

DIVISION 8

DOORS AND WINDOWS

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SECTION 08110

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior standard hollow metal doors and frames.
 - 2. Exterior hollow metal doors and frames to comply with 130 mph wind speed and large missile impact for an Occupancy Category IV. Refer to structural drawings for design pressure requirements.
- B. Related Section:
 - 1. Section 07210 - Building Insulation: Foamed-in-place insulation for filling voids in steel door frames when installed in metal stud walls. Refer to Section 04200 - Unit Masonry for grouting frames solid at masonry walls.
 - 2. Section 07920 - Joint Sealants: Caulking of joints between steel frames and other building components.
 - 3. Section 08710 - Finish Hardware: Door hardware for steel doors.
 - 4. Section 08800 - Glazing: Glass for steel door lights.
 - 5. Section 09960 - High Performance Coating: Paint finish for exterior and interior steel doors and frames.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and catalog sheets for each type of product specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details. Show anchorage and accessory items.
- C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.
- D. Label Construction Certification: For assemblies required to be fire-rated and exceeding label limitations, submit manufacturer's certification that each assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.3 QUALITY ASSURANCE

- A. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
- B. Single Source Manufacturer: Provide doors and frames from a single manufacturer who is a member of the Steel Door Institute.
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
 - 1. Temperature Rise Rating: Where indicated provide doors that have a temperature rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Amweld Building Products, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Curries Company; an Assa Abloy Group company.
 - 4. Steelcraft; an Ingersoll-Rand company.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: Commercial quality, stretcher leveled flatness, cold-rolled steel, free from scale, pitting or other surface defects, complying with ASTM A 366 and A 568 general requirements.
- B. Galvanized Steel Sheets: Shall be manufactured from hot-dipped galvanized steel, G60 zinc coating conforming to ASTM A 924. Galvanized doors shall have galvanized hardware reinforcement. To be used at all exterior doors, unless noted otherwise.
- C. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- F. Core: Provide manufacturer's standard core for thermally improved doors with maximum U-value of 0.24 btu/hr/sq.ft./degree F (ASTM C236) for all exterior doors.
- G. Glazing: Division 08 Section "Glazing."
- H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other

2.3 STANDARD HOLLOW METAL DOORS

- A. Steel Doors, General: Complying with ANSI/SDI A250.8 for level and model and ANSI A250.4 for physical endurance level indicated. Provide 1-3/4-inch thick doors or as indicated on drawings. Fabricate with smooth surfaces, without visible joints or seams on exposed faces.
 - 1. [INTERIOR DOORS:](Heavy-Duty Doors) Level 2 and Physical Performance Level B, Model 2 Seamless design, minimum 0.0478-inch-thick cold-rolled steel sheet faces (18 gage). The door top is closed flush.
 - 2. EXTERIOR DOORS:(Maximum-Duty Doors) Level 4 and Physical Performance Level A, Model 1 (Full Flush) design, minimum 0.067-inch-thick from (galvanized) metallic-coated steel sheets (14 gage). The door top is closed flush.

- B. Labeled Doors: Insulate as required by Underwriters Laboratories. Build in special hardware and provide astragals as indicated. At one hour and at 1-1/2 hour doors at enclosures, maximum transmitted temperature end point shall not exceed 450 degrees F. above ambient at end of 30 minutes of fire exposure.
- C. Seamless Vertical Edges: Both lock and hinge rail edge of the door shall be welded, filled and ground smooth the full height of the door.
- D. Special Reinforcing: At exterior doors, reinforce inside of door on hinge side with high frequency hinge preparation. Weld to door.
- E. Internal Construction: Reinforce tops and bottoms of internal core with 16-gage, horizontal steel channels, welded continuously to core faces.
 - 1. Core of labeled doors shall be manufacturer's standard construction for required fire resistance rating.
 - 2. Exterior Doors: Polyurethane or polystyrene core complying with ANSI/SDI -A250.8. Close top and bottom edges flush to provide weather seal.
- F. Hardware: Mortise, reinforce, drill and tap for hardware furnished under Section 08710 - Door Hardware, except drilling and tapping for surface door closers, door closer brackets and adjusters shall be done in field. Obtain templates from hardware suppliers.
- G. Finish: Provide prime coat finish on doors. Thoroughly clean off rust, grease and other impurities. Grind welds smooth, no marks shall show. Apply metallic filler as required to fill cracks and joints and to level any weld areas to similar imperfections. Sand filler coat smooth.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: ANSI A250.8; conceal fastenings and with details indicated for type and profile.
- B. Frame Steel Sheet Thickness:
 - 1. Cold-rolled steel, minimum 0.042-inch-thick (18 gage) for wood doors.
 - 2. Galvanized steel, minimum 0.067-inch-thick (14 gage) for level 4 steel doors. Include anchors, reinforcement, stiffeners, stops and moldings.
- C. Fabricate frames with mitered or coped corners and welded construction.
 - 1. Welded frame joints shall be continuously welded at face, soffit, stop and back bend, and ground smooth at face and back bend.
 - 2. Drywall Returns: Frames installed in drywall partitions shall be furnished with drywall returns.
- D. Door Silencers: Except on weather stripped frames, drill stops to receive 3 silencers on strike jambs of single door frames and 2 silencers on heads of double door frames.
- E. Ceiling Struts: Minimum 1/4-thick by 1-inch wide steel.
- F. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Zinc-coat items that are to be built into exterior walls according to ASTM A 153/A 153M, Class C or D as applicable.
- G. Workmanship: Fabricate so no grind marks, hollow or other out-of-plane areas are visible. At joints of intermediate members, provide tight joining, neatly accomplished without holes, burned out spots, weld build up or other defacing work. Fill to close cracks and to preserve shapes. Tightly fit loose stops, to hairline joints.
- H. Labeled Frames: Construct in accordance with requirements for labeled work. Attach proper U.L. label, Warnock Hersey, "B" labeled frames shall be 1-1/2 hour construction.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.

2.6 GLASS AND LOUVER OPENINGS

- A. Louvers: Provide lightproof louvers for interior doors, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.
- B. Sidelites: Form integral fixed stops and provide pre-fit, pre-attached removable stops. Fix stops shall be located on the outside of the opening. Minimum stop depth shall be 5/8-inch. Removable stops shall be 18 gage and may be mitered or butted at corners and shall be secured with countersunk screws not more than 8 inches on center. Coordinate work specified in Section 08800 "Glazing."

2.7 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick. At masonry walls follow grouting standards, refer to Section 04200 - Unit Masonry.

2.8 FABRICATION

- A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- B. Hollow Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration. Provide close top, bottom and side edges of doors flush as an integral part of the door construction.
 - 2. Glazed Lites: Factory cut openings in doors.
 - 3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - 2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
 - a. Single-Door Frames: Three door silencers.
 - b. Double-Door Frames: Two door silencers.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Section 08710 "Door Hardware."
 1. Hinge reinforcement shall be 7 gage.
 2. Surface applied closer reinforcement and hold open arm reinforcement shall be 12 gage.
 3. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.
 4. Locate hardware as indicated on final shop drawings or if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute (DHI).
 5. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 electrical Sections.

2.9 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 1. Primer: Provide primer as indicated and specified in Section 09960 "High Performance Coatings."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable glazing stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.

- f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
 2. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 3. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
 4. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 - B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.
 - C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: Maximum 1/16 inch (1.6 mm), 2 credit card thickness.
 - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) maximum.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 1/2 inch.
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors according to NFPA 105.
 - D. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
 - E. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.
- 3.2 ADJUSTING AND CLEANING
 - A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
 - B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION

SECTION 08211

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid-core Doors with wood-veneer faces and factory finishing.
 - 2. Factory machining for hardware.
- B. Related Sections:
 - 1. Division 08 Section "Glazing" for glass view panels in flush wood doors. Glazing shall be factory installed with wood beads.

1.2 SUBMITTALS

- A. Product Data: For each type of door indicated. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; mortises, holes, and cutouts; requirements for veneer matching; factory finishing; fire ratings; and other pertinent data.
- C. Samples: For factory-finished doors for Architect's approval.

1.3 QUALITY ASSURANCE

- A. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
- B. Fire-Rated Wood Doors: Doors 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 NFPA 252 and UL10C, Category A.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect door during transit, storage and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's written instructions.
 - 1. Individually package doors in cardboard cartons and wrap bundles of doors in plastic sheeting.
- B. Mark each door with individual opening numbers used on Shop Drawings. Use removable tags of concealed markings.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet-work is complete and HVAC system is operating and will maintain temperature and relative humidity at occupancy level during the remainder of the construction period.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup or twist) more than 1/4-inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion.
 - a. Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flush Wood Doors:
 - a. IPIK Door Co. (Basis-of-design)
 - b. Algoma Hardwoods Inc.
 - c. Eggers Industries; Architectural Door Division.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not add urea formaldehyde.
- B. Doors for Transparent Stained with clear sealerFinish:
 - 1. Grade: Premium, except Grade A faces are acceptable.
 - 2. Species and Cut: American Black Cherry.
 - 3. Match between Veneer Leaves: Slip match.
 - 4. Assembly of Veneer Leaves on Door Faces: Running match.
 - 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
- C. Interior Veneer-Faced Solid-Core Doors:
 - 1. Core: Structural composite lumber.
 - a. Screw Withdrawal, Face: 700 lbf. (3100 N)
 - b. Screw Withdrawal, Edge: 475 lbf. (1780 N)
 - 2. Construction: Five or seven plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.
 - a. WDMA I.S. 1-A Performance Grade: Heavy Duty.
 - 3. Door Stiles minimum width 1-1/4-inch with at least 3/8-inch outer band of matching hardwood to match face veneers inner stile can be mill option hardwood or structural composite lumber.
 - 4. Top and bottom rails must be 1-3/4-inch wide mill option hardwood or structural composite lumber.
 - 5. Provide solid wood stile - veneers are not allowed.
- D. Fire-Rated Doors:
 - 1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.

2. Edge Construction: Intumescent seals concealed (Comply with local code, jurisdiction and UL10C, Category A testing) by outer stile matching face veneer, and laminated backing for improved screw-holding capability and split resistance.
 3. Pairs: Furnish formed-steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated.
- E. Blocking: For mineral-core doors, provide blocking as needed to eliminate through-bolting hardware. For mineral-core doors use composite blocking with improved screw-holding capability. Though bolting is not acceptable.

2.3 FABRICATION

- A. Job fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 2. Metal Astragals: Pre-machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- C. Openings: Cut and trim openings through doors in factory.
1. Light Openings: Provide Wood Beads for light openings in wood doors.
 - a. Wood: Same species as door faces.
 - b. Profile: Manufacturer's standard shape.
 - c. Finish: Factory finish to match door.
 - d. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch (1.2mm thick), cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing."
- D. All doors shall be Carton, tagged, and labeled so that location is visible without removing cardboard wrapping.

2.4 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises, but must be sealed.
- B. Finish doors at factory that are indicated to receive transparent finish. Field finish doors indicated to receive opaque finish.
1. Samples: Provide Samples for verification and finish systems used.
 2. Grade: Custom.
 3. Finish: Manufacturer's standard water-base finish with UV cured inhibitors.
 4. Staining: Stain to match architects finish prior to clear finish sealer.
 5. Sheen: Satin.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION

SECTION 08311

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes access doors and frames for walls and ceilings.
- B. Coordinate size, location and quantities with mechanical, electrical, plumbing and owner's equipment suppliers.

1.2 SUBMITTALS

- A. Product Data: For each type of access door and frame indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each door face material in specified finish.
- D. Schedule: Types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

1.3 QUALITY ASSURANCE

- A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. NFPA 252 or UL 10B for vertical access doors and frames.
 - 2. ASTM E 119 or UL 263 for horizontal access doors and frames.

PART 2 - PRODUCTS

2.1 STEEL MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- B. Steel Sheet: Uncoated or electrolytic zinc-coated, ASTM A 591/A 591M with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Factory-Primed Finish: Manufacturer's standard shop primer.
- D. Drywall Beads: 0.0299-inch (0.76-mm) zinc-coated steel sheet to receive joint compound.

2.2 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. J. L. Industries, Inc.

2. Larsen's Manufacturing Company.
3. Milcor Inc.
4. Nystrom, Inc.
- B. Flush Access Doors and Trimless Frames: Fabricated from steel sheet.
 1. Locations: Wall and ceiling surfaces.
 2. Door: Minimum 0.060-inch- (1.5-mm-) thick sheet metal.
 3. Frame: Minimum 0.060-inch- (1.5-mm-) thick sheet metal with drywall bead flange.
 4. Hinges: Spring-loaded, concealed-pin type.
 5. Latch: Cam latch with interior release.
- C. Fire-Rated, Insulated, Flush Access Doors and Trimless Frames: Fabricated from steel sheet.
 1. Locations: Wall and ceiling surfaces.
 2. Fire-Resistance Rating: Not less than that indicated on the drawings.
 3. Temperature Rise Rating: 250 deg F (139 deg C) at the end of 30 minutes.
 4. Door: Flush panel with a core of mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.036 inch (0.9 mm).
 5. Frame: Minimum 0.060-inch- (1.5-mm-) thick sheet metal with drywall bead.
 6. Hinges: Concealed-pin type.
 7. Automatic Closer: Spring type.
 8. Latch: Self-latching device operated by knurled knob with interior release.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view, provide materials with smooth, flat surfaces without blemishes.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
- E. on aluminum that will come in contact with concrete.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.2 ADJUSTING AND CLEANING

- A. Adjust doors and hardware after installation for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08332

VENTILATED COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following types of manual operated overhead coiling doors:
 - 1. Ventilated Service Doors.
- B. See Division 05 Section "Metal Fabrications" for miscellaneous steel supports.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide overhead coiling doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components:
 - 1. Wind speed: To comply with 130 mph wind speed and the International Building Code (current edition) requirements.
 - 2. Provide units to be weathertight to the structure.
- B. Impact Resistance: System to meet requirements for coastal hurricane missile impact loads.
 - 1. All overhead coiling insulated doors shall be designed for Large Missile Impact (LMI) in accordance with SSTD12.
- C. Operation-Cycle Requirements: Provide overhead coiling door components and operators capable of operating for not less than 10,000 cycles and for 10 cycles per day.

1.3 SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory provide manufacturer's data sheet, preparation instructions and recommendations, storage and handling requirements and recommendations, details of construction and fabrication and installation instructions.
- B. Shop Drawings: Include detailed plans, elevations, sections, details of framing members, anchoring methods, required clearances, hardware and accessories. Include relationship with adjacent construction.
- C. Samples: For each exposed finish, provide two (2) samples minimum size 6-inches square, representing actual product, color and patterns and as specified.
 - 1. Curtain Slats: 12 inches (305 mm) long.
 - 2. Bottom Bar: 6 inches (150 mm) long with sensor edge.
 - 3. Guides: 6 inches (150 mm) long.
 - 4. Brackets: 6 inches (150 mm) square.
 - 5. Hood: 6 inches (150 mm) square.
- D. Manufacturer's Testing Reports: Provide products for each product each product specified to meet or exceed the wind and impact requirements.
- E. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualification: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project. Installer shall have a minimum of three years experience.
- C. Single Source: In accordance with accepted quality assurance guidelines for motor-operated doors, both the door and electric operator shall be manufactured by a single source producer of door systems.
- D. Pre-installation Meeting: Conduct at project site.

1.5 COORDINATION

- A. Coordinate work with other operations and installation of adjacent materials and the structure to avoid damage to installed materials.
- B. Contractor is responsible for field verifying and to provide door to fit properly within rough opening.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cookson Company.
 - 2. Cornell Iron Works Inc.
 - 3. Overhead Door Corp.; 610 Series Ventilated Service Door (Basis-of-Design)

2.2 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Interlocking roll-formed slats as specified. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch (0.71 mm) and as required to meet requirements.
 - 2. Slat type: Flat profile; Type F275 - Fenestrated door.
 - a. Slat fabricated of 22 gage galvanized steel.
- B. Finish: Galvanized steel slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked on prime paint and 0.6 mils thick baked-on enamel top coat for the hood and slates. The door and guides shall receive a factory applied powder coating.
 - 1. Color: As selected by Architect from manufacturer's full range.
- C. Weather Seals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets fitted to bottom and top of exterior doors, unless otherwise indicated. At door head, use 1/8-inch- (3-mm-) thick, replaceable, continuous sheet secured to inside of hood.

1. Vinyl bottom seal, exterior guide and internal hood seals.
2. Interior guide weather seal.
- D. Bottom Bar: Two (2) prime and painted angles, each not less 1/8 inch (3 mm) thick bolted back to back to reinforce curtain in the guides.
- E. Curtain Jamb Guides: Three (3) prime and painted structural steel angles with minimum thickness of 3/16-inch. Guides weather stripped with a vinyl weather seal at each jamb, on the exterior curtain side and interior curtain side.
- F. Brackets: Hot rolled primed and painted steel to support counterbalance, curtain and hood.
- G. Counterbalance: Adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to door curtain with barrel rings. The counterbalance shall support the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
- H. Hood: Form to act as weatherseal and entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods, and provide fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sagging.
 1. Steel Door Hoods: Minimum 24 gage thick, hot-dip galvanized steel sheet that matches slat steel. Provide gage of hood to accommodate weight of overhead coiling door.
 2. Exterior-Mounted Door: Fabricate hood with sealant-joint bead profile for applying joint sealant to provide weathertight construction.
- I. Wall Mounting Condition: Between jamb mounting.
- J. Locking Device Assembly: Provide cylinder lock for electric operation with interlock switch. Keys shall be keyed in accordance with the Owner's master locking system.
- K. Provide push-up handle and chain-link manual operation.

2.3 FABRICATION

- A. Provide the overhead door unit bolted in place to structure.

2.4 FINISHES

- A. Baked-Enamel and Powder-Coat Factory Finish: Manufacturer's standard baked-on and powder coated finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
- B. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install coiling doors and operating equipment complete with necessary hardware, jamb and head molding strips, anchors, inserts, hangers, and equipment supports
- B. Lubricate bearings and sliding parts; adjust doors to operate easily, free of warp, twist, or distortion, and with weathertight fit around entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain doors.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Any door shown on the drawings and not specifically referenced in the hardware sets shall be provided with identical hardware as specified on other similar openings and shall be included in the finish hardware suppliers bid.
- B. All doors that are fire rated shall be provided with fire rated hardware to comply with the local code requirements whether specified that way or not as a part of the hardware supplier's base bid.
- C. Exterior door hardware shall meet local hurricane code requirements. See Quality Assurance 1.4 G & H.
- D. Hardware supplier shall notify the Architect in writing of any discrepancies no less than five (5) working days prior to the bid date that could result in hardware being supplied that is non-functional, that will not meet local codes, or any door that is not covered in this specification.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Commercial door hardware for the following:
 - a. Swinging doors.
 - b. Other doors to the extent indicated.
- B. Related Sections include the following:
 - 1. Division 8 Section "Steel Doors and Frames" for astragals provided as part of a fire-rated labeled assembly and for door silencers provided as part of the frame.
 - 2. Division 8 Section "Flush Wood Doors" for astragals provided as part of a fire-rated labeled assembly.
 - 3. Division 8 Section "Aluminum Entrances and Storefronts" for entrance door hardware, except cylinders.

1.3 SUBMITTALS

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, 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.
 - a. 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.
 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. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
1. Approved hardware schedule, catalog cuts and keying schedule.
 2. Provide keying bitting list in paper and electronic format by registered mail directly to facility manager owner.
 3. Hardware installation and adjustment instructions.
 4. Manufacturer's written warranty information.
 5. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.
- 1.4 QUALITY ASSURANCE
- A. Installer Qualifications: An experienced Installer who has completed both standard and electrified builders hardware and integrated access control installations 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.
 - B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant or equivalent experience available during the course of the Work to

- consult with Contractor, Architect, and Owner about door hardware and keying. Supplier recognized by manufacturers to be a direct factory-authorized distributor of the specified hardware products.
1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant (AHC) and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- D. Source Limitations: Obtain each type and variety of aluminum, steel and wood door hardware from the same single source manufacturer and supplier, unless otherwise indicated.
- E. Regulatory Requirements: Comply with provisions of the following:
1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 2. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
 3. International Building Code (2006).
- F. Fire-Rated Door Assemblies: Provide door hardware for 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 NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
1. Test Pressure: Positive pressure labeling.
- G. Wind Loads: Provide door hardware with hollow metal assemblies capable of withstanding windload design pressures which are calculated for this project by a registered architect or engineer and is part of the construction documents and the International Building Code Design Loads per section 1609.
- H. Hurricane-Resistance Test Performance: Provide door hardware with hollow metal approved assemblies that pass large missile-impact tests and cyclic-pressure tests according to testing requirements of authorities having jurisdiction.
1. Impact Resistance: Door Hardware approved assemblies must satisfy the criteria for protection from windborne debris. The assemblies must have passed the large missile impact test (which equates to Missile Level D specified in ASTM E 1996-02). The assemblies may be installed at any height on the structure as long as the design pressure rating for the assemblies is not

exceeded. These assemblies will and do not need to be protected with an impact protective system when installed in areas where windborne debris protection is required.

- I. Keying Conference: Conduct conference to comply with requirements in Division 1 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 system.
 4. Installation of permanent keys and cylinder cores.
 5. Address and requirements for delivery of keys.
- J. Pre-Installation Conference: Conduct conference at Project site attended by representatives of Door Hardware Manufacturers, Supplier, Installer, and Contractor to review proper hardware installation methods and the procedures for receiving and handling hardware. At completion of installation, provide written certification that hardware items were applied according to conference recommendations and to finish hardware specifications.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. One complete shipment of door hardware as detailed in approved Door Hardware Schedule Shop Drawings to be inventoried on site and upon receipt of material be secure in lock-up room provided with shelving for door hardware.
- 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 permanent keys 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 WARRANTY

- A. General Warranty: 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: One year from date of Substantial Completion, unless otherwise indicated.
- C. Special Warranty Periods:
 1. Seven years for mortise locksets.
 2. Five years for exit devices.
 3. Ten years for manual door closers.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section and the Door Hardware Schedule at the end of Part 3.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated for named products listed in Hardware Sets.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule 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 quality standards of utility and performance. Unless otherwise approved provide only the specified product.
 - 2. Architect and Owner reserve the right to approve all substitutions proposed for this specification. All requests for substitution to be made prior to bid in accordance with Division 1. All requests for substitution to be made four (4) days prior to bid in accordance with Division 1, by use of formal CSI format pre-bid substitution request forms with literature and testing information provided to prove compliance and equality to specifications.

2.2 HINGES AND PIVOTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Hinges:
 - a. Hager Companies (HA).
 - b. McKinney Products (MC).
 - c. Stanley Hardware (ST).
 - d. Bommer (BO).
- B. Standards: BHMA Certified products complying with the following:
 - 1. Butts and Hinges: BHMA A156.1.
 - 2. Template Hinge Dimensions: BHMA A156.7.
- C. Quantity: Provide the following, unless otherwise indicated:
 - 1. Two Hinges: For doors with heights up to 60 inches.
 - 2. Three Hinges: For doors with heights 61 to 90 inches.
 - 3. Four Hinges: For doors with heights 91 to 120 inches.
 - 4. 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).
- D. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight
36-in by 86-in by 1-3/4	4-1/2	0.134	0.180

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight
< 36-in by 120-in by 1-3/4	5	0.146	0.190

- E. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - 1. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
 - 2. Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.
- F. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
 - 1. Non-removable Pins: 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 following applications:
 - a. Out-swinging exterior doors.
 - b. Out-swinging access controlled doors.

2.3 DOOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flush Bolts and Coordinators:
 - a. McKinney Products (MC).
 - b. Hager Companies (HA).
 - c. Rockwood Manufacturing (RO).
 - d. Trimco Manufacturing (TR).
- B. Standards: Comply with the following:
 - 1. Surface Bolts: BHMA A156.16.
 - 2. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
 - 3. Manual Flush Bolts: BHMA A156.16.
- C. Surface Bolts and Flush Bolts: BHMA Certified Grade 1.
- D. Provide bolts with top rod of sufficient length to allow bolt location approximately six feet from the floor regardless if detailed as such in hardware sets. Furnish dust proof strikes for bottom bolts. Surface bolts to be 8" in length, unless otherwise noted and U.L. listed for labeled fire doors.
- E. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 - 1. Mortise Flush Bolts: Minimum 3/4-inch throw.

2.4 LOCKS AND LATCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Mechanical Mortise Locks and Latches:
 - a. Corbin Russwin Hardware (CR) - ML2000 Series.
 - b. Sargent Manufacturing (SA) - 8200 Series.
 - c. Schlage (SC) - L9000 Series
 - d. Yale Security Group (YA) - 8800 Series.
 - e. Best Access Systems (BE) - 45H Series.

- B. Standards: Comply with the following:
 - 1. Mortise Locks and Latches: BHMA A156.13.
 - 2. Auxiliary Locks: BHMA A156.5.
- C. Mortise Locks: BHMA Certified Grade 1, Series 1000.
- D. Auxiliary Locks: BHMA Certified Grade 1.
- E. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following (unless scheduled otherwise in the hardware sets):
 - 1. Mortise Locks: BHMA A156.13.
- F. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 - 1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
 - 2. Deadbolts: Minimum 1-inch bolt throw.
- G. All mortise locks to be easily field reversible without opening the lock case.
- H. All mortise locks to have stainless steel latchbolts and stainless steel deadbolts.
- I. Backset: 2-3/4 inches unless otherwise indicated.

2.5 CYLINDERS AND KEYING

- A. All locks to be keyed to master key system as outlined by the owner in the keying conference.
- B. Standards: Comply with the following:
 - 1. Cylinders: BHMA A156.5.
 - 2. Key Control System: BHMA A156.5.
- C. Cylinder Grade: BHMA Certified Grade 1.
- D. Construction Keying: Comply with the following:
 - 1. Construction Master keying: Provide temporary construction master keyed cylinders as required, by the contractor, to maintain adequate security during the construction period. Provide construction master keys in quantity as required by project Contractor.
- E. Keying System: Unless otherwise indicated, provide for a keying system complying with the following requirements:
 - 1. Master Key System: Cylinders are factory keyed operated by a change key, master key, and a grand master key. Conduct keying meeting with End User to define and document keying system instructions and requirements.
- F. Keys: Provide nickel-silver keys complying with the following:
 - 1. Stamping: Permanently inscribe each key with a visual key control number and as directed by Owner.
 - 2. Quantity: Provide the following:
 - a. Cylinder Change Keys (Per Key Set): Three.
 - b. Master Keys (Per Level): Five.
 - c. Grand Master Keys: Two.
- G. Key Registration List: Provide keying transcript list to Owner's representative for lock cylinders.
- H. Key Control System: Provide one lockable cabinet for key control and storage for up to 150 percent capacity, type and model to be determined in the keying meeting with the owner.

2.6 EXIT DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Exit Devices:
 - a. Corbin Russwin Hardware (CR) - ED5000S Series
 - b. Von Duprin (VO) - 99 Series.
 - c. Yale Security Group (YA) - 7000 Series
 - d. Sargent - 80 Series.
- B. Standard: BHMA A156.3.
- C. Exit Devices: BHMA Certified Grade 1.
- D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- E. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.
- F. Outside Trim: Match design for locksets and latchsets, unless otherwise indicated.
- G. Through Bolt Installation: For exit devices and trim as required for fire rated wood doors.

2.7 ACCESSORIES FOR PAIRS OF DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Keyed Removable Mullions:
 - a. Corbin Russwin Hardware (C-R).
 - b. Von Duprin (VO).
 - c. Yale Security Group (YA).
 - d. Sargent (SA).
- B. Standards: Comply with the following:
 - 1. Removable Mullions: BHMA A156.3.
- C. Fire-Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.

2.8 CLOSERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Surface-Mounted Closers (Heavy Duty): BHMA Certified Grade 1.
 - a. Corbin Russwin Hardware (CR) - DC6000 Series with heavy duty arms.
 - b. LCN Door Closers (LC) - 4040 Series with heavy duty arms.
 - c. Norton Door Controls (NO) - 7500 Series with heavy duty arms.
 - d. Sargent Manufacturing (SA) - 351 Series with heavy duty arms.
 - e. Yale Security Group (YA) - 4400 Series with heavy duty arms.

- B. Standards: Comply with the following:
 - 1. Closers: BHMA A156.4.
- C. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide non-handed, factory-sized closers adjustable to meet field conditions and requirements for opening force.
- D. Closer Options: As indicated in hardware sets, provide door closer options including: delayed action, hold open arms, extra duty parallel arms, positive stop/hold open arms, compression stop/hold open arms, special mounting brackets, spacers and drop plates. Through bolt type mounting is required as indicated in the door hardware sets.

2.9 OPERATING and PROTECTIVE TRIM UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Metal Protective Trim Units:
 - a. McKinney Products (MC).
 - b. Hager Companies (HA).
 - c. Rockwood Manufacturing (RO).
 - d. Trimco Manufacturing (TR).
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate protection plates from the following:
 - 1. Brass/Bronze and Stainless Steel: .050 inches thick, beveled four sides (B4E) with countersunk screw holes.
- D. Push-Pull Design: 1" Round with 10" Centers. Provide 90 degree offset pulls at exterior openings.
- E. Fasteners: Provide manufacturer's designated fastener type as indicated in door hardware sets.
- F. Furnish protection plates sized 1-1/2 inches less than door width (LDW) on push side and 1 inch less door width on pull side by height specified in door hardware sets.

2.10 STOPS AND HOLDERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Stops and Holders:
 - a. McKinney Products (MC).
 - b. Hager Companies (HA).
 - c. Rockwood Manufacturing (RO).
 - d. Trimco Manufacturing (TR).
- B. Standards: Comply with the following:
 - 1. Stops and Bumpers: BHMA A156.16.
 - 2. Combination Overhead Holders and Stops: BHMA A156.8.
 - 3. Door Silencers: BHMA A156.16.
- C. Stops and Bumpers: BHMA Certified Grade 1.
- D. Combination Overhead Stops and Holders: Certified BHMA Grade 1.
 - 1. Rixson Hardware (RX)

2. Sargent Hardware (SA)
3. Glynn Johnson (GJ)
- E. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
 1. Where floor or wall stops are not appropriate, provide overhead stops.
- F. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch fabricated for drilled-in application to frame. Provide (3) per single door and (2) per paired door frame if applied gasketing is not specified in Hardware Sets.

2.11 DOOR THRESHOLDS, WEATHERSTRIPPING AND GASKETING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Door Thresholds, Weatherstripping and Gasket Seals:
 - a. McKinney Weatherstripping Products (MW).
 - b. Hager Companies (HA).
 - c. NGP Manufacturing (NG)
 - d. Pemko Manufacturing (PE).
- B. Standard: Comply with BHMA A156.22.
- C. General: Provide continuous weatherstrip seal on exterior doors and smoke, light, or sound gasketing on interior doors where specified. Provide non-corrosive fasteners for exterior applications.
 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms.
 2. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.
 3. Door Sweep: Apply to bottom of door, forming seal with threshold when door is closed.
- D. 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.
- E. 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. Intumescent Seals and Gasketing: Provide concealed, Category A type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling.

2.12 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.

2.13 FINISHES

- A. Standard: Comply with BHMA A156.18.
- 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.
- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
 - 1. BHMA 600: Primed for painting, over steel base metal.
 - 2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
 - 3. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
 - 4. BHMA 630: Satin stainless steel, over stainless-steel base metal.
 - 5. BHMA 651: Bright chromium plated over nickel, over steel base metal.
 - 6. BHMA 652: Satin chromium plated over nickel, over steel base metal.
 - 7. BHMA 689: Aluminum painted, over any base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, 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. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. 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. Steel Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. 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. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's 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.
 - C. Provide and coordinate concealed wood blocking for wall mount stops as detailed in Door Hardware Schedule.
 - D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. The Contractor shall comply with AIA A201 1997 section 3.3.1 which reads as follows: "The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the contract Documents give other specific instructions concerning these matters."
- B. Field Inspection: Supplier, Installer, Door Hardware Manufacturer will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, 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.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper finish and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DOOR HARDWARE SETS

- A. The hardware sets listed below 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.

SET #1 - Exterior Egress Door

Doors: 202B, 205F

3 Hvy Wgt Hinges SS NRP	T4A3386 4 1/2 X 4 1/2 NRP	32D	MC
1 Rim Exit Device - SB WS	7150 WS	630	YA
1 Exit Device Lever w/ Cyl.	CR626F	626	YA
1 Reg/PA Closer	4400 TBGN	689	YA
1 Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1 Heavy Duty Door Stop	DS08	US32D	MC
1 Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1 Raindrip	MCK346 C x Length Required		MW
1 Door Sweep with Drip	MCK345 AV x Length Required		MW
1 Panic Threshold	MCK2005 AV x Length Required		MW

SET #2 - Exterior Storeroom

Doors: 106A

3 Hvy Wgt Hinges SS NRP	T4A3386 4 1/2 X 4 1/2 NRP	32D	MC
1 Storeroom Lock w/ DB	CRCN 8860FL	626	YA
1 Heavy Duty Door Stop	DS08	US32D	MC
1 Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1 Raindrip	MCK346 C x Length Required		MW
1 Door Sweep with Drip	MCK345 AV x Length Required		MW
1 Panic Threshold	MCK2005 AV x Length Required		MW

SET #3 - Exterior Storeroom Pair

Doors: 103A, 104A

6 BB Hinges SS NRP	TA2314 4 1/2 X 4 1/2 NRP	32D	MC
2 Flush Bolt - Metal Door	FB01M-12	US26D	MC
1 Storeroom Lock w/ DB	CRCN 8860FL	626	YA
2 Heavy Duty Door Stop	DS08	US32D	MC
1 Dust Proof Strike	DPS3	US26D	MC
1 Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1 Raindrip	MCK346 C x Length Required		MW
1 Overlapping T Astragal	MCK355 CS x Height Required		MW
2 Door Sweep with Drip	MCK345 AV x Length Required		MW
1 Panic Threshold	MCK2005 AV x Length Required		MW

SET #4 - Exterior Storeroom Pair - Inswing

Doors: 106E, 106F

6 BB Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
2 Flush Bolt - Metal Door	FB01M-12	US26D	MC
1 Storeroom Lock w/ DB	CRCN 8860FL	626	YA
2 Overhead Stop	9-336	652	RX
1 Dust Proof Strike	DPS3	US26D	MC
1 Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1 Raindrip	MCK346 C x Length Required		MW
1 Overlapping T Astragal	MCK355 CS x Height Required		MW
2 Door Sweep with Drip	MCK345 AV x Length Required		MW
1 Panic Threshold	MCK2005 AV x Length Required		MW

SET #5 - Storeroom - Wall Stop

Doors: 213A, 215B

3 PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1 Storeroom Lock	CRCN 8805FL	626	YA
1 Convex Wall Stop	WS03	US26D	MC
3 Door Silencers	S1M		MC

SET #6 - Storeroom - OH Stop

Doors: 205A

3 PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1 Storeroom Lock	CRCN 8805FL	626	YA
1 Overhead Stop	9-336	652	RX
3 Door Silencers	S1M		MC

SET #7 - Storeroom - Rated - Wall Stop

Doors: 217A

3 BB Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1 Storeroom Lock	CRCN 8805FL	626	YA
1 Reg/PA Closer	4400 TBGN	689	YA
1 Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1 Convex Wall Stop	WS03	US26D	MC
1 Smoke Seal	MCKS88 C (Head and Jambs)		MW

SET #8 - Storeroom Pair - OH Stops

Doors: 205C, 205E

6 PB Hinges NRP	T2714 4 1/2 X 4 1/2 NRP	26D	MC
2 Flush Bolt - Metal Door	FB01M-12	US26D	MC
1 Storeroom Lock	CRCN 8805FL	626	YA
2 Overhead Stop	9-336	652	RX
1 Dust Proof Strike	DPS3	US26D	MC
2 Door Silencers	S1M		MC

SET #9 - Office - Wall Stop

Doors: 204A, 204B, 206A, 207A, 210A, 208A, 209A, 211A, 211B, 212A, 218A, 221A, 224A

3 PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1 Office Lock	CRCN 8809FL	626	YA
1 Convex Wall Stop	WS03	US26D	MC
3 Door Silencers	S1M		MC

SET #10 - Corr/Break - Wall Stop

Doors: 201A, 215A

3 PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1 Classroom Lock	CRCN 8808FL	626	YA
1 Convex Wall Stop	WS03	US26D	MC
3 Door Silencers	S1M		MC

Provide floor stop for door 201A.

SET #11 - Roll Call - OH Stop

Doors: 205D

3 PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1 Classroom Lock	CRCN 8808FL	626	YA
1 Overhead Stop	9-336	652	RX
3 Door Silencers	S1M		MC

SET #12 - Privacy - Floor Stop

Doors: 203A, 220A, 223A

3 PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1 Privacy Set	CRCN 8802FL	626	YA
1 High Dome Floor Stop	FS02	US26D	MC
3 Door Silencers	S1M		MC

SET #13 - Shared Restroom - OH Stop

Doors: 219A, 222A

3 BB Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1 Door Pull	DP603	US32D	MC
1 Closer - Stop Arm	4420 TBGN	689	YA
1 Push Plate - 8 x 16	P055	US32D	MC
1 Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1 Mop Plate	KP50 4" x 1" LDW B4E CSK	US32D	MC
1 Smoke Seal	MCKS88 C (Head and Jambs)		MW

END OF SECTION

SECTION 08800

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows.
 - 2. Doors.
 - 3. Glazed curtain walls.
 - 4. Glazed entrances.
 - 5. Interior borrowed lites.
 - 6. Tempered Glass Doors
 - 7. Tempered Glass Shower Doors.
 - 8. Fire rated glazing as required and indicated on the drawings.

1.2 DEFINITIONS

- A. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- B. Deterioration of Coated Glass: Defects developed from normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- C. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
- D. Deterioration of Laminated Glass: Defects developed from normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.3 PERFORMANCE REQUIREMENTS

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

- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: Not less than wind loads applicable to Project as required by ASCE 7 "Minimum Design Loads for Buildings and Other Structures": Section 6.0 "Wind Loads."
 - b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - c. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow action.
 - d. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
 - e. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.
 - f. Windborne-Debris-Impact-Resistance-Test Performance: Provide glazing for aluminum-framed systems that pass large and small missile-impact tests and cyclic-pressure tests according to the requirements of The International Building Code.
 - C. Provide mirrored glass that will not fail under normal usage. Failure includes glass breakage and deterioration attributable to defective manufacture, fabrication, and installation.
 - D. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
 - E. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
 1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick.
 2. For laminated-glass lites, properties are based on products of construction indicated.
 3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite 6.0 mm thick and a nominal 1/2-inch- (12.7-mm) wide interspace.
 - F. Impact Resistance: System to meet requirements for coastal hurricane missile impact loads.
 1. Glazed aluminum curtain wall up to 30 feet above grade shall be designed for Large Missile Impact (LMI) in accordance with ASTM E 96 and SSTD 12.
 2. Glazed aluminum curtain wall frame 30 feet to 60 feet above grade shall be designed for Small Missile Impact (SMI) in accordance with ASTM E 96 and SSTD 12.
 3. Glazed aluminum curtain wall 60 feet above grade or higher shall be designed for Not Impact Resistant (NIR) in accordance with ASTM E 96 and SSTD 12.

1.4 SUBMITTALS

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

- B. Samples: 12-inch- (300-mm-) square, for each type of glass product indicated, other than monolithic clear float glass.
- C. Glazing Schedule: Use same designations indicated on Drawings.
- D. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer.
- E. Product Test Reports: For each of the following types of glazing products:
 - 1. Tinted/coated float glass.
 - 2. Insulating glass.
 - 3. Glazing sealants.
 - 4. Glazing gaskets.
 - 5. Fire rated glazing.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association's Program.
- B. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing according to ASTM c 1087, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:
- C. Glazing for Fire-Rated Door and Window Assemblies: Glazing for assemblies that comply with NFPA 80 and 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 NFPA 257.
- D. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
 - 1. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.
- E. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA Laminated Division's "Laminated Glass Design Guide" and GANA's "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- F. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.
- G. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- H. Pre-Installation Conference: Conduct pre-installation conference at project site.

1.6 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to Owner and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form, made out to Owner and signed by laminated-glass manufacturer agreeing to replace laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- D. Manufacturer's Special Warranty on Mirrors: Manufacturer's standard form, made out to Owner and signed by mirror manufacturer agreeing to replace mirror units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 5 years from date of Substantial Completion.
- E. Manufacturer's Special Warranty on Fire-Rated Glass: Manufacturer's standard form, made out to Owner and signed by Fire-rated glass manufacturer agreeing to replace Fire-rated glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS

- A. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of Class 1 (clear).
- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, Kind, and HS (heat-strengthened) condition indicated.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
 - 2. For uncoated glass, comply with requirements for Condition A.
 - 3. Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heat-strengthened) float glass where safety glass is indicated.
- C. Mirrors: ASTM C 1036, Type I, Class 1, Quality q2, nominal ¼-inch thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411. Mount mirrors level with Zinc plated Vancouver mirror clips by C.R. Lawrence Co.; Inc or equal.
- D. Laminated Glass: ASTM C 1172, and complying with other requirements specified and with the following:
 - 1. Interlayer: Manufacturer's standard of required thickness with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

- E. Tempered Glass: ASTM C 1048, Kind FT (Fully tempered), Type I (Transparent flat glass) Quality-Q-1, Class I (clear).
 - 1. Safety glazing locations are defined by the International Building Code for specific required locations.
 - 2. Where safety glass is required, tempered glass shall comply with ANSI Z97.1 and 16 CFR Part 1201, Category II.
- F. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified. Insulated units shall comply with impact rated glazing.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary.
 - 2. Spacer: Manufacturer's standard spacer material and construction.
 - 3. Desiccant: Molecular sieve or silica gel, or blend of both.
- G. Tempered Glass Doors: Glass shower doors shall be 1/2-inch thick satin etched tempered glass.
 - 1. Manufacturer:
 - a. Blumcraft of Pittsburgh; Series 1301
 - b. Prior approved equal.
 - 2. Tempered Patterned Glass: ASTM C 1048, Kind FT (fully tempered), Type II (patterned flat glass), Quality-Q5; and of finish and pattern specified.
 - 3. Provide overhead closer, locking mechanism CH-850 and lock shall be thumb turn on inside and key cylinder on outside.
 - 4. Door pulls shall be Hafele 115.70.005.
 - 5. Size: 36-inches wide by 7 feet high.

2.2 FIRE-RATED GLAZING PRODUCTS

- A. Fire-Protection Rating: 20 minute to 90 minute fire-rating, as indicated for the assembly in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Supplier: FireLite Plus as supplied by Technical Glass Products.
 - 1. Prior approved equal.
- C. Properties:
 - 1. Thickness: 5/16-inch.
 - 2. Weight: 4 pounds per square feet
 - 3. Impact safety resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II)
 - 4. Fire Rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications.
 - 5. Surface Finish: Premium (unpolished).
 - 6. Laminated Fire-rated and impact safety rated glazing.
- D. Labeling: Permanently label each piece of FireLite Plus with the FireLite Logo, UL logo and fire rating in sizes up to 3,325 sq. inch, and with the FireLite label only for sizes that exceed the listing (as approved by the local authority having jurisdiction).
- E. Fire Rating: Fire rating listed and labeled by UL for fire rating scheduled at opening on drawings, when tested in accordance with ASTM E2074, ASTM E2010, NFPA 252, NFPA 257, UL 9, UL 10B and UL 10C.
- F. Glazing compound for Fire-Rated Glazing Materials:
 - 1. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.

2. Glazing compound: As recommended per manufacturer.
3. Silicon Sealant: Provide one part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression; Use exposure NT; substrate G, A and O.
- G. Setting Blocks: Neoprene, EPDM, or silicone: tested for compatibility with glazing compound, of 70 to 90 Shore A Hardness.
- H. Cleaners, Primers and Sealers: Type recommended by manufacturer of glass and gaskets.
- I. Fabrication:
 1. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with system performance requirements.
- J. Installation: Install per manufacturer's recommendations.

2.3 GLAZING GASKETS

Lock-Strip Gaskets: Aluminum door and window manufacturer's standard extrusions in size and shape required, fabricated into frames with molded corner units and lock strips, complying with ASTM C 542, black.

- A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
 1. Neoprene, ASTM C 864.
 2. EPDM, ASTM C 864.
 3. Silicone, ASTM C 1115.
 4. Thermoplastic polyolefin rubber, ASTM c 1115.
 5. Any material indicated above.

2.4 GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
 1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Elastomeric Glazing Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- C. Glazing Sealants for Fire-Resistive Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.
- D. Refer to Division 07 Section "Joint Sealant" for specific sealants.

2.5 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; non-staining and non-migrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.6 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type C (closed-cell material with a surface skin)), polyurethane foam rod, oversized 20 to 50 percent larger than joint width, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control glazing sealant depth and otherwise contribute to producing optimum sealant performance.
- G. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.
- H. Edge Sealer (Mirrored Glass): Coating compatible with glass coating and approved by mirrored glass manufacturer for use in protecting against silver deterioration at mirrored glass edges.

2.7 MIRROR INSTALLATION MATERIALS

- A. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrored glass by spot application, certified by both mirrored glass manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrored glass will be installed.
1. Available Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Palmer Products Corporation; Mirro-Mastic Adhesive; Mirro-Mastic Bond Primer, and Mirro-Bac Paint Sealer.
 - b. Gunther Mirror Mastics; Ultra-Bond Adhesive, Prime-N-Seal Primer, and Seal Quick Edge Sealer.
- B. Fasteners (Mirrored Glass): Fabricated of zinc plated steel and height adjustable slots.
1. C. R. Laurence Co., Inc.; Zinc plated Vancouver Clip for 5 mm mirror thickness.

- C. Anchors and Inserts (Mirrored Glass): Provide devices as required for mirror hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors or inserts for applications on inside face of exterior walls and where indicated.

2.8 FABRICATION OF GLAZING UNITS

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

PART 3 - EXECUTION

3.1 GLAZING

- A. General: Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
 - 1. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
 - 2. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
 - 3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
 - 4. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
 - 5. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
 - 6. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 7. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- B. Tape Glazing: Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
 - 1. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
 - 2. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
 - 3. Apply heel bead of elastomeric sealant.

4. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
5. Apply cap bead of elastomeric sealant over exposed edge of tape.
- C. Gasket Glazing (Dry): Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
 1. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
 2. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weather tight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
 3. Install gaskets so they protrude past face of glazing stops.
- D. Sealant Glazing (Wet): Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
 1. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
 2. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.2 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
- B. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

3.3 GLASS SCHEDULE

- A. Type "A"; All exterior curtain wall framing for safety glazing requirements. Provide impact rated glazing as required per The International Building Code. All exterior shall comply with the Large Missile Impact testing.
 1. Nominal: 9/16-inch thick impact rated laminated glass unit:
 - a. Exterior pane 1/4 inch thick laminated Low E float glass.
 - b. 0.090-inch thick Interlayer to comply with Impact and wind requirements of the International Building Code.
 - c. Interior pane 1/4 inch thick laminated clear float glass.
 2. Manufacturers: Viracon; PPG or prior approved equal.

- B. Type "B"; All exterior doors. Provide impact rated glazing as required per The International Building Code. All exterior shall comply with the Large Missile Impact testing.
 - 1. Nominal: 9/16-inch thick laminated glass unit:
 - a. Exterior pane 1/4 inch thick laminated Low E float glass.
 - b. 0.090-inch thick Interlayer to comply with Impact and wind requirements of the International Building Code.
 - c. Interior pane 1/4 inch thick laminated clear float glass.
 - 2. Manufacturers: Viracon; PPG or prior approved equal.

- C. Type "C"; Exterior metal wall panel assembly system, including windows within system. Provide impact rated glazing as required per The International Building Code. All exterior shall comply with the Large Missile Impact testing. Coordinate glazing with metal wall panel assembly system.
 - 1. Nominal: 1-3/32-inch (1-15/16-inch) thick laminated impact rated insulated glass unit:
 - a. 1/4 inch thick laminated Low E float glass.
 - b. 1/2-inch airspace.
 - c. 1/4 inch thick laminated float glass.
 - d. 0.090-inch thick Interlayer to comply with Impact and wind requirements of the International Building Code.
 - e. 1/4 inch thick clear float glass.
 - 2. Basis-of-design: Viracon; PPG or prior approved equal.

- D. Type "D"; All interior non-fire rated locations.
 - 1. Nominal 1/4 inch thick clear fully tempered float glass.

- E. Type "E"; Provide Mirror glass as indicated on drawings.
 - 1. See Paragraph 2.1 for Mirror glass requirements.

- F. Type "F"; Provide tempered glass shower doors as indicated on drawings and as specified.

- G. Type "G"; Provide Fire rated glass as indicated on drawings.
 - 1. See Paragraph 2.2 for Fire Rated Glazing Products requirements.

END OF SECTION

SECTION 08920

GLAZED ALUMINUM CURTAIN WALL ASSEMBLY AND WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes conventionally glazed aluminum curtain walls, complete with reinforcing, shims, anchors and attachment devices. Provide accessories necessary to complete work.
 - 1. Glazed Curtain Wall Framing and Windows.
 - 2. Glazed Entrance System.
- B. Related Sections:
 - 1. Section 08800 - Glazing.
 - 2. Section 10710 - Hurricane shutters for hurricane protection fabric screen system over entrance door to comply with the International Building Code and local jurisdictions.

1.2 SYSTEM REQUIREMENTS

- A. General: In addition to the requirements shown or specified, comply with applicable provisions of Aluminum Curtain Wall Design Guide Manual for design, materials, fabrication and installation of component parts.
- B. Design Requirements:
 - 1. Provide metal stick framed systems with interior and exterior exposed metal framing.
 - 2. System manufacturer shall provide curtain wall systems, including necessary modifications to meet specified requirements and maintaining visual design concepts.
 - 3. Fabricate glazing system for exterior glazing at vision areas.
 - 4. Perimeter conditions shall allow for installation tolerances, expansion and contraction of adjacent materials, and sealant manufacturer's recommended joint design.
 - 5. Assemblies shall be free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
 - 6. System shall drain to the exterior of system any water entering system.

1.3 PERFORMANCE REQUIREMENTS

- A. Performance Requirements:
 - 1. Air Infiltration: Air leakage shall not exceed 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of surface area when tested according to ASTM E 283 at a minimum differential static-pressure of 6.24 lbf/sq. ft. (300 Pa).
 - 2. Water Infiltration: NO uncontrolled water penetration when tested according to ASTM E 331 at a pressure of 20 percent of full positive design wind load, but not less than 10 lbf/sq. ft. (479 Pa).

3. Three field water tests conforming to AAMA 501.3-94 (Field check of water leakage through installed exterior curtain walls, by uniform air pressure difference of 12 lbf/ft). Tests will be performed at 10% completion, 30% completion, and 80% completion of curtain wall installation. Test area will be approximately 8 feet wide by 8 feet tall - as selected by the architect. If leakage occurs, corrections in wall design and/or installation procedures shall be made to eliminate the leakage problem. Each test will be repeated until is passed.
 4. Framing and glass must meet large missile impact criteria as required by the Standard building Cod SSTD 12-94 for determining impact resistance form windborne debris.
- B. Design Loads for wall panel system, components and cladding wind loads determined in accordance with ASCE 7-05, ASTM E 1996 and tested to Level E Projectiles for the parameters specified.
1. Importance Factor: 1.15
 2. Occupancy Category: Category IV
 3. Basic Wind Speed: 130 miles per hour.
 4. Comply with the Large Missile Impact requirements.
 5. Deflection under uniform loading: When testing in accordance with ASTM E330 at design pressure, maximum deflection of exterior member shall not exceed 1/175 of span.

1.4 SUBMITTALS

- A. Product Data: For each product indicated, including factory finishes, accessories and other required components.
- B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of glazed aluminum curtain-wall systems.
 1. Include structural analysis data signed and sealed by the qualified professional engineer licensed in the State of Louisiana responsible for their preparation.
- C. Samples: For each exposed finish.
- D. Product test reports.
- E. Field quality-control test reports: Submit manufacturer's certification stating that installed system is in compliance with specified requirements.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Acceptable to manufacturer and capable of preparing data for glazed aluminum curtain-wall systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Single Source Responsibility: To ensure quality of appearance and performance, obtain materials for each system from either a single manufacturer or from manufacturer approved by each system manufacturer.
- C. Pre-installation Conference: Conduct conference at Project site.

1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of glazed aluminum curtain-wall systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.
 - 1. Warranty shall cover the following:
 - a. Complete water tight and air tight system installation within specified tolerances.
 - b. Completed installation will remain free from rattles, wind whistles and noise due to thermal and wind pressures.
 - c. System is structurally sound and free from distortion.
 - d. Glass and glazing gaskets will not break or pop from frames due to design windload pressure, expansion or contraction movement, or structural loading.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Curtain Wall Framing and Windows:
 - a. Kawneer; Custom 1600 wall system (3-inch by 6-1/2-inch)
 - b. Southern Walls
 - c. YKK AP
 - 2. Entrance: Refer Section 10710 - Hurricane Shutter System for entrance door requirements.
 - a. Kawneer; IR 350 (1-3/4-inch deep with 3-1/2-inch vertical stiles and top rails and 10-inch bottom rail.)
 - b. Southern Walls.
 - c. YKK AP

2.2 FRAMING SYSTEMS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 (ASTM B 221M).
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 611.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.

- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads.
 - 4. Finish exposed portions to match framing system.
 - 5. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
- E. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- G. Framing Gaskets and Sealants: As recommended by manufacturer for joint type.

2.3 GLAZING SYSTEMS

- A. Glazing: As specified in Division 08 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer for joint type.

2.4 ACCESSORY MATERIALS

- A. Perimeter Fire-Containment Systems (Safing Insulation): Specified in Division 07 Section "Building Insulation."
- B. Insulating Materials: Specified in Division 07 Section "Building Insulation."
- C. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.5 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
 - 1. Sharp profiles, straight and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.

6. Provisions for reglazing from interior for vision glass.
- C. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- D. Factory-Assembled Frame Units:
 1. Rigidly secure nonmovement joints.
 2. Seal joints watertight, unless otherwise indicated.
 3. Pressure equalize system at its interior face.
 4. Install glazing to comply with requirements in Division 08 Section "Glazing."
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.6 ALUMINUM FINISHES

- A. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: Nonspecular as fabricated; Chemical finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Fit joints to produce hairline joints free of burrs and distortion.
 2. Rigidly secure nonmovement joints.
 3. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 4. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
 5. Seal joints watertight, unless otherwise indicated.
- B. Metal Protection:
 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install glazing as specified Division 08 Section "Glazing."
- F. Install sealants as specified in Division 07 Section "Joint Sealants."
- G. Install insulation materials as specified in Division 07 Section "Building Insulation."
- H. Install perimeter fire-containment systems (safing insulation) as specified in Division 07 Section "Building Insulation."
- I. Erection Tolerances: Install glazed aluminum curtain-wall systems to comply with the following maximum tolerances:
 1. Plumb: 1/8 inch in 10 feet (3 mm in 3 m); 1/4 inch in 40 feet (6 mm in 12 m).
 2. Level: 1/8 inch in 20 feet (3 mm in 6 m); 1/4 inch in 40 feet (6 mm in 12 m).

3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (13 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (13 to 25 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
 - c. Where surfaces are separated by reveal or protruding element of 1 inch (25 mm) wide or greater, limit offset from true alignment to 1/4 inch (6 mm).
4. Location: Limit variation from plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/2 inch (12.7 mm) over total length.

3.2 FIELD QUALITY CONTROL

- A. Water Spray Test: After the installation of minimum area of 75-foot- (23-m-) by-2-story glazed aluminum curtain-wall system has been completed but before installation of interior finishes has begun, test a 2-bay area of system designated by Architect according to AAMA 501.2.
 1. Repair or remove work where test results indicate water penetration of systems.
 2. Perform additional testing to determine resistance to water penetration of replaced or additional work.

END OF SECTION

SECTION 08953

OPENINGS FLOOD VENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Certified Flood Vents specified or indicated on the drawings.

1.2 REFERENCES

- A. American Society of Civil Engineers (ASCE)
1. ASCE/SEI 24-98, Flood Resistant Design and Construction, Latest
 2. ASCE/SEI 24-05, Flood Resistant Design and Construction, Latest
- B. Federal Emergency Management Agency (FEMA)
1. FEMA, 44-CFR, Part 59-60 and 60.3 National Flood Insurance Program (NFIP), latest.
- C. Federal Emergency Management Agency, Federal Insurance Administration (FEMA/FIA)
1. FEMA/FIA-TB 1-2008, Openings in Foundation Walls and Walls of Enclosures for Buildings Located in Special Flood Hazard Areas, Latest
- D. International Code Council National Evaluation Service (NES)
1. NER-624, National Evaluation Report No. NER-624. July 2007
- E. International Code Council National Evaluation Service (NES)
1. ESR-2074, National Evaluation Report No. ESR-2074. February 2008
- F. International Code Council ICC-ES Acceptance Criteria for Automatic Foundation Flood Vents (AC-364). October 2007
- G. Federal Emergency Management Association's MEMO W-08-001. January 2008
- H. International Building Code, Latest
- I. Governing Codes: Where conflict occurs between above codes and standards, the most stringent requirements governs.

1.3 SUBMITTALS

- A. A complete and detailed description of all Foundation Vents shall be submitted with all pertinent data from the NES Testing Service showing the vents are Certified. Catalog cuts and drawings shall be submitted as well as installation instructions.

1.4 WARRANTY

- A. Any and all vents manufactured shall be subject to a one year limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Products listed are manufactured by the following:
1. Smart VENT, Inc.
 2. Prior Approved Equal.

2.2 GENERAL

- A. Items are specified by use of manufacturer's catalog numbers. Vents by other named manufacturers are still required to meet all the criteria listed for the product and will be reviewed for acceptance against specified items.

2.3 MATERIALS

A. General:

1. Vents shall be constructed of Stainless Steel formed and smooth-welded construction. The frame shall be rigid and designed to be installed in masonry or framed walls, stud walls or garage doors that range in thickness from 2" to 16". It shall have a pivoting door assembly that is fitted with two patented sealed floats that immediately and automatically release the door upon contact with rising water to relieve unbalanced lateral forces on foundation walls. The door shall swing open to provide two horizontal slot openings with a total combined unobstructed area of 76 square inches. The lower slot provides a 3" clear opening. One Single unit shall be used to relieve 200 square feet of enclosed area. The Double or "Stacking Model" shall be used to relieve 400 square feet of enclosed area per unit.

B. Flood Vent Types:

1. Ventilated with Louvered Blades and Screen. The louvered blades are temperature controlled with a bimetal coil and the screen is vermin resistant:

Smart VENT Model # 1540-510

2. Flush or Solid Insulated Door:

Flood VENT Model # 1540-520

3. Accessories:

- a. 8" -12" Adjustable Sleeve/Trim #1540-531-12
- b. 12" -15" Adjustable Sleeve/Trim #1540-531-15
- c. 8" -12" Sleeve Only #1540-532-12
- d. 12" -15" Sleeve Only #1540-532-15
- e. 16" x 16" x 6" adjustable sleeve 6" to 9" wall thickness #1540-531-Stacker
(Note: Sleeves should be used in 'un-filled' masonry
Fire Walls and where 'air-space' is required on Exterior Walls)
- f. Interior Trim Flange #1540-533
- g. Interior Trim Flange #1540-573
- h. Interior Trim Flange/Sleeve #1540-573-9
- i. Vinyl Buck(s) #1540-800 Series
For poured concrete walls Sizes range from 5.5" to 12"
Specify wall thickness for exact or nominal sizes
Use in conjunction with SV models #1540-510 or #1540-520 encased in Buck
- j. Vinyl Buck Extension #1540-800 - 2"
- k. Powder-Coating #38/10130 - Black, White, Gray, or Wheat
Check with Factory for availability of other colors.

C. Openings Size Requirements (RWO):

1. Single units can be installed in an 8 ¼" x 16 ¼" opening or 8 ¾" x 14 ½" opening.
2. Double units require a 16 ¼" x 16 • " opening.
3. Quad Units require a 33" x 16 • " opening.
4. Designed to fit openings in modular masonry construction; and can easily be adapted to framed walls or garage doors

- D. Natural Ventilation:
 - 1. Free Area (Natural Ventilation): Screen shall have ¼ inch x ¼ inch (6.35mm x 6.35mm) square perforations.
 - 2. Single models #1540-510 and #1540- 514 each yield 51 square inches (32.903 sq. mm) of net free area to supply natural ventilation.
 - 3. Stacking models #1540-511 yield 102 square inches (65.806 sq. mm) of natural ventilation.
- E. Flood Relief:
 - 1. There shall be a minimum of two vents on different sides of each enclosed area.
 - 2. Single models #1540-510, #1540-514, #1540-520, #1540-524, 1540-570, and #1540-574 shall each disperse 200 sq. ft. (18.6 sq. m) of water in an enclosed area.
 - 3. Stacking models #1540-511, and #1540-521 shall each disperse 400 sq. ft. (37.2 sq. m) of water in an enclosed area.
 - 4. The Quad models #1540-550 (2 ea #1540-511) and #1540-560 (2 ea. #1540-521) shall each disperse 800 sq. ft. (74.4 sq. m) of water in an enclosed area.
- F. Installation:
 - 1. Stainless Steel straps, four for each vent, and masonry or concrete Urethane base adhesive.
 - 2. Adjustable wrench for thru-bolted models and screwdriver for stud wall models.
 - 3. NOTE: caulk may be used to seal certain areas that require extra attention; but, only Fire-Rated caulk shall be used on Fire-Rated walls or openings.
- G. Maintenance Tools: Follow Smart VENT Manufacturer's Maintenance Procedure
 - 1. Requires thin blade to release float pins.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General Contractor to verify vents are ready to receive work, and dimensions are as indicated on shop drawings or as instructed by manufacturers.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. General:
 - 1. Install each vent in accordance with manufacturer's instructions and recommendations spaced evenly around foundation perimeter, maximum 12 inches above grade to bottom of vent.
 - 2. Install one single height flood vent for every 200 sq. ft. of enclosed space below floodplain.
 - 3. Install one double height flood vent for every 400 sq. ft. of enclosed space below floodplain.
 - 4. Install one quad flood vent for every 800 sq. ft. of enclosed space below floodplain.
 - 5. Adjust flood vents for proper operation.

END OF SECTION

