrictive of the following:
         1) Limit deflection to comply with Building Code as locally adopted and amended.
         2) Tower: Deflection of framing member in direction normal to plane of wall not exceeding 1/175 of clear span or 3/4 IN whichever is least.
            a) Maximum deflection at cantilevers not to exceed 2L/175.
         3) Maximum glass deflection:
            a) Maximum glass deflection due to wind load: 1 IN (25 mm).
            b) Maximum glass deflection due to building code guard rail loads for glazing units adjacent to walking paths both interior and exterior as identified by Architect: 0.59 IN (15 mm).
            c) Use a 200 LB point load over a 1 FT x 1 FT area applied at glazing centers up to 42 IN above the walking surface or a 50 LB per LF load at same height.
         4) Deflection of metal panel short direction not exceeding 1/60 of span.

L. Structural Requirements:
   1. Uniform design load:
      a. Conduct in accordance with ASTM E330.
      b. Test at 100 percent design test pressure, both positive and negative, acting normal to plane of wall.
         1) Pass criteria: Deflection shall not exceed design deflection limits per Wind Load Requirements above.
         2) Positive and Negative Test Load: +32 psf / -59 psf.
      c. Test at 1.5 times design test pressure, both positive and negative, acting normal to plane of wall.
         1) Pass criteria:
            a) No glass breakage; permanent damage to fasteners, hardware parts, or anchors.
            b) No damage to make curtain wall insert vents inoperable.
            c) No permanent deformation of any main frame member in excess of 0.2 percent of its clear span.

d. Deflection of framing member in direction normal to plane of wall not exceeding 1/175 of clear span or 3/4 IN whichever is least.
   1) Maximum deflection at cantilevers not to exceed 2L/175.
e. Maximum glass deflection for other glazing units 1 IN.
f. Deflection of exposed metal panel short direction not exceeding 1/60 of span.
g. Measure deflection from gauges located on vertical mullions and horizontal members.

2. Water test performance:
   a. No uncontrolled water leakage at 15 PSF static pressure differential, when tested in accordance with ASTM E331.
   b. No uncontrolled water leakage at 15 PSF dynamic pressure differential, when tested in accordance with AAMA 501.1. No uncontrolled water leakage: Defined as no visible water intrusion to, or visible water on, interior surfaces.
   c. All extrusions to be utilized as part of the assembly must be included in the mockup test report.
3. Vertical interstory movement: Vertically displace intermediate level support 5/8 IN up and down three complete cycles leaving wall in open position to repeat static water testing, then return wall to nominal position.
4. Air infiltration: Test specimens in accordance with ASTM E283.
   a. Pass criteria: Performance mockup air infiltration shall be less than 0.06 CFM/FT2 when tested at a pressure differential of 6.24 PSF.

2.3 MATERIALS

A. Aluminum Components:
   1. Alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish.
   2. Extrusions: ASTM B221.
   3. Sheet/plate: ASTM B209.
   4. Structural profiles: ASTM B308/B308M.
   5. Extruded structural pipe and tubes: ASTM B429.
   6. Welding rods and bare electrodes: AWS A5.10/A5.10M.
   7. Thicknesses to comply with structural loading requirements (increase thickness as required by structural calculation), but not less than:
      a. Principal extrusions: Minimum 0.125 IN.
      b. Extruded trim: As structurally required.
      c. Formed trim: Minimum 0.125 IN.
   8. Submit calculations for alternate alloys or tempers verifying structural adequacy for alloy provided.

B. Steel Components:
   1. Smooth and free from surface blemishes.
   2. Structural shapes, plates, and bars: ASTM A36, ASTM A992, ASTM A572 or ASTM A529 as required by manufacturer's design and engineering.
   3. Cold-formed hollow structural sections: ASTM A500, ASTM A53 or ASTM A1085 as required by manufacturer's design and engineering.
   4. Cold-rolled sheet and strip: ASTM A1008.
   5. Hot-rolled sheet and strip: ASTM A1011.
   6. Provide steel reinforcements as required to meet performance requirements.
   7. Finish exposed reinforcing steel to match the glazing system.

C. Framing Members:
   1. Manufacturer's extruded or formed aluminum framing members of thickness required and reinforced to support imposed loads.
      a. Sharp, straight profiles free of defects or deformations.
   2. Framing members, transition members, mullions and mountings shall be of extruded aluminum grade as required for structural and finish requirements.
   3. Minimum thickness of structural portions of members shall be 0.125 IN.
   4. Male/Female vertical mullions: per approved profiles and details.
   5. Horizontal transom: per approved profiles and details.
   6. Horizontal expansion transom minimum: per approved profiles and details.
   7. Design shall include a method of weepage to the exterior for any condensation or leakage.
   8. Construction for fixed framing shall consist of vertical and horizontal aluminum extruded mullions designed to allow replacement of vision shadow box lites and spandrel panels from exterior.
   9. Door frames shall be provided with snap on type door stop with inserts for door silencing.
   10. The systems shall be unitized and shop glazed to the extent possible.

D. Brackets and Reinforcements:
   1. High strength aluminum units.
   2. Nonmagnetic stainless steel, 300 series.
   3. Hot dip galvanized steel.
      a. Comply with ASTM A386.
   4. 1/4 IN thick minimum stainless-steel plates at threaded fasteners, where the threaded fastener is required to engage the stainless-steel plate.
   5. Non-staining, nonferrous shims.

E. Embedments: Adjustable connections between curtain wall and building structure: per curtain wall manufacturer design and approved details.

F. Fasteners:
   1. Screws and bolts connecting aluminum parts in wet areas: ASTM A666 type 300 series stainless steel.
      a. Interior screws connecting curtain wall components: Alloy steel fasteners with Stalgard coating (100SD, 178SD, 300SD, 600TF, 702TF) or equal.
      b. Interior bolts connecting curtain wall components: Zinc plated steel bolts, nuts, and washers (505HC, 507HC, 602HC, 607HC).
   2. Tee bolts, steel parts, or aluminum and steel parts connecting to embedment:
      a. ISO 898 Grade 4.6 minimum hot dip galvanized steel.
      b. Acceptable Manufacturer: Halfen, Jordahl or equal.
      c. At unique conditions/locations, connections shall be SAE grade 5 per curtain wall contractor's design and engineering. Curtain wall contractor to call-out unique locations to Structural Engineer of Record for evaluation prior to installation. Remaining fasteners and connection parts: ASTM A666 type 304 or 316 stainless steel.
   3. Fastener alloys and coatings:
      a. Compatible with adjacent materials to prevent galvanic action and corrosion.
      b. Minimize use of self-drilling screw fasteners to connections where access cannot be arranged to place a bolt.
   4. Use exposed fasteners only where unavoidable for application of hardware.
      a. Match finish of adjoining metal.
      b. Countersink flat head machine screws for exposed fasteners.

5. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
6. Reinforce members as required to receive fastener threads.

G. Anchors:
1. Six way adjustable: Up, down, in, out, left, right.
2. Minimum adjustment of 1 IN all directions.
3. Finish compatible with adjoining materials and recommended by manufacturer.

H. Concrete and Masonry Inserts:
1. Hot-dip galvanized.
   a. Comply with ASTM A123/A123M or ASTM A153/A153M requirements.
2. Stainless steel.

I. Glass:
1. See Section 08 8000 for glass to be installed under this section.
2. Provide heat strengthened and tempered glass where necessary to withstand loads or comply with local codes.

J. Glazing and Gasket Materials:
1. Non-shrinking, weather resistant, and compatible with contacting materials.
2. Setting blocks/edge blocking:
   a. Silicone.
   b. Provide in sizes and locations recommended by GANA Glazing Manual.
3. Back bedding tape, expanded cellular glazing tape, toe bead, heel bead and cap bead:
   a. Provide in accordance with AAMA 800.
4. Glazing gaskets: Silicone.

K. Flashing:
1. Minimum 0.125 IN extruded aluminum where glazed into curtain wall.
   a. Formed aluminum Flashings, see Section 07 62 00.
   b. Extruded aluminum Copings, see Section 07 62 00.
      1) Comply with ANSI ES-1 Testing of Shop-Fabricated Edge Metal.
2. Sizes and shapes indicated.
3. Finish to match wall system if exposed.
4. Mill finish if concealed.
5. Provide dissimilar metals protection at points of masonry contact.

L. Weatherstripping: Manufacturer's standard replaceable stripping.

M. Back Pans:
1. Minimum 22 GA galvanized steel with stiffeners as required for firesafing retention.
2. Profile: Coordinate with application,
3. Insulation:
   a. Mineral wool, R-value per performance requirements.
   b. 3.5 LBS/FT3 density.
   c. Comply with ASTM C612.
4. Provide at spandrel glass panels.

N. Doors:
1. Extrusions aluminum sections assembled with tension rods.
2. Member wall thickness, minimum: 0.125 IN.
3. Member depth: 2-1/4 IN.
   a. Thermal Break: Glass fiber reinforced polyamide nylon providing minimum 3/8 IN thermal separation.
4. Vertical Stiles and Top Rail, width: 5 IN.

5. Bottom Rail: 10 IN.
6. Provide manufacturer's standard weatherstripping at edges and door bottom.
7. Reinforce doors and frames to receive hardware specified in Section 08 7000

O. Structural Silicone Sealant:
1. See Section 07 9000
2. Exposed sealant color: Black.
3. Provide sealants and caulking required within and around work of this section, in accordance with manufacturer's recommendations.

P. Zinc-Rich Primer for Ferrous Metal Surfaces: Tnemec-Zinc 90-97 by Tnemec Company, Inc.

Q. Bituminous Coatings:
1. Cold applied asphalt mastic.
2. Comply with SSPC-PS 12.
3. Compounded for 30 mil thickness per coat.
4. Mastic for expansion joints:
5. Manufacturer's standard.
6. Provide options for PVC tape and plastic separators. Contingent upon review by Architect.

R. Transition Boot:
1. Manufacturer’s standard system.
2. Pre-cured low modulus silicone extrusion.
3. Size to fit joint widths indicated.
   a. Product: At exposed conditions:
      1) 123 Silicone Seal by Dow Corning Corporation.
      2) UltraSpan US1100 by GE Advanced Materials - Silicones.
      3) Sil-Span by Pecora Corporation.
      4) Or approved equal.
   b. Product: At concealed conditions only: STS transition sheet by Dow Corning or approved equal.
   c. Adhesive/sealant: As recommended by transition boot manufacturer.

S. Perimeter Fire Containment System:
1. See Section 07 8500

2.4 FINISHES

A. General: Finish exposed areas of aluminum curtain wall components in accordance with AAMA Voluntary Guide Specification.
1. Color Retention: 5 delta E’s as recommended by AAMA 2605-17a Section 8.9.1.2 .

B. Color Uniformity: 2 delta E’s as recommended by AAMA 2605-17a Section 8.1.Exterior Finish:
1. Standard: AAMA 2605.
2. 70 percent PVDF, Hylar 500 or Kynar 500, resin. Finish to allow Zero VOC’s emitted into facility of application.
3. Pre-treatment process: Manufacturer’s standard.
4. Factory applied, oven baked.
5. Specular Gloss, ASTM D523: 30 +/- 5 measured at 60 degree meter setting coil coating and medium gloss for extrusion coating.
6. Finish: PPG Duranar Liquid Coatings
   Line: Micas Duranar “Sunstorm” Coatings (two-coat fluoro-polymer - base primer and second coat with mica pearlescent flakes)
   Color: Selected by Architect

C. Interior Finish:
   1. Standard: AAMA 2603.
   2. Thermosetting acrylic resin.
   3. Pre-treatment process: Manufacturer's standard.
   4. Factory applied, oven baked.
   5. Specular Gloss, ASTM D523:
      a. 8-80+ measured at 60 degree meter setting.
   6. Primer:
      a. Topcoat manufacturer's standard.
      b. DFT: 0.2 to 0.4 mils.
   7. Topcoat:
      a. One coat at all locations.
      b. Dry Film thickness (DFT): 1.0 mil +/- 0.2 with 0.8 mil minimum.
      c. Base Product: Duracron system by PPG.
   8. Color: TBD

2.5 FABRICATION

A. Coordinate major framing members and components and factory assemble into rectangular units and erect as complete system under single responsibility.
   1. To greatest extent possible, complete fabrication, assembly, finishing, sealing, glazing, hardware application, and other work prior to shipment.
   2. Form or extrude tubular and solid extruded aluminum mullions and horizontal rail shapes with sharp well-defined corners and flush sight lines. Back cutting of formed aluminum shapes is not required.
   3. Make joints neatly, tight fitting hairline joints with ends coped or mitered securely welded, fastened, or joined to develop full structural value of members.
   4. Complete cutting, remove arises, fitting, drilling, and grinding prior to cleaning, surface treatment, and application of finishes.
   5. Do not drill and tap for surface mounted hardware items until time of installation at project site.
   6. Mark components to identify location in Project according to Submittal (Shop) Drawings.
   7. Disassemble components only as necessary for shipment and installation.
   8. All components exposed in the finish work shall be free from warping, oil-canning effects. Also free from, the telegraphing of welds, studs and other fasteners, streaks, tool and die marks.

B. Provide internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within unitized aluminum curtain wall assembly to exterior.

C. Reinforce work as necessary for performance requirements, and for support to structure.

D. Provide interlocking stack joints on adjacent vertical grid frame members to allow expansion and contraction of frame units.

E. Fabricate with provision for thermal and mechanical movements of glazing and framing.
   1. Separate metal surfaces at moving joints, anchors and clips with plastic inserts or other non- abrasive concealed inserts.

F. Conceal fasteners, anchors, and connection devices from view to greatest extent possible.
   1. Use no bolts, screws or other hardware components, metallic fastenings that impair condensation resistance or specified U-values.

G. Weld by methods recommended by manufacturer and AWS standards.
   1. Avoid discoloration.
   2. Grind exposed welds smooth and restore mechanical finish.
   3. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

H. Provisions for field replacement of glazing from exterior for vision glass and exterior for spandrel glazing.

I. Fabricate and seal back pans to provide air seal.

J. Physical and thermal isolation of glazing from framing members.

K. Separate dissimilar metals with bituminous paint or preformed separators to prevent corrosion.

L. Fully degrease and clean members prior to assembly or application of sealing compounds or protective coatings.

M. Make joints exposed to weather watertight by welding, sealing, or both.
   1. Seal joints watertight unless otherwise indicated.

N. Tolerances for Manufacture:
   1. +/- 1/32 IN for extrusion fabrication or as necessary for fit and function.

O. Tolerances for Component Assembly:
   1. Assembly: The physical fitting together of any assembly of sub-elements shall be properly allowed for in the Detailed Design of the corresponding sub-elements.
   2. Curtain Wall Unit assembly:
      a. +/- 1/16 IN for overall unit assembly and +/- 1/8 IN for diagonal unit assembly check.
      b. Gap between removable members: Not more than 1/16 IN or not more than 1/32 IN at end of single member.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Comply with manufacturer's written instructions.
   2. Maintain accurate relation of planes and angles, with hairline fit of contacting members.
   3. Conceal joinery sealant.
   4. Rigidly secure non-movement joints.
   5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
   6. Seal joints, gaps, penetrations, buttered surfaces and other surfaces watertight unless otherwise indicated.
   7. Provide steel reinforcing, supports, braces, bolts, nuts, shims, and other components required to properly erect, align, and secure Work of this Section.
   8. Weld components in concealed locations to avoid distortion or discoloration of finish.

B. Protect glazing surfaces from welding.Installation Tolerances, conform to the following non-cumulative tolerances:
   1. Variation for Vertical Members: Not more than 1/4 IN in 25 FT.
   2. Variation for Horizontal Members: Not more than 1/4 IN in 25 FT.
   3. Limit offsets in end-to-end and edge-to-edge alignment:
      a. 1/16 IN where surfaces are flush or less than 1/2 IN out of flush and separated by not more than 2 IN.
      b. 1/8 IN for surfaces separated by more than 2 IN.
   4. Step in Face: 1/16 IN maximum.
   5. Jog in Alignment: 1/16 IN maximum.

6. Variations in Plane: One of the following.
    a. Not more than 1/8 IN in 10 FT at any location.
    b. Not more than 3/8 IN over entire face in any length of wall.

C. Install components plumb and true in alignment with established lines and grades, without warp or rack of framing members, doors, or panels.

D. Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

E. Use nylon or neoprene washers to allow thermal movement and at points of attachment to structure.

F. Install flashing and sealants within and at perimeter with splices and end dams for weathertight installation.

G. Glazing:
1. Glass shall be outside glazed.
2. Structural silicone glazed lites: Bond and seal glass to aluminum mullions with silicone adhesive.

H. Water Drainage:
1. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
2. Compartmentalize each light of glass using joint plugs and silicone sealant to divert water to horizontal weep locations.

3.2 FIELD QUALITY CONTROL

A. Quality Benchmarks: Provide Quality Benchmark installations of the first complete system erected on site to verify final selections made under sample submittals and mockups, to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Erect Initial Installation 2 stories high in stair-step fashion, minimum 2 bays wide at upper story.
    a. Initial Installation Quality Benchmark is intended to permit review of appearance, quality of workmanship, coordination, compatibility, and relationships with adjacent materials.
2. Install complete with glass, glazing, insulation, spandrels, anchors, panels and flashings other components required to create finished assembly.
3. Initial Installation Quality Benchmark shall be retained in place as permanent part of building as a standard for workmanship.
4. Protect the Quality Benchmark during construction.

B. Unitized Aluminum Curtain Wall Assemblies shall be considered defective if they do not pass tests and inspections.
1. Unit failure of a systemic nature determines status of units supplied to the project site.
2. Unit failure of a localized nature is not to be construed to reflect upon the units supplied for remainder of project.
3. Correct compromised unit and retest until tests reflect specified criteria.
4. Repair is only acceptable if repair samples are provided and confirmed, and guarantee offered by Contractor.

C. Testing Services:
   1. Owner will engage testing agency to perform field testing, see Section 01 4510
   2. Testing and inspect unitized aluminum curtain wall assemblies as installation proceeds to determine compliance with requirements.
   3. Prepare test and inspection reports.
   4. Water Spray Test:
      a. Conduct prior to installation of interior finishes in areas designated by Architect. Coordinate scheduling of test with Testing Agency approved by A/E and Contractor.
      b. Conform to AAMA 501.2, except as modified herein.
      c. Water passing through system constitutes failure requiring resolution.
      d. For each failure condition discovered, make corrective repairs and retest until the leakage is eliminated. Add an additional test for all failed tests at contractor expense. All failures shall be considered systemic failures requiring corrective work at all similar conditions. Remedial measures shall maintain standards of aesthetics, quality and durability and are subject to review by the Architect.
   5. Static Pressure Chamber Tests:
      a. Water penetration test:
         1) Conduct tests in accordance with ASTM E1105.
         2) No uncontrolled water leakage is permitted when tested at a static test pressure per Test Requirements in Part 2 above.
      b. For each failure condition discovered, make corrective repairs and retest until the leakage is eliminated. Add an additional test for all failed tests at contractor expense. All failures shall be considered systemic failures requiring corrective work at all similar conditions. Remedial measures shall maintain standards of aesthetics, quality and durability and are subject to review by the Architect.
   6. Sealant Adhesion Testing:
      a. Test sealant according to recommendations in ASTM C1521, Destructive Procedure, Method A.
         1) Test a minimum of 4 locations on each façade, unless additional testing is required by the manufacturer.
         2) Repair locations damaged by testing.
         3) Where Architect/Engineer determines that sealant has failed adhesively from testing or does not comply with requirements, additional testing shall be performed to determine extent of non-conforming sealant. Neatly cut out and remove non- conforming sealant, prepare and prime surfaces, and install new sealant. Perform field adhesion tests on new sealant. Additional testing and replacement of non-
            conforming sealant shall be at Contractor’s expense.
         4) Document testing with photographs and record results.
   7. Embedded Anchor Testing:
      a. Representatives of each anchor type embedded into concrete or reinforced masonry shall be field tested in accordance with ASTM E488 Test Method for Strength of Anchors in Concrete and Masonry Elements.
         1) Provide embeds for testing, approximately five (5) total.
      b. A minimum of 1 percent but no less than 5 anchors of each anchor type shall be tested.
      c. Each anchor type shall be tested for shear and tension combined to 1.5 times the design load.
      d. There shall be no failure or permanent deformation.

3.3 PROTECTION AND CLEANING

A. Adjust operating hardware to function properly and provide tight fit at contact points and weatherstripping.

B. Remove excess glazing and sealant compounds, dirt, and other substances from aluminum surfaces inside and out.

C. Remove excess compounds, dirt, and other substances from aluminum and adjacent surfaces.

D. Remove protective films as required by manufacturer's recommendations.

E. Institute protective measures, films and hard board on horizontal surfaces, and precautions required to protect work from damage or deterioration, other than normal weathering.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
4. Division 08 Section “All-Glass Entrances”.
5. Division 28 Section “Access Control Hardware Devices”.

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. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.

4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.
   h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 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. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through the Norton Preferred Installer (NPI) program.

Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.

F. 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.

G. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

H. 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.

I. 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

J. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 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".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 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.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

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. Hager Companies (HA) - AB Series, 3 knuckle.
b. McKinney (MK) - TA Series, 3 knuckle.

B. 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. Hager Companies (HA).
b. Pemko (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets with a 1-year warranty. 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. Hager Companies (HA) - ETW-QC (# wires) Option.
b. McKinney (MK) - QC (# wires) Option.

B. 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.

C. 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. Hager Companies (HA) - Quick Connect.
   b. McKinney (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

   a. Burns Manufacturing (BU).
   b. Rockwood (RO).

B. Coordinators: ANSI/BHMA A156.3 door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.

1. Manufacturers:

   a. Burns Manufacturing (BU).
   b. Rockwood (RO).

C. 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.

6. Manufacturers:

    a. Burns Manufacturing (BU).
    b. Hiawatha, Inc. (HI).
    c. Rockwood (RO).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.

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. Cylinders are to be factory keyed with owner having the ability for on-site original key cutting.

1. 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.

2. Manufacturers:

    a. Medeco (MC) - X4.
    b. Schlage (SC) - Everest 29 SL.
    c. Yale Commercial (YA) - Keymark.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. New System: Key locks to a new key system as directed by the Owner.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Three (3).
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

G. Construction Keying: Provide temporary keyed construction cores.

H. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 KEY CONTROL

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

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.7 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Heavy duty mortise locks shall have a ten-year warranty.

2. Mortise locks to be certified Security Grade 1.

3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 14.5 million cycles or greater.

4. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 16 million cycles or greater.

5. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 12.3 million cycles or greater.

6. Where specified, provide status indicators with highly reflective color and wording for "locked/unlocked" or "vacant/occupied" with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1" x 0.6" with a curved design allowing a 180-degree viewing angle with protective covering to prevent tampering.

7. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ML2000 Series.
    b. Sargent Manufacturing (SA) - 8200 Series.
    c. Yale Commercial (YA) - 8800FL Series H008 SPAR #07172.

2.8 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed, subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below and in the hardware sets.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, deadbolt monitoring, and request-to-exit signaling. Support end-of-line resistors contained within the lock case. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

3. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ML20900 Series.
    b. Sargent Manufacturing (SA) - 8200 Series.
    c. Yale Commercial (YA) - 8800FL Series H008 SPAR #07172.

2.9 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.10 ELECTRIC STRIKES

A. Standard Electric Strikes: Electric strikes conforming to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire rated openings. Strikes shall be of stainless steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of 1 million operating cycles. Provide strikes with 12 or 24 VDC capability, fail-secure unless otherwise specified. Where specified provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

1. Manufacturers:

a. HES (HS) - 1500/1600 Series.

2.11 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.

2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

10. Rail Sizing: Provide exit device rails factory sized for proper door width application.

11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

    1. Manufacturers:

        a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
        b. Sargent Manufacturing (SA) - 80 Series.
        c. Yale (YA) - 7000 Series H008 SPAR #07176.

C. Tubular Panic Devices: ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Device to be ADA compliant requiring less than 5 lbs. of force to activate. Post mounting with optional mechanical dogging. Provide proper fasteners as required by manufacturer to meet application requirements. Provide exit devices on both leaves of pairs of doors.

    1. Style: Exposed vertical rod. 1-1/4” grip diameter with interior operating panic handle in combination with exterior fixed pull handle. Panic mechanism shall be concealed within brass or stainless steel tubing. Optional entrance from exterior by a keyed cylinder.
    2. Configurations (provide as specified):

        a. Half Height Straight Pull.

    3. Push/pull operation when dogged from the inside.
    4. Latching: Top latching. Reversed, flat, Pullman style. Roller-type latching not acceptable.
    5. Engraved "PUSH" signage with optional paint infill and boundary grooves.

6. Manufacturers:

    a. Rockwood (RO) - PDU8500 Series.

2.12 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

1. Energy Efficient Design: Provide devices which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

2. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.

3. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

4. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED5000 Series.
    b. Sargent Manufacturing (SA) - 80 Series.
    c. Yale (YA) - 7000 Series H008 SPAR #07176.

2.13 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 (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.
c. Yale Commercial (YA) - Unitrol Series.

C. Door Closers, Surface Mounted (Cam Action): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, high efficiency 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 of the cam and roller design, one piece cast aluminum silicon alloy body with adjustable backcheck and independently controlled valves for closing sweep and latch speed.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) – DC5000 Series .
b. Norton Rixson (NO) - 2800ST Series.
c. Sargent Manufacturing (SA) - 422 Series.

D. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, 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, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC6000 Series.
b. Sargent Manufacturing (SA) - 1431 Series.
c. Yale Commercial (YA) - 3500 Series.

2.14 ELECTROHYDRAULIC DOOR OPERATORS

A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.

1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.

B. Standard: Conforming to ANSI/BHMA A156.19.

C. Performance Requirements:

1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.

D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.

E. Certification: Furnish Operators with Green Circle Certification.

F. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.

G. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.

H. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.

I. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.

J. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Norton Rixson (NO) - 6000 Series.

2.15 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. Burns Manufacturing (BU).
    b. Hiawatha, Inc. (HI).
    c. Rockwood (RO).

2.16 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. Burns Manufacturing (BU).
    b. Hiawatha, Inc. (HI).
    c. Rockwood (RO).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Norton Rixson (RF).
    b. Rockwood (RO).
    c. Sargent Manufacturing (SA).

2.17 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 NPFA 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. Reese Enterprises, Inc. (RE).

2.18 ELECTRONIC ACCESSORIES

A. Request-to-Exit Motion Sensor: Request-to-Exit Sensors motion detectors specifically designed for detecting exiting through a door from the secure area to a non-secure area. Include built-in timers (up to 60 second adjustable timing), door monitor with sounder alert, internal vertical pointability coverage, 12VDC or 24VDC power and selectable relay trigger with fail safe/fail secure modes.

1. Manufacturers:

a. Alarm Controls (AK) - SREX Series.
b. Securitron (SU) - XMS Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

    a. Sargent Manufacturing (SA) - 3280 Series.
    b. Securitron (SU) - DPS Series.

C. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.

    1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

    2. Manufacturers:

        a. Securitron (SU) - AQD Series.

2.19 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.

2.20 FINISHES

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

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. 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. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 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.

3.5 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.

3.6 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.7 DOOR HARDWARE SETS

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

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer’s Abbreviations:
   1. GS - ASSA ABLOY Glass Solutions
   2. MK - McKinney
   3. PE - Pemko
   4. RF - Rixson
   5. RO - Rockwood
   6. YA - Yale
   7. HS - HES
   8. NO - Norton

9. OT - Other
10. SU - Securitron

Hardware Sets

Set: 1.0
Doors: 0110A, 0110B, 1309A, C25.2A
Description: Ext - Alum Pair - CVR/NL-ELR - Card Reader - Auto Operator

2	Continuous Hinge	GFM__SLF-HD1 SERxx		PE 087100
1	CVR Exit, Exit Only	7220 B S MELR EO	606	YA 087100
1	CVR Exit, Nightlatch	7220 B S MELR 121NL K620	606	YA 087100
2	Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO 087100
2	Conc Overhead Stop	1-336 606	RF	087100
2	Automatic Opener	6000 Series	696	NO 087100
1	Threshold	252x2AFG MS25SS		PE 087100
2	Sweep	315CN PE	087100	
2	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
2	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
2	Touchless Switch (Microwave)	673 NO	087113	
2	Switch Post	500 689	NO	087100
1	Power Supply	AQD6 SU	087100	

Notes:
Weatherstripping by Alum Door manufacturer

Card Reader, wiring and connections by security provider.

Doors electrically locked after hours, card reader access with intercom on exterior.

Set: 2.0
Doors: 1550A
Description: Ext - Alum Pair - Rim/NL- ELR - Card Reader - KRM - Closer/stop

2	Continuous Hinge	GFM__SLF-HD1 SERxx		PE 087100
1	Mullion	KRM200 696	YA	087100
1	Rim Exit, Exit Only	7100 B S MELR EO	606	YA 087100
1	Rim Exit, Nightlatch	7100 B S MELR 121NL K620	606	YA 087100
1	Mortise Cylinder	K620 606	YA	087100
2	Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO 087100
2	Surface Closer	UNI3301 696	YA	087100
1	Threshold	252x2AFG MS25SS		PE 087100
1	Mullion Gasketing	5110BL PE	087100	
2	Sweep	315CN PE	087100	

2 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
2 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD6 SU	087100		

Notes:
Weatherstripping by Alum Door manufacturer

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 3.0
Doors: 3124B
Description: Ext - Alum Pair - FSE Lock - RX - Card Reader - Closer/stop

1 Continuous Hinge	GFM__SLF-HD1		PE	087100
1 Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
2 Flush Bolt	555 US26D	RO	087100	
1 Fail Safe Lock	H008 8890FL K620 REX	606	YA	087100
2 Surface Closer	UNI3301 696	YA	087100	
1 Threshold	252x2AFG MS25SS		PE	087100
2 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Weatherstripping by Alum Door manufacturer

Card Reader, wiring and connections by security provider.

Doors electrically locked after hours, card reader access on exterior.

Set: 4.0
Doors: 2100A
Description: Ext - Alum Sgl - Rim/NL-ELR - Card Reader - Auto Operator

1 Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1 Rim Exit, Nightlatch	7100 B S MELR 121NL K620	606	YA	087100
1 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO	087100
1 Conc Overhead Stop	1-336 606	RF	087100	
1 Automatic Opener	6000 Series	696	NO	087100
1 Threshold	252x2AFG MS25SS		PE	087100
1 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100

1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
2 Touchless Switch (Microwave)	673 NO	087113		
2 Switch Post	500 689	NO	087100	
1 Power Supply	AQD6 SU	087100		

Notes:
Weatherstripping by Alum Door manufacturer

Card Reader, wiring and connections by security provider.

Doors electrically locked after hours, card reader access on exterior.

Set: 5.0
Doors: 1322B, 1603A, 3308B, 3508B
Description: Ext - Alum Sgl - Rim/NL-ELR - Card Reader - Closer/stop

1 Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1 Rim Exit, Nightlatch	7100 B S MELR 121NL K620	606	YA	087100
1 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO	087100
1 Surface Closer	UNI3301 696	YA	087100	
1 Threshold	252x2AFG MS25SS		PE	087100
1 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD6 SU	087100		

Notes:
Weatherstripping by Alum Door manufacturer

Card Reader, wiring and connections by security provider.

Doors electrically locked after hours, card reader access on exterior.

Set: 6.0
Doors: 0103A
Description: Ext - Alum Sgl - FSE Lock - RX - Elec Strk - Card Reader - Auto Operator

1 Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Electric Strike	1500C-DLMS	606	HS	087100
1 Automatic Opener	6000 Series	696	NO	087100
1 Threshold	252x2AFG MS25SS		PE	087100
1 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100

1	Touchless Switch (Microwave)	673	NO	087113	
1	Switch Post	500	689	NO	087100
1	Power Supply	AQD1	SU	087100	

Notes:
Weatherstripping by Alum Door manufacturer

Card Reader, wiring and connections by security provider.

Doors electrically locked after hours, card reader access on exterior.

Set: 7.0
Doors: 1528B, 3124A, 4116A, 4116B
Description: Ext - Alum Sgl - FSE Lock - RX - Card Reader - Closer/stop

1	Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1	Surface Closer	UNI3301 696	YA	087100	
1	Threshold	252x2AFG MS25SS		PE	087100
1	Sweep	315CN PE	087100		
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1	ElectroLynx Harness	QC-C1500P		MK	087100
1	Card Reader	By security provider		OT	
1	Position Switch	DPS-M-BK		SU	087100
1	Power Supply	AQD1 SU	087100		

Notes:
Weatherstripping by Alum Door manufacturer

Card Reader, wiring and connections by security provider.

Doors electrically locked after hours, card reader access on exterior.

Set: 8.0
Doors: ST1.1B
Description: Ext - Alum Sgl - Rim/FSE - RX - Card Reader - Closer/stop

1	Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1	Rim Exit, Fail Secure	7100 B S H008 691F K600	606	YA	087100
1	Surface Closer	UNI3301 696	YA	087100	
1	Threshold	252x2AFG MS25SS		PE	087100
1	Sweep	315CN PE	087100		
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1	ElectroLynx Harness	QC-C1500P		MK	087100
1	Card Reader	By security provider		OT	
1	Position Switch	DPS-M-BK		SU	087100
1	Power Supply	AQD1 SU	087100		

Notes:
Weatherstripping by Door manufacturer.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 9.0
Doors: ST3.1B
Description: Ext - Alum Sgl - Rim/EO - Closer/stop

1 Continuous Hinge	GFM__SLF-HD1		PE 087100
1 Rim Exit, Exit Only	7100 EO 606	YA	087100
1 Surface Closer	UNI3301 696	YA	087100
1 Threshold	252x2AFG MS25SS		PE 087100
1 Sweep	315CN PE	087100	

Notes:
Weatherstripping by Door manufacturer.

Set: 10.0
Doors: 1309B
Description: Vestibule - Alum Pair - Push/Pull - Auto Operator

2 Continuous Hinge	GFM__SLF-HD1		PE 087100
2 Push Bar	RM3112 Mtg-Type 12XHD	US4	RO 087100
2 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO 087100
2 Automatic Opener	6000 Series	696	NO 087100
2 Touchless Switch (Microwave)	673 NO	087113	
2 Switch Post	500 689	NO	087100

Set: 11.0
Doors: 1550B
Description: Vestibule - Alum Pair - Push/Pull - Closer/stop

2 Continuous Hinge	GFM__SLF-HD1		PE 087100
2 Push Bar	RM3112 Mtg-Type 12XHD	US4	RO 087100
2 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO 087100
2 Surface Closer	UNI3301 696	YA	087100

Set: 12.0
Doors: 1322A, 1603B
Description: Vestibule - Alum Sgl - Push/Pull - Closer/stop

1 Continuous Hinge	GFM__SLF-HD1		PE 087100
1 Push Bar	RM3112 Mtg-Type 12XHD	US4	RO 087100
1 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO 087100
1 Surface Closer	UNI3301 696	YA	087100

Set: 13.0
Doors: 1100A, 1600A
Description: Ext - Pair - Glass - Panic/NL - Elec Strk - Card Reader - Auto Operator

2 Solid Header	HDS-1750x4000	4E	GS	084126
2 Top Rail/Patch	DRT - 275BD-T	US32D	GS	084126
2 Bottom Rail/Patch	DRT - 275BD-B	US32D	GS	084126
2 Pivot	PF-ADJ-PIVOT	US4	GS	084126
2 Bottom Pivot	PV-FM-300END	US4	GS	084126
2 Exit Device	PDU8000-3	4E	GS	084126
2 Mortise Cylinder	K620 606	YA	087100	
1 Electric Strike	ESK-1600-DBL AC-RECTIFIER	4E	GS	084126
2 Automatic Opener	6000 Series	696	NO	087100
2 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Threshold	252x2AFG MS25SS		PE	087100
2 Sweep	315CN PE	087100		
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Motion Sensor	XMS SU	087100		
2 Touchless Switch (Microwave)	673 NO	087113		
2 Switch Post	500 689	NO	087100	

Notes:
Weatherstripping by Door manufacturer.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 14.0
Doors: 4000A
Description: Ext - Pair - Glass - Panic/NL - Elec Strk - Card Reader - OH Conc Closer

2 Solid Header	HDS-1750x4000	4E	GS	084126
2 Top Rail/Patch	DRT - 275BD-T	US32D	GS	084126
2 Bottom Rail/Patch	DRT - 275BD-B	US32D	GS	084126
2 Pivot	PF-ADJ-PIVOT	US4	GS	084126
2 Bottom Pivot	PV-FM-300END	US4	GS	084126
2 Exit Device	PDU8000-3	4E	GS	084126
2 Mortise Cylinder	K620 606	YA	087100	
1 Electric Strike	ESK-1600-DBL AC-RECTIFIER	4E	GS	084126
2 Concealed Closer	OHC-609-105HO		GS	084126
2 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Threshold	252x2AFG MS25SS		PE	087100
2 Sweep	315CN PE	087100		
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Motion Sensor	XMS SU	087100		

Notes:
Weatherstripping by Door manufacturer.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 15.0
Doors: 0104A, 0105A, 0112A, 0114A, 0122A, 0122B, 0124A, 0124B, 0124C, 0126A, 1556A
Description: Ext - Pair - FSE Lock - RX - MFB - Card Reader - Closer/stop

1 Continuous Hinge	GFM__HD1		PE 087100
1 Continuous Hinge	GFM__HD1 SERxx		PE 087100
2 Flush Bolt	555 / 557 US4	RO	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1 Surf Overhead Stop	9-336 606	RF	087100
1 Surface Closer	UNI3301 696	YA	087100
1 Threshold	273x292AFGPK MS25SS		PE 087100
2 Sweep	315CN PE	087100	
1 Astragal	S771D PE	087100	
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1 ElectroLynx Harness	QC-C1500P		MK 087100
2 Position Switch	DPS-M-BK		SU 087100
1 Power Supply	AQD1 SU	087100	

Notes:
Hollow metal frame manufacturer to provide weather stripping in the Thermal Break frame.

Closer on active leaf, OH Stop on inactive leaf only.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 16.0
Doors: 0102C, 0116B, 1552A
Description: Ext - Pair - Storeroom - MFB - Closer/stop

2 Continuous Hinge	GFM__HD1		PE 087100
2 Flush Bolt	555 / 557 US4	RO	087100
1 Storeroom or Closet Lock	H008 8805FL K620	606	YA 087100
1 Surf Overhead Stop	9-336 606	RF	087100
1 Surface Closer	3321 696	YA	087100
1 Threshold	252x2AFG MS25SS		PE 087100
1 Rain Guard	346C PE	087100	
2 Sweep	315CN PE	087100	
1 Astragal	3572SP PE	087100	

Notes:
Hollow metal frame manufacturer to provide weather stripping in the Thermal Break frame.

Set: 17.0
Doors: ST2.0, ST2.10, ST3.0
Description: Sgl - FSE Lock - Card Reader - Closer/stop

1 Continuous Hinge	GFM__HD1 SERxx		PE	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Surface Closer	2800ST 696	NO	087100	
1 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Threshold	273x292AFGPK MS25SS		PE	087100
1 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Hollow metal frame manufacturer to provide weather stripping in the Thermal Break frame.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 18.0
Doors: 0104B, 0116A, 0119, 0120A, 2208B
Description: Ext - Sgl - FSE Lock - Card Reader - Closer/stop

1 Continuous Hinge	GFM__HD1 SERxx		PE	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Surface Closer	UNI3301 696	YA	087100	
1 Threshold	273x292AFGPK MS25SS		PE	087100
1 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Hollow metal frame manufacturer to provide weather stripping in the Thermal Break frame.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 19.0
Doors: 0102A, 0102B
Description: Sgl - Rim/FSE - Card Reader - Closer/stop - KP

1 Continuous Hinge	GFM__HD1 SERxx		PE	087100
1 Rim Exit, Fail Secure	7100 B S H008 691F K600	606	YA	087100
1 Surface Closer	UNI3301 696	YA	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100

1 Threshold	273x292AFGPK MS25SS		PE	087100
1 Sweep	315CN PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Hollow metal frame manufacturer to provide weather stripping in the Thermal Break frame.

Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 20.0
Doors: 3308A
Description: Alum Pair - CVR/NL-ELR - Card Reader - Closer/stop

2 Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1 CVR Exit, Exit Only	7220 B S MELR EO	606	YA	087100
1 CVR Exit, Nightlatch	7220 B S MELR 121NL K620	606	YA	087100
2 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO	087100
2 Surface Closer	UNI3301 696	YA	087100	
2 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
2 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD6 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 21.0
Doors: 1600C
Description: Alum Sgl - Rim/NL- ELR - Card Reader - Closer

1 Continuous Hinge	GFM__SLF-HD1 SERxx		PE	087100
1 Rim Exit, Nightlatch	7100 B S MELR 121NL K620	606	YA	087100
1 Offset Door Pull	RM3311-60 Mtg-Type 12XHD	US4	RO	087100
1 Surface Closer	3301 696	YA	087100	
1 W/F Stop	RM867 / RM857	BSP	RO	087100
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Power Supply	AQD6 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 22.0
Doors: 1100B, 1600B
Description: Pair Glass - Push/Pull - Auto Operator

2	Top Rail/Patch	DRT - 275BD-T	US32D	GS 084126
2	Bottom Rail/Patch	DRT - 275BD-B	US32D	GS 084126
2	Stop	60131 606	RF	087100
2	Pivot	PV-WALKBEAM	4E	GS 084126
2	Bottom Pivot	PV-FM-300END	US4	GS 084126
2	Straight Door Pull	RM3301-60 Mtg-Type 14XHD	US4	RO 087100
2	Automatic Opener	6000 Series	696	NO 087100
2	Touchless Switch (Microwave)	673 NO	087113	
2	Switch Post	500 689	NO	087100

Notes:
Balance of hardware by glass door supplier.

Set: 23.0
Doors: 1214A
Description: Pair - FSE Lock - RX - Card Reader - AFB - Closer

7	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Automatic Flush Bolt	2842/2942	US4	RO 087100
1	Dust Proof Strike	570 US4	RO	087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
2	Surface Closer	2800STH 696	NO	087100
2	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
2	W/F Stop	RM867 / RM857	BSP	RO 087100
2	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 24.0
Doors: 1532A, 1534A, 1536A, 2208A
Description: Pair - FSE Lock - RX - Card Reader - MFB - Closer/stop

5	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
2	Flush Bolt	555 / 557 US4	RO	087100
1	Dust Proof Strike	570 US4	RO	087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
2	Surface Closer	3321 696	YA	087100
1	Gasketing Pair	S773BL PE	087100	
1	Astragal	S771D PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 25.0
Doors: 1207A, 1310C, 1406A, 2514A, 4100A
Description: Pair - FSE Lock - RX - Card Reader - MFB - Closer/stop

7	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Flush Bolt	555 / 557 US4	RO	087100
1	Dust Proof Strike	570 US4	RO	087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
2	Surface Closer	3321 696	YA	087100
1	Gasketing Pair	S773BL PE	087100	
1	Astragal	S771D PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 26.0
Doors: 2504A
Description: Pair - SVR/FSE - Card Reader - Closer/stop

8	Hinge	BY DOOR SUPPLIER	US4	
2	SVR Exit, Fail Safe	7110F B S H008 690F K600	606	YA 087100
2	Surface Closer	3321 696	YA	087100
2	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100

1 Gasketing Pair	S773BL PE	087100		
1 Astragal	S771D PE	087100		
2 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
2 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 27.0
Doors: 4200A, C22.2B
Description: Pair - FSE Lock - RX - Card Reader - Closer

7 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Self Latching Flush Bolt	2845/2945	US4	RO	087100
1 Dust Proof Strike	570 US4	RO	087100	
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Coordinator	2672 4E	RO	087100	
2 Surface Closer	2800ST 696	NO	087100	
2 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
2 W/F Stop	RM867 / RM857	BSP	RO	087100
2 Silencer - Metal Frame	608 RO	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 28.0
Doors: 2404A
Description: Pair - FSE Lock - RX - Card Reader - Closer/stop

8 Hinge	BY DOOR SUPPLIER	US4		
1 Self Latching Flush Bolt	2845/2945	US4	RO	087100
1 Dust Proof Strike	570 US4	RO	087100	
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Surf Overhead Stop	10-336 606	RF	087100	
1 Surface Closer	2800ST 696	NO	087100	
2 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100

2	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 29.0
Doors: 1106A, 3008A, 4006A, C22.2A
Description: Pair - FSE Lock - RX - Card Reader - Closer/stop

8	Hinge	BY DOOR SUPPLIER	US4	
1	Self Latching Flush Bolt	2845/2945	US4	RO 087100
1	Dust Proof Strike	570 US4	RO	087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surf Overhead Stop	10-336 606	RF	087100
1	Surface Closer	3321 696	YA	087100
2	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
2	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 30.0
Doors: 1206A, 1208A
Description: Pair - FSE Lock - RX - Card Reader - Closer - Sound Seals

7	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Self Latching Flush Bolt	2845/2945	US4	RO 087100
1	Dust Proof Strike	570 US4	RO	087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surf Overhead Stop	10-336 606	RF	087100
1	Surface Closer	3321 696	YA	087100
1	Gasketing Pair	S773BL PE	087100	
1	Gasketing	303AS PE	087100	
2	Door Bottom	STC4131CPK		PE 087100
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100

1 ElectroLynx Harness	QC-C1500P		MK	087100
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 31.0
Doors: 1400A, C16.6A
Description: Pair - SVR/FSE - Card Reader - Closer/stop

8 Hinge	BY DOOR SUPPLIER	US4		
2 SVR Exit, Fail Safe	7110 B S H008 690F K600	606	YA	087100
2 Surface Closer	3321 696	YA	087100	
2 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
2 Silencer - Metal Frame	608 RO	087100		
2 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
2 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 32.0
Doors: 2306A, 2316A, 3310A, C12.1A, C22.2B, C31.7A, C41.6A
Description: Pair - SVR/FS - Card Reader - Closer/stop

6 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
2 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
2 SVR Exit, Fail Safe	7110 B S H008 690F K600	606	YA	087100
2 Surface Closer	3321 696	YA	087100	
2 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
2 Silencer - Metal Frame	608 RO	087100		
2 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
2 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 33.0
Doors: C12.1B
Description: Pair - SVR/FS - Card Reader - Closer/stop

8	Hinge	BY DOOR SUPPLIER	US4	
2	SVR Exit, Fail Safe	7110 B S H008 690F K600	606	YA 087100
2	Surface Closer	3321 696	YA	087100
2	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
2	Silencer - Metal Frame	608 RO	087100	
2	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
2	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 34.0
Doors: 3400A
Description: Pair - SVR/FS - Card Reader - Closer/stop - Sound Seals

6	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
2	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
2	SVR Exit, Fail Safe	7110 B S H008 690F K600	606	YA 087100
2	Surface Closer	3321 696	YA	087100
1	Gasketing Pair	S773BL PE	087100	
1	Gasketing	303AS PE	087100	
2	Door Bottom	STC4131CPK		PE 087100
2	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
2	ElectroLynx Harness	QC-C1500P		MK 087100
2	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 35.0
Doors: 2400A, 2400B, 2410A, 2410B
Description: Pair - SVR/FS - Card Reader - Closer/stop

8	Hinge	BY DOOR SUPPLIER	US4	
2	SVR Exit, Fail Safe	7110 B S H008 690F A640 2-1/4" Thick	606 YA	087100
2	Surface Closer	3321 696	YA	087100
2	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
2	Silencer - Metal Frame	608 RO	087100	

2 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
2 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
2 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 36.0
Doors: 2400C, 2400D, 2410C, 2410D
Description: Pair - SVR/Passage - Closer/stop - KP - Sound Seals

8 Hinge	BY DOOR SUPPLIER	US4		
2 SVR Exit, Passage	7110F H008 628F	606	YA	087100
2 Surface Closer	3321 696	YA	087100	
2 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 Gasketing Pair	S773BL PE	087100		
1 Gasketing	303AS PE	087100		
2 Door Bottom	STC4131CPK		PE	087100
1 Astragal	S771D PE	087100		

Set: 37.0
Doors: 3200A
Description: Pair - Office - MFB - Closer/stop - Sound Seals

8 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
2 Flush Bolt	555 / 557 US4	RO	087100	
1 Dust Proof Strike	570 US4	RO	087100	
1 Entry Lock	H008 8807FL K620	606	YA	087100
1 Surface Closer	3321 696	YA	087100	
2 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Gasketing Pair	S773BL PE	087100		
1 Gasketing	303AS PE	087100		
2 Door Bottom	STC4131CPK		PE	087100
1 Astragal	S771D PE	087100		

Set: 38.0
Doors: ST1.1
Description: Sgl - FS Lock - RX - Card Reader - Closer - KP

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Fail Safe Lock	H008 8890FL K620 REX	606	YA	087100
1 Surface Closer	2800ST 696	NO	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Gasketing Sgl	S773BL PE	087100		

1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 39.0
Doors: 1313A
Description: Sgl - FSE Lock - RX - Card Reader - Closer - KP

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Surface Closer	2800ST 696	NO	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Gasketing Sgl	S773BL PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 40.0
Doors: 1506A, 4102A, 4104A
Description: Sgl - FSE Lock - RX - Card Reader - Closer/stop

2 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Surface Closer	3321 696	YA	087100	
1 Gasketing Sgl	S773BL PE	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 41.0
Doors: 1120A, 1202A, 1204A, 1624A, 3218A
Description: Sgl - FSE Lock - RX - Card Reader - Closer/stop

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1 Surface Closer	3321 696	YA	087100
1 Gasketing Sgl	S773BL PE	087100	
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1 ElectroLynx Harness	QC-C1500P		MK 087100
1 Card Reader	By security provider		OT
1 Position Switch	DPS-M-BK		SU 087100
1 Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 42.0
Doors: ST1.3, ST2.4, ST3.1, ST3.2, ST3.3, ST3.4
Description: Sgl - Rim/FS Trim - Card Reader - Closer - KP

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1 Rim Exit, Fail Safe	7100F B S H008 690F K600	626	YA 087100
1 Surface Closer	2800ST 696	NO	087100
1 Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1 W/F Stop	RM867 / RM857	BSP	RO 087100
1 Gasketing Sgl	S773BL PE	087100	
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1 ElectroLynx Harness	QC-C1500P		MK 087100
1 Card Reader	By security provider		OT
1 Position Switch	DPS-M-BK		SU 087100
1 Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 43.0
Doors: ST2.3
Description: Sgl - Rim/FS Trim - Card Reader - Closer - KP

3 Hinge, Full Mortise, Hvy Wt	TA786 FT 5" x 4-1/2"	US4	MK 087100
1 Hinge, Full Mortise, Hvy Wt	TA786 QCxx FT 5" x 4-1/2"	US4	MK 087100
1 Rim Exit, Fail Safe	7100F B S H008 690F K600	626	YA 087100

1	Surface Closer	2800ST 696	NO	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
1	Gasketing Sgl	S773BL PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 44.0
Doors: 2504B, 4002LLLL
Description: Sgl - Rim/FS Trim - Card Reader - Closer - KP

4	Hinge	BY DOOR SUPPLIER	US4	
1	Rim Exit, Fail Safe	7100F B S H008 690F K600	626	YA 087100
1	Surface Closer	3321 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	Gasketing Sgl	S773BL PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 45.0
Doors: 3300A
Description: Sgl - Rim/FS Trim - Card Reader - Closer/stop

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Rim Exit, Fail Safe	7100F B S H008 690F K600	626	YA 087100
1	Surface Closer	3321 696	YA	087100
1	Gasketing Sgl	S773BL PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 46.0
Doors: C34.4A
Description: Sgl - Rim/FS Trim - Card Reader - Closer/stop - Sound Seals

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Rim Exit, Fail Safe	7100F B S H008 690F K600	626	YA 087100
1	Surface Closer	3321 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	Gasketing Sgl	S773BL PE	087100	
1	Gasketing	303AS PE	087100	
1	Door Bottom	STC4131CPK		PE 087100
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 47.0
Doors: 2500A, 3100A, 3502A
Description: Sgl - Rim/FSE Trim - Card Reader - Closer/stop

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Rim Exit, Fail Secure	7100F B S H008 691F K600	606	YA 087100
1	Surface Closer	3321 696	YA	087100
1	Gasketing Sgl	S773BL PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 48.0
Doors: 2206A, 3302A
Description: Sgl - Rim/FS Trim - Card Reader - Closer/stop

4	Hinge	BY DOOR SUPPLIER	US4	
1	Rim Exit, Fail Secure	7100 B S H008 691F K600	606	YA 087100
1	Surface Closer	3321 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	Gasketing Sgl	S773BL PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 49.0
Doors: 3150G, C16.4B, C16.6B
Description: Sgl - FS Lock - RX - Card Reader - Closer

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Safe Lock	H008 8890FL K620 REX	606	YA 087100
1	Surface Closer	3301 696	YA	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 50.0
Doors: 1636A, 1636B
Description: Sgl - FS Lock - RX - Card Reader - Closer

4	Hinge	BY DOOR SUPPLIER	US4	
1	Fail Safe Lock	H008 8890FL K620 REX	606	YA 087100
1	Surface Closer	2800ST 696	NO	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100

1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 51.0
Doors: 1314A, 1628A, 1634A, 4142B
Description: Sgl - FS Lock - RX - Card Reader - Closer - Sound Seal

4	Hinge	BY DOOR SUPPLIER	US4	
1	Fail Safe Lock	H008 8890FL K620 REX	606	YA 087100
1	Surface Closer	2800ST 696	NO	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
1	Gasketing Sgl	S773BL PE	087100	
1	Gasketing	303AS PE	087100	
1	Door Bottom	STC4131CPK		PE 087100
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 52.0
Doors: 3010A
Description: Sgl - FS Lock - RX - Card Reader - Closer/stop

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Safe Lock	H008 8890FL K620 REX	606	YA 087100
1	Surface Closer	3321 696	YA	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 53.0

Doors: 1410A, 1410B, 3200C, C32.1A, C32.2A
Description: Sgl - FS Lock - RX - Card Reader - Closer/stop - Sound Seals

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Safe Lock	H008 8890FL K620 REX	606	YA 087100
1	Surface Closer	3321 696	YA	087100
1	Gasketing Sgl	S773BL PE	087100	
1	Gasketing	303AS PE	087100	
1	Door Bottom	STC4131CPK		PE 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 54.0
Doors: 1112A
Description: Sgl - FSE Lock - RX - Card Reader - Closer

4	Hinge	BY DOOR SUPPLIER	US4	
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surface Closer	2800ST 696	NO	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
1	Gasketing Pair	S773BL PE	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 55.0
Doors: 1522A, 1528A, 1538A, 1540A, 1542A, 1542B
Description: Sgl - FSE Lock - RX - Card Reader - Closer

2	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surface Closer	2800ST 696	NO	087100

1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 56.0
Doors: 1104A, 1201A, 1216A, 1226A, 1228A, 1502A, 1610A, 1616A, 1678A
Description: Sgl - FSE Lock - RX - Card Reader - Closer

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surface Closer	2800ST 696	NO	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Card Reader	By security provider		OT
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 57.0
Doors: 1400B, 1672A, 2106A, 2402A, 2412A, 3102A, 4002CCC, C15.1A, C31.1A
Description: Sgl - FSE Lock - RX - Card Reader - Closer - KP

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surface Closer	3301 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 58.0
Doors: 1232A, 1616B, 1672B
Description: Sgl - FSE Lock - RX - Card Reader - Closer

3	Hinge, Full Mortise, Hvy Wt	TA786 FT 5" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise, Hvy Wt	TA786 QCxx FT 5" x 4-1/2"	US4	MK 087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surface Closer	3301 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 59.0
Doors: 1532B, 1622A, 2219A, 2502A, 3104A, 3316A, 3504A, 3506A
Description: Sgl - FSE Lock - RX - Card Reader - Closer/stop

3	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Fail Secure Lock	H008 8891FL K620 REX	606	YA 087100
1	Surface Closer	3321 696	YA	087100
3	Silencer - Metal Frame	608 RO	087100	
1	ElectroLynx Harness	QC-Cxxx sized for door width		MK 087100
1	ElectroLynx Harness	QC-C1500P		MK 087100
1	Position Switch	DPS-M-BK		SU 087100
1	Power Supply	AQD1 SU	087100	

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 60.0
Doors: 1602A, 2414A
Description: Sgl - FSE Lock - RX - Card Reader - Closer/stop

3	Hinge, Full Mortise, Hvy Wt	TA786 FT 5" x 4-1/2"	US4	MK 087100

1 Hinge, Full Mortise, Hvy Wt	TA786 QCxx FT 5" x 4-1/2"	US4	MK	087100
1 Fail Secure Lock	H008 8891FL K620 REX	606	YA	087100
1 Surface Closer	3321 696	YA	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
3 Silencer - Metal Frame	608 RO	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 61.0
Doors: C16.4A
Description: Sgl - Rim/FS Trim - Card Reader - Closer - KP

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Rim Exit, Fail Safe	7100 B S H008 690F K600	606	YA	087100
1 Surface Closer	2800ST 696	NO	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
3 Silencer - Metal Frame	608 RO	087100		
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Card Reader	By security provider		OT	
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 62.0
Doors: C33.1A
Description: Sgl - Rim/FS - Card Reader - Closer/stop - Sound Seals

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise	TA714 QCxx FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Rim Exit, Fail Safe	7100 B S H008 690F K600	606	YA	087100
1 Surface Closer	3321 696	YA	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 Gasketing Sgl	S773BL PE	087100		
1 Gasketing	303AS PE	087100		
1 Door Bottom	STC4131CPK		PE	087100

1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 63.0
Doors: 1210A, 1212A, 1218A, 1220A
Description: Sgl - Rim/FS - Card Reader - Closer/stop - Sound Seals

3 Hinge, Full Mortise, Hvy Wt	TA786 FT 5" x 4-1/2"	US4	MK	087100
1 Hinge, Full Mortise, Hvy Wt	TA786 QCxx FT 5" x 4-1/2"	US4	MK	087100
1 Rim Exit, Fail Safe	7100 B S H008 690F K600	606	YA	087100
1 Surface Closer	3321 696	YA	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 Gasketing Sgl	S773BL PE	087100		
1 Gasketing	303AS PE	087100		
1 Door Bottom	STC4131CPK		PE	087100
1 ElectroLynx Harness	QC-Cxxx sized for door width		MK	087100
1 ElectroLynx Harness	QC-C1500P		MK	087100
1 Position Switch	DPS-M-BK		SU	087100
1 Power Supply	AQD1 SU	087100		

Notes:
Coordinate voltage, operation and electrical characteristics with all related trades.

Card Reader, wiring and connections by security provider.

Set: 64.0
Doors: ST2.1, ST2.2
Description: Sgl - Rim/Passage - Closer - KP

4 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Rim Exit, Passage	7100F H008 628F	606	YA	087100
1 Surface Closer	3301 696	YA	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Gasketing Sgl	S773BL PE	087100		

Set: 65.0
Doors: ST2.1B
Description: Sgl - Passage - Closer/stop - KP

3 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Passage Latch	H008 8801FL	606	YA	087100
1 Surface Closer	3321 696	YA	087100	

1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	Gasketing Sgl	S773BL PE	087100	

Set: 66.0
Doors: 2306C
Description: Sgl - Rim/EO - Closer

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Rim Exit, Exit Only	7100 EO 606	YA	087100
1	Surface Closer	3321 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 67.0
Doors: 1680A
Description: Sgl - Storeroom - Closer

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Storeroom or Closet Lock	H008 8805FL K620	606	YA 087100
1	Surface Closer	3301 696	YA	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 68.0
Doors: C15.3A
Description: Sgl - Storeroom - Closer - KP

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Storeroom or Closet Lock	H008 8805FL K620	606	YA 087100
1	Surface Closer	3301 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 69.0
Doors: 2306B, 3306A
Description: Sgl - Storage - OH Stop

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Storeroom or Closet Lock	H008 8805FL K620	606	YA 087100
1	Surf Overhead Stop	10-336 606	RF	087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 70.0
Doors: 3304A
Description: Sgl - Office - Closer - KP

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Entry Lock	H008 8807FL K620	606	YA 087100
1	Surface Closer	3301 696	YA	087100

1	Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1	W/F Stop	RM867 / RM857	BSP	RO	087100
3	Silencer - Metal Frame	608 RO	087100		

Set: 71.0
Description: Sgl - Office - Closer/stop - KP

4	Hinge	BY DOOR SUPPLIER	US4		
1	Entry Lock	H008 8807FL K620	606	YA	087100
1	Surface Closer	3321 696	YA	087100	
1	Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
3	Silencer - Metal Frame	608 RO	087100		

Set: 72.0
Doors: 1500A
Description: Sgl - Office

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1	Entry Lock	H008 8807FL K620	606	YA	087100
1	W/F Stop	RM867 / RM857	BSP	RO	087100
1	Silencer - Metal Frame	608 RO	087100		

Set: 73.0
Doors: 1668A, 2110A, 2320A, 2406A, 2416A
Description: Sgl - Office - Sound Seals

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1	Entry Lock	H008 8807FL K620	606	YA	087100
1	W/F Stop	RM867 / RM857	BSP	RO	087100
1	Gasketing Sgl	S773BL PE	087100		
1	Gasketing	303AS PE	087100		
1	Door Bottom	STC4131CPK		PE	087100

Set: 74.0
Doors: 2222A, 2224A
Description: Sgl - Rim/Lever - Closer/stop - KP - Sound Seals. Frameless Doors in Millwork Panel (classrooms)

4	Concealed Hinge	BY FRAME MFR	US4		081214
1	Rim Exit, Classroom	7100 H008 626F K600	606	YA	087100
1	Surface Closer	3321	696	YA	087100
1	Gasketing Sgl	S773BL PE	087100		
1	Gasketing	303AS PE	087100		
1	Door Bottom	STC4131CPK		PE	087100

Set: 75.0
Doors: 3318A
Description: Sgl - Passage - Closer - KP

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100

1 Passage Latch	H008 8801FL	606	YA	087100
1 Surface Closer	2800ST 696	NO	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
3 Silencer - Metal Frame	608 RO	087100		

Set: 76.0
Doors: 3318B
Description: Sgl - Passage - Closer - KP

4 Hinge, Full Mortise, Hvy Wt	TA786 FT 5" x 4-1/2"	US4	MK	087100
1 Passage Latch	H008 8801FL	606	YA	087100
1 Surface Closer	2800ST 696	NO	087100	
1 Kick Plate	K1050 10" 4BE CSK	US4	RO	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
3 Silencer - Metal Frame	608 RO	087100		

Set: 77.0
Doors: 1306A, 1308A, 1312A, 2210A, 2212A, 2214A, 2216A, 2218A, 2220A, 2302A, 2304A, 2308A, 2310A, 2312A, 2314A
Description: Sgl - Passage - Sound Seals. Frameless doors in Millwork Panels (Small Group/ Study)

4 Concealed Hinge	BY FRAME MFR	US4		081214
1 Passage Latch	H008 8801FL	606	YA	087100
1 Surface Closer	3321	696	YA	087100
1 Gasketing Sgl	S773BL PE	087100		
1 Gasketing	303AS PE	087100		
1 Door Bottom	STC4131CPK		PE	087100

Notes: Provide two rows of seals for sound control.

Set: 78.0
Doors: 1504A, 1646A, 3126A, 3126B, 3138A, 3148A, 3150A, 3508A, 4130A
Description: Sgl - Passage - Sound Seals

4 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Passage Latch	H008 8801FL	606	YA	087100
1 W/F Stop	RM867 / RM857	BSP	RO	087100
1 Gasketing Sgl	S773BL PE	087100		
1 Gasketing	303AS PE	087100		
1 Door Bottom	STC4131CPK		PE	087100

Notes: Provide two rows of seals for sound control.

Set: 79.0
Doors: 4118A
Description: Sgl - Passage - OH Stop

4 Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK	087100
1 Passage Latch	H008 8801FL	606	YA	087100

1	Surf Overhead Stop	9-336 606	RF	087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 80.0
Doors: 1302A, 1304A, 1666A, 3128A, 3514A
Description: Sgl - Privacy/IND

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Privacy Lock	H008 8802FL V20	606	YA 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
1	Gasketing Sgl	S773BL PE	087100	

Set: 81.0
Doors: 1318A, 1416A, 1524A, 1525A, 1608A, 1620A, 1663A, 1664A, 1673B, 1676A, 1698A, 2104A, 3220A, 4002FFF, 4002GGG, 4120A
Description: Sgl - Privacy/IND - OH Stop

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Privacy Lock	H008 8802FL V20	606	YA 087100
1	Surf Overhead Stop	10-336 606	RF	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
1	Gasketing Sgl	S773BL PE	087100	

Notes:
Provide stop as required

Set: 82.0
Doors: 1110A, 2309A, 3006A
Description: Sgl - Privacy/IND - OH Stop

4	Hinge	BY DOOR SUPPLIER	US4	
1	Privacy Lock	H008 8802FL V20	606	YA 087100
1	Surf Overhead Stop	10-336 606	RF	087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
1	Gasketing Sgl	S773BL PE	087100	

Notes:
Provide stop as required

Set: 83.0
Doors: 1412A, 1414A, 3510A, 3512A
Description: Sgl - Push/Pull - Closer - KP

4	Hinge, Full Mortise	TA714 FT 4-1/2" x 4-1/2"	US4	MK 087100
1	Push Plate	70F US4	RO	087100
1	Straight Door Pull	RM3301-60 Mtg-Type 12XHD	US4	RO 087100
1	Surface Closer	3301 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 84.0
Doors: 1116A, 1118A, 2202A, 2204A, 2508A, 2510A, 3002A, 3004A, 4002A, 4004A
Description: Sgl - Push/Pull - Closer - KP

4	Hinge	BY DOOR SUPPLIER	US4	
1	Push Plate	70F US4	RO	087100
1	Straight Door Pull	RM3301-60 Mtg-Type 12XHD	US4	RO 087100
1	Surface Closer	3301 696	YA	087100
1	Kick Plate	K1050 10" 4BE CSK	US4	RO 087100
1	W/F Stop	RM867 / RM857	BSP	RO 087100
3	Silencer - Metal Frame	608 RO	087100	

Set: 85.0
Doors: 1222A, 1224A, 1230A, 1234A, 1236A, 1238A, 1402A, 1404A, 1510A, 1512A, 1514A, 1516A, 1518A, 1612A, 1614A, 1618A, 1650A, 1652A, 1654A, 1656A, 1658A, 1662A, 1669A, 1670A, 1674A, 1675A, 2318A, 2319A, 3106A, 3108A, 3110A, 3112A, 3114A, 3116A, 3118A, 3120A, 3122A, 3130A, 3132A, 3134A, 3136A, 3140A, 3142A, 3144A, 3146A, 3152A, 3154A, 3156A, 3158A, 3160A, 3162A, 3164A, 3202A, 3204A, 3206A, 3208A, 3210A, 3212A, 3214A, 3216A, 3222A, 3224A, 3226A, 3228A, 3232A, 3234A, 3236A, 3238A, 3240A, 3242A, 3244A, 3246A, 3402A, 3404A, 3406A, 4106A, 4108A, 4110A, 4112A, 4114A, 4122A, 4124A, 4126A, 4128A, 4132A, 4134A, 4136A, 4138A, 4140A, 4142A, 4144A
Description: Cyl Only

1	Mortise Cylinder	K620	606	YA	087100
1	Balance of hardware by the door provider		00		

Notes:
Provide cylinders as required for locking.

Set: 86.0
Description: All Hardware by Dr provider

1	All Hardware by door manufacturer.	00

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install glass specified.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

1.04 QUALITY ASSURANCE

A. Qualifications of Installers: Provide at least one person thoroughly trained and experienced in skills required, completely familiar with referenced standards and requirements of this work and to personally direct installation performed under this Section.

B. Applicable Standards For Glass and Glazing Work: Conform to the "Manual of Glazing" of the Flat Glass Marketing Association, requirements of Federal Specification DD-G-451c and Safety Standard 16 CFR 1201 of the U.S. Consumer Products Safety Commission.

1.05 PRODUCT HANDLING

A. Protection: Protect glass and glazing materials before, during, and after installation. Protect installed work and materials of other trades.

B. Replacements: In event of damage, immediately make repairs and replacements necessary and at Contractor's expense.

PART 2 - PRODUCTS

2.01 GENERAL QUALITY REQUIREMENTS

A. No manufacturer logos are allowed on any glass. Provide certification to General Contractor that tempered, heat strengthened, annealed, laminated, etc. glass was used

where required.

B. Annealed float glass shall comply with ASTM C1036, Type I, Class 1 (clear), Class 2 (tinted), Quality-Q3.

C. Heat-strengthened float glass shall comply with ASTM C1048, TypeI, Class 1 (clear), Class 2 (tinted), Quality Q3, Kind HS.

D. Tempered float glass shall comply with ASTM C1048, Type I, Class 1 (clear), Class 2 (tinted), Quality Q3, Kind FT.

E. Laminated glass to comply with ASTM C1172.

F. IG units consist of glass lites separated by a dehydrated airspace that is hermetically dual sealed with a primary seal of polyisobutylene (PIB) or Thermoplastic Spacer (TPS) a and a secondary seal of silicone or an organic sealant depending on the application.

G. Insulating glass units are certified through the Insulating Glass Certification Council (IGCC) to ASTM E2190.

H. Special Glass Required by Building Code:
1. Provide safety glazing as required by code.
2. Provide heat strengthened glass where required by design pressures, anticipated thermal stress, or use in spandrel areas.
3. Provide fully tempered glass only where safety glazing is mandatory or where pressures exceed capacity of heat strengthened glass.
4. Provide Fire Resistive and/or Fire Protective rated glass where required.

2.02 GLASS AND COATING SCHEDULES

A. Monolithic Glass Schedule:
GL 1 - ½" Tempered (interior glazing w/o vertical mulls up to 10' and linked with silicone)

GL 1M - ½" Laminated, Mirrored (Simulation Control Room Windows)

GL 2 – 3/4" Tempered Glass, Clear (Cantilevered Glass Guardrail at openings and stairs, interior glazing w/o vertical mulls over 10' and linked with silicone)

B. Laminated Glass: S.A. Bendheim, Ltd., 800-606-7621, www.bendheim.com; or approved substitute.
1. Comply with ASTM C1172, ANSI Z97.1, and CPSC 16 CFR 1201, Category II.
2. Laminate glass by manufacturer's standard heat and pressure process.
3. Description: To match Architect's sample.
4. Annealed or Tempered as required by Code.
5. Interlayer: Bridgestone EVA, Uvekol, or PVB.
6. Overall thickness: As noted
7. Edge treatment: Flat Polished

GL 3F – ¾" Laminated Glass with Integral Pattern Film (Frosted White, Multiple Locations)

GL 3M – ¾" Laminated Glass with Integral Pattern Film (Custom Pattern A) (Monumental Stair)

GL 3L – ¾" Laminated Glass with Integral Pattern Film (Custom Pattern B) (Library Glass)

GL 3G – ¾" Laminated Glass with Integral 'Gold Mirror' Film (Library Bump Out)

C. Glass Film Schedule:
VF: Vinyl Film, Manufacturer: 3M, standard film in custom CNC cut pattern

2.03 INSULATING GLASS UNITS

A. Manufacturer is used in this section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced standards.
1. Oldcastle Glass
2. Guardian Industries
3. Pilkington
4. Vitro Industries
5. Visteon Float Glass
6. Approved equal

B. Insulating glass units are certified through the Insulating Glass Certification Council (IGCC) to either ASTM E774, or to ASTM E2190, or both.

C. Insulating glass shall have double edge seals. Primary seal shall be extruded polyisobutylene continuously bonded to glass surfaces and desiccant filled metal spacer, including corners. Minimum width of primary seal shall be 0.125 inch. Secondary seal shall be Momentive IGS 3723 or Dow Corning 982. Secondary seal shall completely cover spacer with no gaps or voids, and shall be continuously bonded to both plates of glass. Where insulating glass is supported by structural silicone, secondary seal shall be designed to transfer specified pressures from outdoor glass to indoor glass.
1. At structural silicone glazed assemblies, the metal spacer between panes of glass is to be Black.

D. High Performance Coating Schedule:
1. "Low-E" Coating: Vitro Solarban 90 (2) Clear + Clear VLT: 51, SHGC: .23
2. Reflective Coating: Vitro Solarban R100 (2) + Clear VLT: 43, SHGC: .23

E. Insulated Glass Unit Schedule:
IGU-1: 1" IGU, ¼" Clear Temp - ¼" Clear Temp, ½" Air Space. Low-E Coating (#2) Typical exterior curtainwall

IGU-2: 1" IGU, ¼" Clear Temp - ¼" Spandrel (#3), ½" Air Space. Low-E Coating (#2) Typical exterior curtainwall

IGU-3: 1+” IGU, ¼”+/- Clear Laminated - ¼” Clear, ½” Air Space. Low-E Coating (#2)
North wall, acoustic separation from mech yard

IGU-4: 1” IGU, ¼” minimum Clear Temp - ¼” minimum Clear Temp, ½” Air Space. Reflective Coating (#2)
At engineered angled walls

IGU-5: 1” IGU, ¼” minimum Clear Temp - ¼” minimum Spandrel (#3), ½” Air Space. Reflective Coating (#2)
At engineered angled walls

2.04 GLAZING ACCESSORIES

A. Provide glazing accessories required to complete glazing work that are compatible with various components of the glazing system(s), and subject to approval of Architect.

B. Glazing Sealants: As specified in Section 07 9000

C. Glazing gaskets, sealant backers within glazing pockets, and continuous glass spacer pads at structural silicone shall be black extruded dense silicone.

D. Glazing Tape: Bostik "Chem Tape 60", Pecora "Shim-Seal", or Tremco "Pre-shimmed Tremco 440 Tape".

E. Setting Blocks: Silicone blocks tested for compatibility with specified glazing sealants. Provide side blocks at both jambs, between midheight and top corner of glass, at four-side conventional dry glazed openings. Side blocks are not required where glass is continuously sealed with silicone sealant at two or more edges.

F. Spacers: Saint-Gobain Performance Plastics V2100 Thermalbond Tape is acceptable as a glass spacer when used in conjunction with structural silicone, subject to verification of compatibility.

G. Compressible Filler Rod: Closed-cell or waterproof-jacketed foam of polyethylene, butyl rubber, neoprene, polyurethane or vinyl, tested for compatibility with specified glazing sealants, of 5 to 10 psi compression strength (25% deflection), recommended by sealant manufacturer for use in glazing channel to prevent sealant exudation from the channel.

H. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors by spot application method (25% coverage) without support, to be used in 1/8" to 1/2" thickness.

2.05 GLASS RAILING SYSTEM

A. Ornamental Glass Stair Railings: Installed glass rail systems/assemblies shall be tested to remain in place as a barrier following impact or glass breakage in accordance with ASTM E2353
   1. Railing Type 1
      a. Locations: L3/L4 Office Guardrails, L2 Gallery Access Stair
      b. Provide glass stair railing system with 3/4" tempered glass CRL/Julius Blum & Co., 201-438-4600.
      c. Components
         1) Recessed, Square Base Shoe, type per details/condition
         2) Exposed top glass edge (without top cap), polished
         3) Satin Brass Guardrail at stairs, where indicated
   2. Railing Type 2
      a. Location : Monumental Stair
      b. Provide custom glass stair railing system with 3/4” laminated glass with components by CRL/Julius Blum
      c. Components:
         1) Recessed, Square Base Shoe
         2) Exposed top glass edge (without top cap), polished
         3) Satin Brass Guardrail
         4) Satin Brass Guardrail attachments per drawings

PART 3 - EXECUTION

3.01 GLASS SIZES

A. Measure sizes for glass from actual frames, doors and windows. Contract requires glass to be set in place, and Contractor assumes responsibility for correct sizes. Use sizes shown on Drawings for estimating only as approximate dimensions.

3.02 GLAZING SURFACES

A. Glaze only dry surfaces, free from dust or ice. Clean dirty surfaces with cloth saturated with turpentine or mineral spirits before glazing. Remove loose dirt particles and mortar from recesses prior to installation of glass and glazing materials.

3.03 SETTING GLASS

A. Set glass to provide equal bearing for entire width of each pane. Contractor responsible for broken glass due to improper setting. Set using glazing stops furnished by door or fixed framing manufacturer unless otherwise shown or specified. Accurately set glass to fit frame, with all edges smooth. Sharp ragged edges are not acceptable. Cushion glass in fixed interior view windows with felt strips around entire perimeter.

3.04 CLEANING GLASS

A. Contractor shall employ services of a professional window washer at completion of all work to wash glass which has been installed under this contract, removing all stains.

B. Clean glass on both sides after painting operations are complete and dry. Do not use acid solutions or caustic soaps to clean glass.

C. Do not use razor blades to clean glass. Any scratches on the glass caused by the cleaning process will be cause for the removal and replacement of the damaged glass at the Contractor's expense.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Fire rated framing system and fire rated glass.

1.02 RELATED DOCUMENTS

A. Applicable portions of the Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of the Contract, other documents listed in the Agreement and Modifications issued after the execution of the Contract shall apply to this Section. The general requirements for this work are located in Division 1 of the Specifications.

1.03 SUBMITTALS AND SUBSTITUTIONS

A. In accordance with Section 01 3000.

B. Substitutions will not be considered prior to the award of the General Contract.

C. Shop Drawings: Submit shop drawings showing layout, profiles and product components.

D. Samples: Submit samples for finishes, colors and textures.

E. Technical Information: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.

1.04 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM E119 Methods for Fire Tests of Building Construction and Materials.
   2. ASTM E152 Methods of Fire Tests of Door Assemblies.
   3. ASTM E163 Methods for Fire Tests of Window Assemblies.
   4. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-hinged and Pivoted Swinging Door Assemblies.
   5. ASTM E2110-1: Standard Test for Positive Pressure of Fire Tests of Window Assemblies.

B. National Fire Protection Association (NFPA):
   1. NFPA 80: Fire Doors and Windows.
   2. NFPA 251: Fire Tests of Building Construction and Materials.
   3. NFPA 252: Fire Tests of Door Assemblies.
   4. NFPA 257: Fire Tests of Window Assemblies.

C. Underwriters Laboratories, Inc. (UL):
1. UL 9: Standard for Safety of Fire Tests of Window Assemblies.
2. UL 10B: Standard for Safety of Fire Tests of Door Assemblies.
3. UL 10C: Standard for Safety of Positive Pressure Fire Tests of Door Assemblies.
4. UL 263: Fire Tests of Building Construction and Materials.
5. UL 752-2005: Standard for Safety for Bullet-Resisting Equipment.

D. Standard Council of Canada (ULC):
1. ULC Standard CAN4-S101: Fire Tests of Building Construction and Materials.
2. ULC Standard CAN4-S104: Fire Tests of Door Assemblies.
3. ULC Standard CAN4-S106: Fire Tests of Window Assemblies.

E. Consumer Product Safety Commission (CPSC):
1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials.

1.05 SYSTEM DESCRIPTION

A. Performance Requirements:
1. Fire Rating: 20, 45, 60, 90 or 120 minutes as specified.
2. Fire Resistive Wall Assembly Certifications: 60-120 minute fire resistive wall assemblies tested in accordance with ASTM E119, NFPA 251, UL 263 and ULC-S101.
3. Fire Resistive Door Assembly Certifications: 60-90 minute fire resistive door assemblies tested in accordance with ASTM E119, NFPA 251, UL 263 and ULC-S101.
4. Fire Protective Door Assembly Certifications: 20-45 minute fire protective door assemblies shall be tested in accordance with NFPA 80, NFPA 252, ASTM E152, ASTM E2074, UL 10B, UL 10C and CAN4-S104.
5. Fire Protective Window Assembly Certifications: 20-45 minute fire protective window assemblies shall be tested in accordance with NFPA 80, NFPA 257, ASTM E163, ASTM E2010, UL 9 and CAN4-S106.

B. Listings and Labels:
1. Fire rated framing system shall be under current follow-up service by a nationally recognized independent laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

C. Appearance:
1. Fire rated wall/door assembly shall have a neat finished appearance with minimum joints at decorative cover intersections.

1.06 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division1 Product Requirements Sections.

B. Ordering: Comply with manufacturer’s ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials to specified destinations in manufacturer's or distributor's packaging undamaged, complete with installation instructions.

D. Storage and Protection: Store off ground, under cover, protected from weather and construction activities and at temperature conditions recommended by manufacturer.

1.07 FABRICATION DIMENSIONS

A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.08 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is not intended to limit other rights that the Owner may have under the Contract Documents.
   1. Warranty Period: 5 years from date of shipping.

PART 2 - PRODUCTS

2.01 MANUFACTURERS – FIRE RATED (DOOR) (OPENING) (WALL ASSEMBLY)

A. Manufacturer of Framing System: SAFTI*fire*™ GPX Framing as manufactured and distributed by SAFTI *FIRST*™ Fire Rated Glazing Solutions.

B. Manufacturer of Glazing Material: SuperLite™ II-XL 90 as manufactured and distributed by SAFTI *FIRST*™ Fire Rated Glazing Solutions.
   1. Optically Clear Glass
   2. 120 min rating (location at 2-hr rated stair enclosures, typ).

C. Manufacturer of Glazing Material: SuperLite™ II-XLB 60 as manufactured and distributed by SAFTI *FIRST*™ Fire Rated Glazing Solutions.
   1. Optically Clear Glass
   2. Butt-Glazed Application
   3. 60 min rating (location at 1-hr rated Student Area at Level 3).

D. Alternate system manufacturer's may be considered if they can demonstrate a complete UL tested framing and glazing system.

2.02 MATERIALS – FRAMING

A. Fire resistive, temperature rise framing system rated for 20 to 120 minutes.

B. Properties:
   1. Frame thickness: 3" Standard.

2. Internal framing: Internal tube steel framing shall conform to ASTM A501. Formed steel retainers shall be galvanized conforming to ASTM A527.
3. Insulation: The framing system shall insulate against the effects of fire, smoke and heat transfer from either side. The perimeter of the framing system to the rough opening shall be firmly packed with mineral wool fire stop insulation or appropriately rated intumescent sealant.
4. Fasteners: Type recommended by manufacturer.
5. Glazing accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant glazing tape. The SuperLite™ glazing panel shall be caulked continuously around the edge to the tube steel frame utilizing neutral cure silicone.

2.04 FABRICATION

A. Assemblies shall be furnished knocked down for field assembly and will be glazed in the field.

B. Door assemblies shall be factory prepared for field mounting of hardware.

C. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance. Obtain approved shop drawings prior to fabrication.

2.05 FINISHES

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

B. Covers shall be chemically cleaned and pretreated; then, finished with:
1. High Performance Fluoropolymer Finish by PPG. Solid color to be selected from SAFTI's Standard Color Chart. Mica, XL & Exotics are available at an additional charge.
2. Custom color finish to match exterior curtainwall mullions : PREMIUM METALIC PAINT

C. Protect finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.

D. Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data including product technical bulletins and installation instructions.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions. Openings shall be plumb, square and within allowable tolerances. The Architect/Engineer shall be notified of any conditions that jeopardize the integrity of the proposed fire wall/door framing system. Do not proceed until such conditions are corrected.

3.03 INSTALLATION

A. Fire wall/door installation shall be by a licensed contractor and in strict accordance with the approved shop drawings.

3.04 CLEANING AND PROTECTION

A. Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.

B. Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.

C. Remove temporary coverings and protection of adjacent work areas.

D. Remove construction debris from project site and legally dispose of debris.

END OF SECTION