

February 14, 2020

**SECTION 08 11 13**  
**HOLLOW METAL DOORS AND FRAMES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal doors and frames.
- B. Accessories, including glazing, louvers, and matching panels.

**1.02 ABBREVIATIONS AND ACRONYMS**

- A. ANSI - American National Standards Institute.
- B. NAAMM - National Association of Architectural Metal Manufacturers.
- C. NFPA - National Fire Protection Association.
- D. SDI - Steel Door Institute.
- E. UL - Underwriters Laboratories.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2016.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2017.
- I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- M. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- O. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.

**1.04 SUBMITTALS**

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

February 14, 2020

- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.
- C. Brace the bottom ends of frames against displacement.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Hollow Metal Doors and Frames:
  - 1. Curries, an Assa Abloy Group company: [www.assaabloydss.com](http://www.assaabloydss.com).
  - 2. Steelcraft, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  - 3. Stiles Custom Metal, Inc: [www.stilesdoor.com](http://www.stilesdoor.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.02 DESIGN CRITERIA**

- A. Requirements for Hollow Metal Doors and Frames:
  - 1. Steel used for fabrication of doors and frames to comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
  - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
  - 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
  - 4. Door Edge Profile: Manufacturers standard for application indicated.
  - 5. Typical Door Face Sheets: Flush.
  - 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
  - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
  - 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    - a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
- B. Hollow Metal Panels: Same construction, performance, and finish as doors.
- C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the

February 14, 2020

requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

## **2.03 HOLLOW METAL DOORS**

- A. Door Finish: Factory primed and field finished.
- B. Interior Doors:
  - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    - a. Level 2 - Heavy-duty.
    - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    - c. Model 1 - Full Flush.
    - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
    - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
  - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
  - 3. Door Thickness: 1-3/4 inch, nominal.
  - 4. Door Face Sheets: Flush.
  - 5. Door Finish: Factory primed and field finished.

## **2.04 HOLLOW METAL FRAMES**

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
- C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
  - 1. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
- D. Silencers: Frames to be drilled for silencers; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- E. Hardware Reinforcing: SDI 100/ANSI 250.6, SDI-111H, example "A" at all hinge locations. SDI-111-H, example "B" and manufacturers alternative methods are not acceptable.

## **2.05 FINISHES**

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Paint: Refer to 09 91 23, Interior Painting.

## **2.06 ACCESSORIES**

- A. Glazing: As specified in Section 08 80 00.
- B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered corners; prepared for countersink style tamper proof screws.
- C. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
- D. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- E. Silencers: As specified in Section 08 71 00 - Door Hardware, fitted into drilled holes in frames.
- F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

February 14, 2020

### **3.02 PREPARATION**

### **3.03 INSTALLATION**

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Install door hardware as specified in Section 08 71 00.
  - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- D. Comply with glazing installation requirements of Section 08 80 00.
- E. Coordinate installation of electrical connections to electrical hardware items.
- F. Touch up damaged factory finishes.

### **3.04 TOLERANCES**

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

### **3.05 ADJUSTING**

- A. Adjust for smooth, balanced door movement and proper latching.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.
- C. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

### **3.06 SCHEDULE**

- A. Refer to Door and Frame Schedule on the drawings.

**END OF SECTION**

**SECTION 08 71 00**  
**DOOR HARDWARE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Hardware for wood, aluminum, and hollow metal doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Thresholds.
- E. Weatherstripping, seals and door gaskets.

**1.02 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. BHMA A156.1 - American National Standard for Butts and Hinges; 2016.
- D. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.
- E. BHMA A156.7 - American National Standard for Template Hinge Dimensions; 2016.
- F. BHMA A156.21 - American National Standard for Thresholds; 2014.
- G. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association; 2017.
- H. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.
- I. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- K. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware will be installed upon.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Convey Owner's keying requirements to manufacturers.
- D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

**1.04 SUBMITTALS**

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.
- C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door, including manufacturer, product designation and finish. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
- D. Wiring Diagrams: For electrically operated items, submit wiring diagrams.

- E. Keying Schedule: Developed with the Owner, submit for approval of Owner.
- F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
  - 1. Include final Hardware and Keying Schedule.
- G. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with a minimum of five years of experience supplying the Work of this Section in the Project Area. The supplier to maintain a parts inventory of items supplied for this Project, for future service of the Owner.
- B. Hardware Supplier Personnel: Employ a competent architectural hardware consultant to assist in the work of this section.
  - 1. Consultant to be knowledgeable regarding applicable life safety, accessibility and governing jurisdiction codes and requirements.
  - 2. Consultant to be readily available for consultation with Architect, Owner and Contractor.
  - 3. Consultant to obtain keying in meeting with Owner.
  - 4. Consultant to make one final inspection to see that all hardware has been properly installed, according to manufacturer's recommendations and to provide a letter certifying such.

#### **1.06 WARRANTY**

- A. See Section 01 70 00 - Execution and Closeout Requirements, for additional warranty requirements.
- B. Provide thirty year warranty for door closers, five year warranty for locksets, and three year warranty for panic hardware.

### **PART 2 PRODUCTS**

#### **2.01 DOOR HARDWARE SUPPLIERS**

- A. American Direct: [www.americandirectco.com](http://www.americandirectco.com).
- B. Bell Hardware: [www.bellhardware.com](http://www.bellhardware.com).
- C. Chown Hardware: [www.chownhardware.com](http://www.chownhardware.com).
- D. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.02 MANUFACTURERS - BASIS OF DESIGN**

- A. As specified in attached Hardware Schedule.
- B. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.03 GENERAL REQUIREMENTS**

- A. Provide door hardware specified, or as required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
- B. Provide products that comply with the following:
  - 1. Applicable provisions of federal, state, and local codes.
  - 2. Accessibility: ADA Standards and ICC A117.1.
  - 3. Applicable provisions of NFPA 101, Life Safety Code.
  - 4. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
- C. Function: Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware schedule.

- D. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.
- E. Finishes: Identified in schedule.
- F. Fasteners:
  - 1. Mineral Core Wood Doors: Sex bolts.
  - 2. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

#### **2.04 HINGES**

- A. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7; standard weight, unless otherwise indicated.
  - 1. Provide hinge width required to clear surrounding trim or other conditions to allow maximum degree of opening.
- B. Quantity of Hinges Per Door:
  - 1. Doors up to 60 inches High: Two hinges.
  - 2. Doors From 60 inches High up to 90 inches High: Three hinges.
  - 3. Doors 90 inches High up to 120 inches High: Four hinges.
- C. Manufacturers - Hinges:
  - 1. Bommer Industries, Inc; \_\_\_\_\_: [www.bommer.com](http://www.bommer.com).
  - 2. Ives, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  - 3. Stanley Black & Decker: [www.stanleyblackanddecker.com](http://www.stanleyblackanddecker.com).
  - 4. McKinney Hinges: [www.mckinneyhinge.com](http://www.mckinneyhinge.com)
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.05 KEYING**

- A. Key into existing Schlage Everest 29T Grand Master Key System for this project. All locksets and cylinders specified under this Section shall be keyed to the new system.
- B. Provide construction cores and keys during the construction period. Plastic construction cores are unacceptable.
- C. The Owner shall approve or modify the keying schedule and provide the key bittings.
- D. The permanent cylinders, change keys, and control keys, prepared according to the approved keying schedule and bitting, shall be transmitted directly from the manufacturer to the Owner prior to substantial completion. The Owner shall remove the construction cylinders and install the permanent cylinders. All construction cylinders shall be returned to the finish hardware supplier.
- E. All permanent cores and keys shall be sent direct from the lock manufacturer via registered mail, return receipt requested.
- F. Stamp all keys with change designation as directed.
- G. Furnish:
  - 1. Twenty (20) Building Master Keys
  - 2. Two (2) Change Keys per cylinder.
  - 3. Ten (10) Construction Keys.

#### **2.06 EXIT DEVICES**

- A. Size exit devices in accordance with manufacturer's recommendations.
- B. Provide UL listed fire exit hardware at rated openings.
- C. Provide mullion angle brackets for installation at narrow stop frames.
- D. Provide glass bead kits where interference with door vision frame occurs.
- E. End cap shall be cast and flush.

- F. Shall have hydraulic sound dampener.
- G. All latchbolts shall be deadlocking.
- H. All strikes to be roller type.
- I. Manufacturers - Exit Devices:
  - 1. Von Duprin, an Allegion brand; \_\_\_\_\_: [www.allegion.com/us](http://www.allegion.com/us).
  - 2. Substitutions: Not permitted - owner standard.

## **2.07 POWER TRANSFERS**

- A. Manufacturers - Power Transfers, Power Supplies:
  - 1. Von Duprin, an Allegion Brand: [www.allegion.com/us](http://www.allegion.com/us)

## **2.08 CLOSERS**

- A. Closers: Complying with BHMA A156.4.
  - 1. Closers to have a cast iron body, and shall not include any internal debris screens or pressure relief valves. Furnish heavy-duty arms where specified.
  - 2. Except for closer models specifically specified with an integral spring stop-on-the-arm feature, operation to be maximum degree of opening as building configuration will permit. Door swing symbol indicated on Drawings is not intended to limit swing.
  - 3. Furnish drop plates where doors have insufficient width of top stile, or where regular arm closers are used in conjunction with concealed overhead stops.
  - 4. Provide non-standard closer mounting as required where interference with weatherstripping or seals occurs.
  - 5. Furnish cold-weather grade fluid at any closers at exterior and vestibule doors.
  - 6. Furnish spacer blocks and/or shoe supports where frame stop does not provide for adequate support for the parallel arm shoe.
  - 7. Furnish fifth hole spacers or shoe supports where required by frame configuration.
  - 8. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
  - 9. Closers shall be handled for the specific application and not a universal mounting type.
  - 10. Pressure relief valves and filter screens are not permitted.
  - 11. Closer arms shall be heavy duty as specified in the hardware sets.
  - 12. All closers shall be cast iron.
- B. Manufacturers - Surface Mounted Closers:
  - 1. LCN, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  - 2. Substitutions: Not permitted - owner standard.

## **2.09 AUTOMATIC OPERATORS**

- A. All system wiring to be concealed within door frame and surrounding wall construction. Surface mounted wire-mold or conduit is not acceptable.
- B. Coordinate rough-in locations, voltage and wiring requirements with Electrical Contractor.
- C. Provide blocking for space between operator back plate and face frame as required.
- D. Manufacturers - Automatic Operators:
  - 1. LCN, an Allegion Brand: [www.allegion.com/us](http://www.allegion.com/us)
  - 2. Substitutions: Not permitted - owner standard.

## **2.10 ACTUATOR SWITCHES**

- A. Locate actuator wall plates and switches as noted in the Architectural Drawings, or as directed by the Architect.
- B. Manufacturers - Actuator Switches:
  - 1. LCN, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  - 2. Substitutions: Not permitted - owner standard.



## 2.11 STOPS AND HOLDERS

- A. Stops: Complying with BHMA A156.8:
  - 1. If wall stops are not practical, due to configuration of room or furnishings, provide floor stops or overhead stop if required.
  - 2. Furnish overhead stops and holders with shims, brackets or special non-standard template mounting where required.
  - 3. Locate stops to provide maximum degree of opening as building configuration will permit. Door swing symbol indicated on Drawings is not intended to limit swing.
- B. Overhead Holders/Stops: Furnish overhead stops and holders sized as recommended by the Manufacturer.
- C. Manufacturers - Wall and Floor Stops/Holders:
  - 1. Ives, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  - 2. Trimco, Inc: [www.trimcohardware.com](http://www.trimcohardware.com).
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.12 GASKETING AND THRESHOLDS

- A. Gaskets: Complying with BHMA A156.22.
  - 1. On each exterior door, provide weatherstripping gaskets, unless specifically noted to be furnished in Door Section; install complete perimeter of top, sides, and meeting stiles of pairs.
  - 2. On each exterior door, provide door bottom sweep, unless otherwise indicated.
  - 3. Furnish door silencers for interior openings not specified to receive weatherstripping, gasketing or seals. Provide quantity scheduled. If not indicated in schedule, provide quantity indicated in Door Frame Section.
- B. Thresholds: Complying with BHMA A156.21.
  - 1. At each exterior door, provide a threshold unless otherwise indicated.
  - 2. Field cut threshold to frame for tight fit.
  - 3. Set exterior thresholds in a full bed of sealant. Remove excess sealant, caulk edges and joints.
- C. Fasteners At Exterior Locations: Non-corroding.
  - 1. At thresholds, provide 1/4 20x2 flat head sleeve anchors.
- D. Manufacturers - Gasketing and Thresholds:
  - 1. National Guard Products, Inc: [www.ngpinc.com](http://www.ngpinc.com).
  - 2. Pemko Manufacturing Co: [www.pemko.com](http://www.pemko.com).
  - 3. Zero International, Inc; \_\_\_\_\_: [www.zerointernational.com](http://www.zerointernational.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.13 PROTECTION PLATES AND ARCHITECTURAL TRIM

- A. Protection Plates:
  - 1. Kickplate: Provide on push side of every door with closer, except aluminum storefront and glass entry doors.
  - 2. Kickplates and armor plates to be installed on push side of door.
  - 3. Plates shall be beveled four edges and countersunk for screws.
  - 4. Height: Kick Plates, 10-inches.
  - 5. Plates shall be furnished with width as required to provide 1/4-inch clearance at sides of doors, stops, sound seal, or weatherstrip.
- B. Manufacturers - Protection Plates:
  - 1. Ives, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  - 2. Tice Industries, Inc: [www.ticeindustries.com](http://www.ticeindustries.com).
  - 3. Trimco Hardware: [www.trimcohardware.com](http://www.trimcohardware.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that blocking has been installed for wall-mounted components.
- C. Verify that electric power is available to power operated devices and of the correct characteristics.

#### **3.02 INSTALLATION**

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Do not install surface mounted items until finishes applied to substrate are complete. Doors, frames and substrates to receive adhesive-applied hardware and accessories to be thoroughly cleaned.
- D. Install using fasteners specified for specific conditions, or if not specified in accordance with manufacturer's installation instructions for condition. Self-tapping sheet metal screws are not acceptable.
- E. Mount and adjust rigid jamb weatherstripping prior to mounting parallel arm door closers. Provide a continuous seal at head and jambs. Do not notch weatherstrip for door closer shoe. Provide parallel arm fifth hole spacer of increased thickness to allow for revised location.
- F. Mounting heights for hardware from finished floor to center line of hardware item. As indicated in the following list; unless noted otherwise in Door Hardware Sets Schedule or on the drawings.
  - 1. For steel doors and frames: Comply with DHI (LOCS) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
  - 2. For Wood Doors: Comply with DHI WDHS.3 "Recommended Locations for Architectural Hardware for Flush Wood Doors".
  - 3. Lock Strikes: 39 inch.
  - 4. Push/Pulls: 42 inch.
  - 5. Wall stops: Located such that centerline of lever, spindle or pull resting against stop is aligned with centerline of stop.
  - 6. Floor stops: Located no more than 1/3 door width from latch edge of door. Ensure that location of stop is not creating a tripping hazard.
  - 7. Automatic operator actuator switches: 36 inch.
- G. Set exterior door thresholds with full-width bead of elastomeric sealant on each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

#### **3.03 FIELD QUALITY CONTROL**

- A. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.
  - 1. In the event that hardware installation is made more than one month prior to acceptance or occupancy, perform a final check and adjustment of hardware during the week prior to acceptance or occupancy.

#### **3.04 ADJUSTING**

- A. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation and function.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.
- D. After mechanical systems are balanced, adjust door closers and hardware to comply with allowable speeds and force outlined in ICC A117.1.

- E. Replace units which cannot be meet requirements.

**3.05 CLEANING**

- A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

**3.06 PROTECTION**

- A. Protect finished Work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

**3.07 SCHEDULE - ATTACHED**

**END OF SECTION**

HARDWARE GROUP NO. 01

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON-24VDC	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON-24VDC	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
4	EA	SILENCER	SR64	GRY	IVE
2	EA	WIRE HARNESS	CON-26P (FROM EPT TO ELECTRIFIED HARDWARE- VERIFY LENGTH BEFORE ORDERING)		SCH
2	EA	WIRE HARNESS	CON-6W (FROM EPT OR STRIKE TO POWER)		SCH
1	EA	POWER SUPPLY	PS904 900-4RL-FA 900-BBK 120/240 VAC		VON
1			ACCESS CONTROL - WORK OF DIVISION 28		
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

VERIFY EXISTING FRAME HINGE PREP (SIZE AND WEIGHT) BEFORE ORDERING NEW HINGES.  
 POWER SUPPLY REQUIRES 120VAC AND INPUT FROM LOCKDOWN SYSTEM. (1) POWER  
 SUPPLY TO OPERATE UP TO (4) ELECTRIFIED PANIC DEVICES.

HARDWARE GROUP NO. 02

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON-24VDC	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON-24VDC	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	PNEUMATIC OPERATOR	RE-USE EXISTING		LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
4	EA	SILENCER	SR64	GRY	IVE
2	EA	WIRE HARNESS	CON-26P (FROM EPT TO ELECTRIFIED HARDWARE- VERIFY LENGTH BEFORE ORDERING)		SCH
2	EA	WIRE HARNESS	CON-6W (FROM EPT OR STRIKE TO POWER)		SCH
1	EA	POWER SUPPLY	PS904 900-4RL-FA 900-BBK 120/240 VAC		VON
1			ACCESS CONTROL - WORK OF DIVISION 28		
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

VERIFY EXISTING FRAME HINGE PREP (SIZE AND WEIGHT) BEFORE ORDERING NEW HINGES.  
 RE-USE EXISTING LCN PNEUMATIC DOOR OPERATORS AT BOTH LEAVES (INVESTIGATE AND  
 REPORT ON FUNCTIONALITY/CONDITION.)  
 RE-USE EXISTING WALL ACTUATORS FOR AUTO OPERATORS.  
 EXISTING PNEUMATIC OPERATOR CONTROL BOX MIGHT NEED A RELAY PACKAGE ADDED-  
 PLEASE VERIFY IF THERE ARE EXISTING RELAYS IN THE CONTROL BOX.

HARDWARE GROUP NO. 03

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON-24VDC	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON-24VDC	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 CS WMS	689	LCN
2	EA	NARROW ACTUATOR	8310-818T	630	LCN
2	EA	FLUSH MOUNT BOX	8310-819F	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
4	EA	SILENCER	SR64	GRY	IVE
2	EA	WIRE HARNESS	CON-26P (FROM EPT TO ELECTRIFIED HARDWARE- VERIFY LENGTH BEFORE ORDERING)		SCH
2	EA	WIRE HARNESS	CON-6W (FROM EPT OR STRIKE TO POWER)		SCH
1	EA	POWER SUPPLY	PS904 900-4RL-FA 900-BBK 120/240 VAC		VON
1			ACCESS CONTROL - WORK OF DIVISION 28		
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

AUTO OPERATOR AND POWER SUPPLY REQUIRE 120VAC AND LOCKDOWN INPUT. (1) POWER SUPPLY CAN OPERATE UP TO (4) ELECTRIFIED PANIC DEVICES.

RE-USE EXISTING LCN PNEUMATIC DOOR OPERATORS AT BOTH LEAVES (INVESTIGATE AND REPORT ON FUNCTIONALITY/CONDITION.)

RE-USE EXISTING WALL ACTUATORS FOR AUTO OPERATORS.

EXISTING PNEUMATIC OPERATOR CONTROL BOX MIGHT NEED A RELAY PACKAGE ADDED- PLEASE VERIFY IF THERE ARE EXISTING RELAYS IN THE CONTROL BOX.

HARDWARE GROUP NO. 04

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON-24VDC	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	WIRE HARNESS	CON-26P		SCH
			(FROM EPT TO ELECTRIFIED HARDWARE- VERIFY LENGTH BEFORE ORDERING)		
1	EA	WIRE HARNESS	CON-6W		SCH
			(FROM EPT OR STRIKE TO POWER)		
1	EA	POWER SUPPLY	PS904 900-4RL-FA 900-BBK 120/240 VAC		VON
1			ACCESS CONTROL - WORK OF DIVISION 28		
1	SET	WIRING DIAGRAMS	PROVIDE POINT TO POINT WIRING SCHEMATICS		

POWER SUPPLY REQUIRES 120VAC AND INPUT FROM LOCKDOWN SYSTEM. (1) POWER SUPPLY TO OPERATE UP TO (4) ELECTRIFIED PANIC DEVICES.

**SECTION 08 80 00**  
**GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Glazing units.
- B. Glazing compounds and accessories.

**1.02 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015.
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2015).
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- E. GANA (GM) - GANA Glazing Manual; 2008.
- F. GANA (SM) - GANA Sealant Manual; 2008.
- G. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.
- H. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).

**1.03 SUBMITTALS**

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Product Data on Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit one sample 12 by 12 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.04 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

**1.05 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 40 degrees F.

**1.06 WARRANTY**

- A. See Section 01 70 00 - Execution and Closeout Requirements, for additional warranty requirements
- B. Heat Soaked Tempered Glass: Provide a five (5) year manufacturer warranty to include coverage for spontaneous breakage of fully tempered glass caused by nickel sulfide (NiS) inclusions.



## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Glass Fabricators:
  - 1. Garibaldi Glass: [www.garibaldiglass.com](http://www.garibaldiglass.com).
  - 2. Hartung Glass Industries: [www.hartung-glass.com](http://www.hartung-glass.com).
  - 3. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 4. Viracon, Inc: [www.viracon.com](http://www.viracon.com).
  - 5. Vitrium Industries: [www.vitrium.ca](http://www.vitrium.ca).
  - 6. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- B. Float Glass Manufacturers:
  - 1. AGC Glass Company North America, Inc: [www.us.agc.com](http://www.us.agc.com).
  - 2. Cardinal Glass Industries: [www.cardinalcorp.com](http://www.cardinalcorp.com).
  - 3. Guardian Industries Corp: [www.sunguardglass.com](http://www.sunguardglass.com).
  - 4. Pilkington North America Inc: [www.pilkington.com/na](http://www.pilkington.com/na).
  - 5. Vitro Architectural Glass (formerly PPG): [www.vitroglazings.com](http://www.vitroglazings.com).
  - 6. Substitutions: Refer to Section 01 60 00 - Product Requirements.

### **2.02 GLASS MATERIALS**

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
  - 1. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
  - 2. Fully Tempered Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 criteria.
  - 3. Heat-Soak Testing (HST): Provide HST of fully tempered glass used on canopy, point-supported, spider wall, high-risk, sloping overhead, horizontal overhead, free-standing glass protective barrier, or other demanding applications of project, to reduce risks of spontaneous breakage due to nickel sulfide (NiS) induced fractures in accordance with industry established testing requirements.

### **2.03 GLAZING UNITS**

- A. Type G-2 - Monolithic Safety Glazing: Non-fire-rated.
  - 1. Applications:
    - a. Glazed lites in doors, except fire doors.
  - 2. Glass Type: Fully tempered glass as specified.
  - 3. Tint: Clear.
  - 4. Thickness: 1/4 inch, nominal.
  - 5. Glazing Method: Dry glazing method, gasket glazing.

### **2.04 ACCESSORIES**

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
  - 1. Width: As required for application.
  - 2. Thickness: As required for application.
  - 3. Spacer Rod Diameter: As required for application.
- D. Glazing Clips: Manufacturer's standard type.

## **PART 3 EXECUTION**

### **3.01 VERIFICATION OF CONDITIONS**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

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

### **3.03 INSTALLATION, GENERAL**

### **3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)**

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

### **3.05 CLEANING**

- A. See Division 00 - Procurement and Contracting Requirements and Division 01 - General Requirements for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove non-permanent labels immediately after glazing installation is complete.
- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

### **3.06 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**