

## SECTION 08 71 00

### DOOR HARDWARE

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

- B. This Section includes the following:

1. Hinges.
2. Pivots.
4. Lock cylinders and keys.
5. Lock and latch sets.
6. Bolts.
7. Exit devices.
8. Push/pull units.
9. Closers.
10. Overhead holders.
11. Miscellaneous door control devices.
12. Door trim units.
13. Protection plates.
15. Weatherstripping for exterior doors.
16. Sound stripping for interior doors.
17. Astragals or meeting seals on pairs of doors.
18. Thresholds.

- C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 8 Section "Hollow Metal Doors and Frames" for silencers integral with hollow metal frames.
2. Division 8 Section "Flush Wood Doors" for factory prefabricating and factory pre-machining of doors for door hardware.
3. Division 8 Section "Aluminum Entrances and Storefronts".

##### 1.3 HARDWARE ALLOWANCE

- A. Selection and Ordering: Furnish door hardware as selected by Architect and other

general provisions of the Contract. Owner will provide and install electronic security entrance system devices at guest entry doors and exterior doors accessible to the public.

B. Door hardware supplier's responsibilities shall be as follows:

1. Submittals: Submit through Contractor required product data, final hardware schedule, separate keying schedule, and samples as specified in this Section, unless otherwise indicated.
2. Construction Schedule: Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule.
3. Coordination and Templates: Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.
4. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.
5. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner's maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

C. Contractor's responsibilities shall be as follows:

1. Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.
2. Construction Schedule: Cooperate with door hardware supplier in establishing scheduled dates for submittals and delivery of templates and door hardware. Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.
3. Coordination: Coordinate door hardware with other Work. Furnish hardware supplier or manufacturer, including Owner retained electronic security device supplier, with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.
4. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.
5. Installation Information: The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.

#### 1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division

1 Specification sections.

- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    - a. Type, style, function, size, and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
    - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for hardware.
    - g. Door and frame sizes and materials.
    - h. Keying information.
  - 2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
  - 4. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
  - 1. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.
- C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to

authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

#### 1.6 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

#### 1.7 MAINTENANCE

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

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following
  - 1. Butts and Hinges:
    - a. Hager Hinge Co.
    - b. McKinney Products Co., (ASSA Abloy).
    - c. Best, (dormakaba).
    - d. Ives, (Allegion).
  - 2. Pivots:
    - a. Glynn-Johnson Corp., (Allegion).
    - b. Hager Hinge Co.
    - c. LCN, (Allegion).

- d. Rixson-Firemark, (ASSA Abloy)
  - e. Dorma, (dormakaba).
3. Key Control System:
- a. Key Control Systems, Inc.
  - b. Telkee Inc.
4. Cylinders and Locks:
- a. Best Lock Corp., (dormakaba).
  - b. Corbin & Russwin Architectural Hardware (ASSA Abloy).
  - c. Sargent Manufacturing Company, (ASSA Abloy).
  - d. Schlage Lock, (Allegion).
5. Bolts:
- a. Burns Manufacturing
  - b. Glynn-Johnson Corp., (Allegion).
  - c. Hager Hinge Co.
  - d. Ives, (Allegion).
  - e. Rockwood Manufacturing, (ASSA Abloy).
  - f. Trimco Hardware.
6. Exit/Panic Devices:
- a. Precision Hardware, Inc., (dormakaba).
  - b. Sargent Manufacturing Company, (ASSA Abloy).
  - c. Von Duprin, (Allegion).
  - d. Detex Manufacturing.
7. Push/Pull Units:
- a. Burns Manufacturing.
  - b. Rockwood Manufacturing, (ASSA Abloy).
  - c. Ives, (Allegion).
  - d. Trimco Hardware.
8. Overhead Closers:
- a. Best, (dormakaba).
  - b. Dorma Door Controls, (dormakaba).
  - c. LCN, (Allegion).
  - d. Norton Door Controls, (ASSA Abloy).
  - e. Sargent Manufacturing Company, (ASSA Abloy).
11. Door Control Devices:
- a. Burns Manufacturing
  - b. Trimco Hardware

- c. Glynn-Johnson Corp., (Allegion).
  - d. Hager Hinge Co.
  - e. Ives, (Allegion).
  - f. Rockwood Manufacturing.
12. Kick, Mop, and Armor Plates:
- a. Trimco Hardware.
  - b. Burns Manufacturing.
  - c. Hager Hinge Co.
  - d. Hiawatha, Inc.
  - e. Ives.
14. Door Stripping and Seals:
- a. National Guard Products, Inc.
  - b. Pemko Manufacturing Co., Inc.
  - c. Reese Enterprises, Inc.
  - d. Sealeze Corp.
  - e. Zero International, Inc.
15. Thresholds:
- a. b. National Guard Products, Inc.
  - b. Pemko Manufacturing Co., Inc.
  - c. Reese Enterprises, Inc.
  - d. Sealeze Corp.
  - e. Zero International, Inc.
16. Sound Stripping:
- a. National Guard Products, Inc.
  - b. Pemko Manufacturing Co., Inc.
  - c. Reese Enterprises, Inc.
  - d. Zero International, Inc.
17. Astragals:
- a. National Guard Products, Inc.
  - b. Pemko Manufacturing Co., Inc.
  - c. Reese Enterprises, Inc.
  - d. Zero International, Inc.

## 2.2 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.

1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- C. Base Metals: Produce hardware units of basic metal and forming method indicated using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units for finish designations indicated.
- D. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- E. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
- F. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

### 2.3 HINGES, BUTTS, AND PIVOTS

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Provide Phillips flat-head screws complying with the following requirements:
  1. For metal doors and frames install machine screws into drilled and tapped holes.
  2. For wood doors and frames install wood screws.
  3. For fire-rated wood doors install #12 x 1-1/4-inch (32-mm), threaded-to-the-head steel wood screws.
  4. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  1. Out-Swing Exterior Doors: Nonremovable pins.
  2. Out-Swing Corridor Doors with Locks: Nonremovable pins.
  3. Interior Doors: Non rising pins.

4. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.
- D. Number of Hinges: Provide not less than 3 hinges per door leaf for doors 90 inches (2250 mm) or less in height and one additional hinge for each 30 inches (750 mm) of additional height.
1. Fire-Rated Doors: Not less than 3 hinges per door leaf for doors 86 inches (2150 mm) or less in height with same rule for additional hinges.

## 2.4 LOCK CYLINDERS AND KEYING

- A. Existing System: Grandmasterkey the locks to the Owner's existing system, with a new masterkey for the Project. The Owner's existing system is "Best" "Cormax". Locks, Best Model 9K3. Final cores to be furnished by owner.
- B. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either integrated with Owner's existing system.
- C. Prepare all locksets and cylinders to receive 7-pin interchangeable Cormax tumbler cylinder with construction masterkey feature that permits voiding of construction keys without cylinder removal, or equip locks with cylinders for interchangeable-core pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove these when directed.
1. Final cores and keys to be furnished by and installation by Owner.
- D. Metals: Construct lock cylinder parts from stainless steel.
- E. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
1. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE."
- F. Key Material: Provide keys of nickel silver only.
- G. Key Quantity: Furnish 3 change keys for each lock, 5 master keys for each master system, and 5 grandmaster keys for each grandmaster system.
1. Furnish one extra blank for each lock.
  2. Deliver keys to Owner.

## 2.5 LOCKS, LATCHES, AND BOLTS

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

1. Provide flat lip strikes for locks with 3-piece, antifriction latch bolts as recommended by manufacturer.
  2. Provide extra long strike lips for locks used on frames with applied wood casing trim.
  3. Provide recess type top strikes for bolts locking into head frames, unless otherwise indicated.
  4. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non recessed strike for bolt.
  5. Provide roller type strikes where recommended by manufacturer of the latch and lock units.
- B. Lock Throw: Provide 5/8-inch (16-mm) minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
1. Provide 1/2-inch (13-mm) minimum throw of latch for other bored, 3/4-inch (19-mm) minimum throw of latch for mortise locks. Provide 1-inch (25-mm) minimum throw for all dead bolts.
- C. Flush Bolt Heads: Minimum of 1/2-inch- (13-mm-) diameter rods of brass, bronze, or stainless steel with minimum 12-inch- (300-mm-) long rod for doors up to 84 inches (2100 mm) in height. Provide longer rods as necessary for doors exceeding 84 inches (2100 mm) in height.
- D. Exit Device Dogging: Except on fire-rated doors where closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to keep the latch bolt retracted, when engaged.

## 2.6 PUSH/PULL UNITS

- A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation, thru-bolted for matched pairs but not for single units.
- B. Concealed Fasteners: Provide manufacturer's special concealed fastener system for installation, thru-bolted for matched pairs but not for single units.

## 2.7 CLOSERS AND DOOR CONTROL DEVICES

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending on size of door, exposure to weather, and anticipated frequency of use.
1. Provide parallel arms for all overhead closers, except as otherwise indicated.
- B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.

## 2.8 DOOR TRIM UNITS

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units

consisting of either machine screws or self-tapping screws.

- B. Fabricate protection plates not more than 1-1/2 inches (38 mm) less than door width on hinge side and not more than 1/2 inch (13 mm) less than door width on pull side by height indicated.

- 1. Metal Plates: Stainless steel, 0.050 inch (U.S. 18 gage) (1.3 mm).

## 2.9 HARDWARE FOR INTERIOR SLIDING DOORS

- A. General: Provide manufacturer's standard hardware for interior sliding doors when not furnished as part of complete door package.
- B. Operating Hardware for Pocket Doors: Provide manufacturer's complete set consisting of extruded aluminum or galvanized steel overhead track, adjustable hangers (carriages), galvanized steel split-jambs and split-studs, wood nailers for head track, jambs and studs, galvanized steel brackets for assembly and attachment to floor and wall framing, bumpers, and nylon floor guides designed to accommodate the number (single and biparting), size, thickness, and weight of door leaves indicated. Provide flush pull and edge pull for each door leaf.

## 2.10 WEATHERSTRIPPING AND SEALS

- A. General: Provide continuous weatherstripping on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
- B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.
- C. Weatherstripping at Jambs and Heads: Provide bumper-type resilient insert and metal retainer strips, surface applied unless shown as mortised or semimortised, and of following metal, finish, and resilient bumper material:
  - 1. Extruded aluminum with natural anodized finish, 0.062-inch (1.6-mm) minimum thickness of main walls and flanges.
  - 2. Solid neoprene conforming to MIL R 6855, Class II, Grade 40.
    - a. Flexible, hollow bulb or loop insert.
- D. Weatherstripping at Door Bottoms: Provide threshold consisting of contact-type resilient insert and metal housing of design and size shown and of following metal, finish, and resilient seal strip:
  - 1. Extruded aluminum with natural anodized finish, 0.062-inch (1.6-mm) minimum thickness of main walls and flanges.
  - 2. Flexible vinyl wiper or sweep seal strip.

## 2.11 THRESHOLDS

- A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.
- B. Exterior Hinged or Pivoted Doors: Provide units not less than 4 inches (100 mm) wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames, and as follows:
  - 1. For in-swinging doors provide units with interlocking lip and interior drain channel; include hook on bottom edge of door and drain pan.
  - 2. For out-swinging doors provide units with interlocking lip and with hook on bottom edge of door to act as weather bar.
  - 3. For out-swinging doors provide rabbeted type units with replaceable weatherstrip insert in stop.

## 2.12 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match those established by BHMA or, if none established, match the Architect's sample.
- C. 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.
- D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
  - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
  - 2. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute.
  - 3. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes

have been completed on the substrates involved.

- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers."
- F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

### 3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
  - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

### 3.3 HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. Manufacturer's Abbreviations:
  - 1. BEs - Best Locking Systems
  - 2. DOR - Dorma
  - 3. NGP - National Guard Products
  - 4. PRE - Precision Hardware
  - 5. RCI - Rutherford Controls

HARDWARE SET: 01				
DOORS #:				
6	HINGES	FBB168 4.5 x 4.5 NRP	US26D	BES
1	VERTICAL ROD PANIC DEVICE	2208 x 4908D LBR	630	PRE
1	CYLINDER & CORE	RIM TYPE	626	BES
1	VERTICAL ROD PANIC DEVICE	2201 x 4902D LBR	630	PRE
2	DOOR CLOSERS	8916 FC DS BSHD	689	DOR
2	KICK PLATES	K0050 10" x 2" LDW .050 B4E CSK	630	TRE
1	GASKETING	2525 (HEAD & JAMBS)	CHA	NGP

HARDWARE SET: 02				
DOOR#:				
QTY	DESCRIPTION	PRODUCT	FIN.	MAN.
3	HINGES	FBB179 4.5 x 4.5	US26D	BES
1	PRIVACY SET	45H0L14D VIB	626	BRS
1	KICK PLATE	K0050 10" x 2" LDW .050 B4E CSK	630	TRM
1	MOP PLATE	KM050 4" x 1" LDW .050 B4E CSK	630	TRM
1	WALL BUMPER	1270CXSV	626	TRM
3	DOOR SILENCERS	1229A	GRY	TRM

END OF SECTION

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