

**SECTION 08 71 00  
DOOR HARDWARE**

**PART 1 GENERAL**

**1.1 STIPULATIONS**

- A. The specifications sections "General Conditions to the Construction Contract", "Special Conditions" and "Division 01 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

**1.2 SECTION INCLUDES**

- A. Hardware for hollow metal doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Thresholds.
- E. Weatherstripping and gasketing.

**1.3 RELATED REQUIREMENTS**

- A. Section 07 92 00 - Joint Sealants: Sealants for setting exterior door thresholds.
- B. Section 08 11 13 - Hollow Metal Doors and Frames.

**1.4 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. BHMA (CPD) - Certified Products Directory Current Edition.
- C. BHMA A156.1 - American National Standard for Butts and Hinges 2016.
- D. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches 2017.
- E. BHMA A156.3 - American National Standard for Exit Devices 2014.
- F. BHMA A156.4 - American National Standard for Door Controls - Closers 2013.
- G. BHMA A156.6 - American National Standard for Architectural Door Trim 2015.
- H. BHMA A156.7 - American National Standard for Template Hinge Dimensions 2016.
- I. BHMA A156.12 - American National Standard for Interconnected Locks 2013.
- J. BHMA A156.15 - American National Standard for Release Devices - Closer Holder, Electromagnetic and Electromechanical 2015.
- K. BHMA A156.16 - American National Standard for Auxiliary Hardware 2018.
- L. BHMA A156.18 - American National Standard for Materials and Finishes 2016.

- M. BHMA A156.21 - American National Standard for Thresholds 2014.
- N. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems Sponsor 2017.
- O. BHMA A156.23 - American National Standard for Electromagnetic Locks 2017.
- P. BHMA A156.26 - American National Standard for Continuous Hinges 2017.
- Q. BHMA A156.28 - American National Standard for Recommended Practices for Mechanical Keying Systems 2018.
- R. BHMA A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators 2013.
- S. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.
- T. DHI (KSN) - Keying Systems and Nomenclature 1989.
- U. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- V. ITS (DIR) - Directory of Listed Products Current Edition.
- W. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- X. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- Y. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
- Z. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
- AA. UL (DIR) - Online Certifications Directory Current Edition.
- BB. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Keying Requirements Meeting:
  - 1. Schedule meeting at project site prior to Contractor occupancy.
  - 2. Attendance Required:
    - a. Contractor.
    - b. Client Agency.
    - c. Architect.

3. Agenda:
  - a. Establish keying requirements.
  - b. Verify locksets and locking hardware are functionally correct for project requirements.
  - c. Verify that keying and programming complies with project requirements.
  - d. Establish keying submittal schedule and update requirements.
4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
  - a. Key control system requirements.
5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Client Agency, participants, and those affected by decisions made.
6. Deliver established keying requirements to manufacturers.

## **1.6 SUBMITTALS**

- A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- B. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
  1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
  2. List groups and suffixes in proper sequence.
  3. Provide complete description for each door listed.
  4. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
  5. Include account of abbreviations and symbols used in schedule.
- C. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
  1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
  2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.

3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- F. Keying Schedule:
  1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- G. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Client Agency's name and registered with manufacturer.

## **1.7 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

## **1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

## **1.9 PRE-INSTALLATION MEETING**

- A. Contractor shall utilize the Pre-Installation Meeting Agenda and Pre-Installation Meeting Checklist documents located in e-Builder, Z - Standard Documentation & Training project: Documents \ 03 - Construction - Training and Guidance Documents \ 03 - Role Based Training and Guidance Documents \ Contractors.

## **1.10 WARRANTY**

- A. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
  1. Closers: Five years, minimum.
  2. Exit Devices: Three years, minimum.
  3. Locksets and Cylinders: Three years, minimum.
  4. Other Hardware: Two years, minimum.

## **PART 2 PRODUCTS**

### **2.1 DESIGN AND PERFORMANCE CRITERIA**

- A. **All door hardware shall be ligature-resistant, unless noted otherwise.**
- B. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

- C. Provide individual items of single type, of same model, and by same manufacturer.
- D. Provide door hardware products that comply with the following requirements:
  - 1. Applicable provisions of federal, state, and local codes.
  - 2. Accessibility: ADA Standards and ICC A117.1.
  - 3. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
  - 4. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
  - 5. Listed and certified compliant with specified standards by BHMA (CPD).
  - 6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
  - 7. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.
- E. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.
- F. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series.
- G. Fasteners:
  - 1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
    - a. Aluminum fasteners are not permitted.
    - b. Provide tamper-proof screws with heads finished to match door surface hardware unless otherwise indicated.
  - 2. Fire-Rated Applications: Comply with NFPA 80.
    - a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
    - b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

## **2.2 HINGES**

- A. Hinges: Comply with BHMA A156.1, Grade 1.
  - 1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges. Sloped top for ligature-resistance.
    - a. Provide hinge width required to clear surrounding trim.

2. Continuous Hinges: Comply with BHMA A156.26. Sloped top for ligature-resistance.
3. Provide hinges on every swinging door.
4. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
5. Provide ball-bearing hinges at each door with closer.
6. Provide non-removable pins on exterior outswinging doors.
7. Provide power transfer hinges where electrified hardware is mounted in door leaf.
8. Provide following quantity of butt hinges for each door:
  - a. Doors up to 60 inches High: Two hinges.
  - b. Doors From 60 inches High up to 90 inches High: Three hinges.

## **2.3 EXIT DEVICES**

- A. Exit Devices: Comply with BHMA A156.3, Grade 1.
  1. Ligature-resistant lever design to match lockset trim.
  2. Provide cylinder with cylinder dogging or locking trim.
  3. Provide exit devices properly sized for door width and height.
  4. Provide strike as recommended by manufacturer for application indicated.
  5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.
  6. For electrical options, provide quick connect plug-in pre-wired connectors.

## **2.4 ELECTRIC STRIKES**

- A. Electric Strikes: Comply with BHMA A156.31, Grade 1.
  1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
  2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.
  3. Connect electric strikes into fire alarm where non-rated doors are scheduled to release with fire or sprinkler alarm condition.

## **2.5 ELECTROMAGNETIC LOCKS**

- A. Manufacturers:
  1. Securitron; an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  2. Substitutions: None permitted. This is a proprietary product.
- B. Electromagnetic Locks: Comply with BHMA A156.23, Grade 1.

1. Holding Force: 600 lbs, minimum.
2. Voltage: 12 VDC, and provide power supplies by same manufacturer as locks.
3. Provide electromagnetic locks for fire-rated doors in compliance with UL 10C.
4. Mounting: Surface mounted to door and frame with fasteners, brackets, and spacer bars as required for application.

## **2.6 LOCK CYLINDERS**

### **A. Manufacturers:**

1. Best, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
2. Substitutions: None permitted. This is a proprietary product.

### **B. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.**

1. Provide cylinders from same manufacturer as locking device.
2. Provide cams and/or tailpieces as required for locking devices.

## **2.7 CYLINDRICAL LOCKS**

### **A. Manufacturers:**

1. Best, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
2. Substitutions: None permitted. This is a proprietary product.

### **B. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.**

1. Bored Hole: 2-1/8 inch diameter.
2. Latchbolt Throw: 1/2 inch, minimum.
3. Backset: 2-3/4 inch unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
  - a. Finish: To match lock or latch.

## **2.8 INTERCONNECTED LOCKS**

### **A. Interconnected Locks: Comply with BHMA A156.12, Grade 1, 5000 Series.**

## **2.9 DOOR PULLS AND PUSH PLATES**

### **A. Door Pulls and Push Plates: Comply with BHMA A156.6.**

1. Ligature-resistant.
2. Pull Type: Straight, unless otherwise indicated.
3. Push Plate Type: Flat, with square corners, unless otherwise indicated.

- a. Edges: Beveled, unless otherwise indicated.
- 4. Material: Aluminum, unless otherwise indicated.

## **2.10 CLOSERS**

- A. Closers: Comply with BHMA A156.4, Grade 1.
  - 1. Type: Surface mounted to door.
  - 2. Provide door closer on each exterior door.
  - 3. Provide door closer on each fire-rated and smoke-rated door.
  - 4. At outswinging exterior doors, mount closer on interior side of door.
  - 5. At Padded Room #217 and all Resident Bedroom doors, mount closer on corridor side of door.

## **2.11 KICK PLATES**

- A. Kick Plates: Provide along bottom edge of door as indicated on the Door Schedule.
  - 1. Size: 8 inch high by 2 inch less door width (LDW) on push side of door.

## **2.12 ELECTROMAGNETIC DOOR HOLDERS**

- A. Electromagnetic Door Holders: Comply with BHMA A156.15.
  - 1. Type: Wall mounted, single unit, heavy duty, with strike plate attached to door.
  - 2. Holding Force, Heavy Duty: 300 lbs-force, minimum.
  - 3. Voltage: 12 VDC, and provide power supplies by same manufacturer as holders.
  - 4. Provide interface with fire detectors and fire-alarm system for fire-rated door assemblies.

## **2.13 WALL STOPS**

- A. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
  - 1. Provide wall stops to prevent damage to wall surface upon opening door.
  - 2. Type: Bumper, concave, wall stop, ligature-resistant.
  - 3. Material: Aluminum housing with rubber insert.

## **2.14 THRESHOLDS**

- A. Thresholds: Comply with BHMA A156.21.
  - 1. Provide threshold at each exterior door, unless otherwise indicated.
  - 2. Type: Flat surface.
  - 3. Material: Aluminum.



4. Threshold Surface: Fluted horizontal grooves across full width.
5. Field cut threshold to profile of frame and width of door sill for tight fit.
6. Provide non-corroding fasteners at exterior locations.

## **2.15 WEATHERSTRIPPING AND GASKETING**

### **A. Weatherstripping and Gasketing: Comply with BHMA A156.22.**

1. Head and Jamb Type: Adjustable.
2. Door Sweep Type: Encased in retainer.
3. Material: Aluminum, with brush weatherstripping.
4. Provide gasketing for smoke and draft control doors that complies with local codes, requirements of assemblies tested in accordance with UL 1784.
5. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated; .
6. Provide door bottom sweep on each exterior door, unless otherwise indicated.
7. Provide sound-rated gasketing and automatic door bottom on doors indicated as "Sound-Rated", "Acoustical", or with "Sound Transmission Class (STC) rating"; fabricate as continuous gasketing, do not cut or notch gasketing material.

## **2.16 SILENCERS**

### **A. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.**

1. Single Door: Provide three on strike jamb of frame.
2. Pair of Doors: Provide two on head of frame, one for each door at latch side.
3. Material: Rubber, color to be selected by Architect.

## **2.17 KEY CONTROL SYSTEMS**

### **A. Key Control Systems: Comply with guidelines of BHMA A156.28.**

1. Provide keying information in compliance with DHI (KSN) standards.
2. Keying: Grand master keyed.
3. Supply keys in following quantities:
  - a. 1 each Grand Master keys.
4. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."

## **2.18 KEY SWITCH**

### **A. Manufacturers:**

1. Securitron; an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
2. Substitutions: None permitted. This is a proprietary product.

### **B. Key Switch: Tubular key type, single gang, with bi-color LED.**

1. Power: 12 VDC.
2. Operating Temperature: 32 to 110 degrees F.

## **2.19 FINISHES**

### **A. Finishes: Provide door hardware of same finish, unless otherwise indicated.**

1. Primary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
2. Exceptions:
  - a. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
  - b. Hinges for Fire-Rated Doors: Steel base material with painted finish, in compliance with NFPA 80.
  - c. Door Closer Covers and Arms: Color as selected by Architect from manufacturer's standard colors unless otherwise indicated.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of correct characteristics.

### **3.2 INSTALLATION**

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- C. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- D. Use templates provided by hardware item manufacturer.
- E. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.

1. For Steel Doors and Frames: Refer to Section 08 11 13.
  2. Mounting heights in compliance with ADA Standards:
    - a. Locksets: 40-5/16 inch.
    - b. Push Plates/Pull Bars: 42 inch.
    - c. Exit Devices: 40-5/16 inch.
- F. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

### **3.3 ADJUSTING**

- A. Adjust hardware for smooth operation.
- B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

### **3.4 CLEANING**

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

### **3.5 PROTECTION**

- A. Do not permit adjacent work to damage hardware or finish.

**END OF SECTION**