

## SECTION 087100 - DOOR HARDWARE

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section includes:

1. Mechanical door hardware for the following:
  - a. Swinging doors.
2. Cylinders for door hardware specified in other Sections.

## B. Products furnished, but not installed, under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1. Pivots thresholds weather stripping and lock cylinders to be installed under other Sections.
2. Permanent lock cores to be installed by Owner.

## 1.2 SUBMITTALS

## A. Product Data: For each type of product indicated.

## B. Samples: For each exposed product and for each color and texture specified.

## C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - a. Format: Use same scheduling sequence and format as in the Contract Documents.
  - b. Content: Include the following information:
    - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
    - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks.

### 1.3 QUALITY ASSURANCE

- A. **Installer Qualifications:** Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
- B. **Architectural Hardware Consultant Qualifications:** A person 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 and who is currently certified by DHI as follows:
1. For door hardware, an Architectural Hardware Consultant (AHC).
  2. **Air Leakage Rate:** Maximum air leakage of **0.3 cfm/sq. ft. (3 cu. m per minute/sq. m)** at the tested pressure differential of **0.3-inch wg (75 Pa)** of water.
- C. **Means of Egress Doors:** Latches do not require more than **15 lbf (67 N)** to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- D. **Accessibility Requirements:** For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines ICC/ANSI A117.1.
1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than **5 lbf (22.2 N)**.
  2. Comply with the following maximum opening-force requirements:
    - a. **Interior, Non-Fire-Rated Hinged Doors:** **5 lbf (22.2 N)** applied perpendicular to door.
    - b. **Fire Doors:** Minimum opening force allowable by authorities having jurisdiction.
  3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than **1/2 inch (13 mm)** high.
  4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point **3 inches (75 mm)** from the latch, measured to the leading edge of the door.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

### 1.5 WARRANTY

- A. **Special Warranty:** Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
1. **Warranty Period:** Three years from date of Substantial Completion, unless otherwise indicated.
    - a. **Exit Devices:** Two years from date of Substantial Completion.

- b. Manual Closers: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products products complying with BHMA designations referenced.
  - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
  - 1. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

### 2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal and FRP doors and hollow-metal and FRP frames.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Baldwin Hardware Corporation.
    - b. Bommer Industries, Inc.
    - c. Cal-Royal Products, Inc.
    - d. Hager Companies.
    - e. IVES Hardware; an Ingersoll-Rand company.
    - f. Lawrence Hardware Inc.
    - g. McKinney Products Company; an ASSA ABLOY Group company.
    - h. PBB, Inc.
    - i. Stanley Commercial Hardware; Div. of The Stanley Works.

### 2.3 MECHANICAL LOCKS AND LATCHES

- A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

2. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.

## 2.4 EXIT DEVICES AND AUXILIARY ITEMS

### A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Adams Rite Manufacturing Co.; an ASSA ABLOY Group company.
  - b. Arrow USA; an ASSA ABLOY Group company.
  - c. Cal-Royal Products, Inc.
  - d. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
  - e. Detex Corporation.
  - f. Door Controls International, Inc.
  - g. DORMA Architectural Hardware; Member of The DORMA Group North America.
  - h. Dor-O-Matic; an Ingersoll-Rand company.
  - i. K2 Commercial Hardware; a Black & Decker Corp. company.
  - j. Monarch Exit Devices & Panic Hardware; an Ingersoll-Rand company.
  - k. Precision Hardware, Inc.; Division of Stanley Security Solutions, Inc.
  - l. Rutherford Controls Int'l. Corp.
  - m. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
  - n. Von Duprin; an Ingersoll-Rand company.
  - o. Yale Security Inc.; an ASSA ABLOY Group company.

## 2.5 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  1. Manufacturer: Same manufacturer as for locking devices.
- B. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

## 2.6 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  1. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders.
  2. Existing System:
    - a. Master key or grand master key locks to Owner's existing system.
  3. Keyed Alike: Key all cylinders to same change key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
  - a. Notation: "DO NOT DUPLICATE."
2. Quantity: In addition to one extra key blank for each lock, provide the following:
  - a. Grand Master Keys: Five.

## 2.7 OPERATING TRIM

A. Operating Trim: BHMA A156.6; aluminum, unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Burns Manufacturing Incorporated.
  - b. Don-Jo Mfg., Inc.
  - c. Forms + Surfaces.
  - d. Hager Companies.
  - e. Hiawatha, Inc.
  - f. IVES Hardware; an Ingersoll-Rand company.
  - g. Rockwood Manufacturing Company.
  - h. Trimco.

## 2.8 ACCESSORIES FOR PAIRS OF DOORS

A. Astragals: BHMA A156.22.

## 2.9 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Arrow USA; an ASSA ABLOY Group company.
  - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
  - c. DORMA Architectural Hardware; Member of The DORMA Group North America.
  - d. Dor-O-Matic; an Ingersoll-Rand company.
  - e. K2 Commercial Hardware; a Black & Decker Corp. company.
  - f. LCN Closers; an Ingersoll-Rand company.
  - g. Norton Door Controls; an ASSA ABLOY Group company.

- h. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
- i. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
- j. Yale Security Inc.; an ASSA ABLOY Group company.

## 2.10 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Architectural Builders Hardware Mfg., Inc.
    - b. Baldwin Hardware Corporation.
    - c. Burns Manufacturing Incorporated.
    - d. Cal-Royal Products, Inc.
    - e. Don-Jo Mfg., Inc.
    - f. Door Controls International, Inc.
    - g. Hager Companies.
    - h. Hiawatha, Inc.
    - i. IVES Hardware; an Ingersoll-Rand company.
    - j. Rockwood Manufacturing Company.
    - k. Stanley Commercial Hardware; Div. of The Stanley Works.
    - l. Trimco.

## 2.11 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; air leakage not to exceed **0.50 cfm per foot** (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.
    - b. M-D Building Products, Inc.
    - c. National Guard Products.
    - d. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - e. Reese Enterprises, Inc.
    - f. Sealeze; a unit of Jason Incorporated.
    - g. Zero International.

## 2.12 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hager Companies.
  - b. M-D Building Products, Inc.
  - c. National Guard Products.
  - d. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
  - e. Reese Enterprises, Inc.
  - f. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
  - g. Sealeze; a unit of Jason Incorporated.
  - h. Zero International.

## 2.13 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
  1. Fire-Rated Applications:
    - a. Steel Through Bolts: For the following unless door blocking is provided:
      - 1) Surface hinges to doors.
      - 2) Closers to doors and frames.
      - 3) Surface-mounted exit devices.
  2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
  3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## 2.14 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Steel and FRP Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  2. Custom Steel Doors and Frames: HMMA 831.
- C. 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 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- D. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every **30 inches (750 mm)** of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- E. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Replace construction cores with permanent cores as directed by Owner.
- F. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- G. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- I. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- K. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

### 3.2 DOOR HARDWARE SCHEDULE

PRIVATE tbl1

Door Hardware Set No. 1

Locations: Aluminum Entrance- Exterior Pair; each to have the following:

2 Closers (each door leaf)

2 Panic Hardware (Each door leaf)

1 Threshold per pair doors

Opener (new) on Accessible door leaf to be wired back to Handicap Access Controls Contractor to reinstall existing Handicap Access Controls to new door



## PRIVATE tbl1

## Door Hardware Set No. 2

Locations: Aluminum Entrance- Interior Pair; each to have the following:

2 Closers (each door leaf)

2 Panic Hardware (Each door leaf)

1 Threshold per pair doors

Opener (new) on Accessible door leaf to be wired back to Handicap Access Controls

Contractor to reinstall existing Handicap Access Controls to new door

2 Door Stop floor mounted half dome

## PRIVATE tbl1

## Door Hardware Set No. 3

Locations: FRP Entrance- Exterior to have the following:

Closers

Panic Hardware

1 Threshold

Opener on Accessible door leaf to be wired back to Handicap Access Controls

Contractor to reinstall existing Handicap Access Controls to new door

Door Stop (style as necessary to keep door from hitting building)

## PRIVATE tbl1

## Door Hardware Set No. 4

Locations: FRP Entrance- Interior to have the following:

Closers

Panic Hardware

1 Threshold

Opener on Accessible door leaf to be wired back to Handicap Access Controls

Contractor to reinstall existing Handicap Access Controls to new door

Door Stop Half Dome Floor Mounted

## PRIVATE tbl1

## Door Hardware Set No. 5

Locations: Hollow Metal – Building 2 Entrance- Exterior to have the following:

Closers

Panic Hardware

1 Threshold

Opener on Accessible door leaf to be wired back to Handicap Access Controls

Contractor to reinstall existing Handicap Access Controls to new door

Door Stop (style as necessary to keep door from hitting building)

END OF SECTION 087100