

**SECTION 08 71 00  
DOOR HARDWARE**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Door hardware and related items necessary for complete installation and operation of swing doors.

**1.2 RELATED WORK**

- A. Application of Hardware: Section 08 14 00, INTERIOR WOOD DOORS, Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.
- B. The Hardware Group Schedule is shown on Drawing sheet AS-890.

**1.3 GENERAL**

- A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.
- B. Hardware for Labeled Fire Doors and Exit Doors: Conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Provide hardware listed by UL, except where heavier materials, large size, or better grades are specified herein under paragraph HARDWARE SETS. In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements
  - 1. The word "FIRE" must be included as part of the certification on the Underwriters Laboratories label on exit devices to be used on fire doors.
- C. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.
- D. The following items shall be of the same manufacturer, if possible, except as otherwise specified:
  - 1. Mortise locksets.
  - 2. Hinges for hollow metal and wood doors.
  - 3. Surface applied overhead door closers.
  - 4. Exit devices.

**1.4 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

C. Samples and Manufacturers' Literature:

1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.

D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

### 1.5 QUALITY ASSURANCE

A. Pre-Installation Meeting: Prior to the start of construction, the general contractor shall schedule and conduct a pre-installation meeting with the hardware supplier and the manufacturer representative who supplied the commercial locks, the exit devices and the door controls/closers. The purpose is to coordinate materials and techniques, and sequence complex hardware items and systems installation. Proper and correct installation and adjustment of hardware is to be reviewed, and criteria for punch list review will be established. Convene at least one week prior to commencement of hardware installation; notify the COR of date and time. Written documentation of date, attendees and participants is to be provided to the COR.

- B. Post-Installation Meeting: Prior to VA occupancy, the general contractor shall schedule and conduct a post-installation meeting with the hardware supplier and the manufacturer representative who supplied the commercial locks, the exit devices, the door controls/closers, etc. for review of the installation of devices.

#### 1.6 DELIVERY AND MARKING

- A. Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to the COR for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in the COR's office until all other similar items have been installed in project, at which time the COR will deliver items on file to Contractor for installation in predetermined locations on the project.

#### 1.7 INSTRUCTIONS

- A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, muters, thresholds and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters "HG" followed by a number. Each number designates a set of hardware items applicable to a door type.
- B. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used, except for Best locks, which is a building standard item. Manufacturers identified herein by abbreviations as follows:

Adams-Rite	Adams Rite Mfg. Co.	Glendale, CA
Norton	Norton Door Controls	Monroe, NC
LCN	LCN Closers, Inc.	Princeton, IL
Best	Best Mfg., Co.	Indianapolis, In
Hager	Hager Hinge Company	Ontario, Ca.Saint
Stanley	The Stanley Works	New Britain, CT
Trimco	Triangle Brass Mfg. Co.	Los Angeles, CA
Sargent	Sargent Manufacturing Co.	New Haven, CT
Von Duprin	Von Duprin Hardware Co.	Indianapolis, IN
NGP	National Guard Products	Memphis, Tn.

Rockwood	Rockwood Mfg Co.	Reamstown, Pa.
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### 1.8 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.
- B. American Society for Testing and Materials (ASTM):  
F883-04.....Padlocks
- C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):  
A156.1-00.....Butts and Hinges  
A156.3-01.....Exit Devices  
A156.4-00.....Door Controls (Closers)  
A156.5-01.....Auxiliary Locks and Associated Products  
A156.6-05.....Architectural Door Trim  
A156.8-05.....Door Controls-Overhead Stops and Holders  
A156.13-05.....Mortise Locks and Latches Series 1000  
A156.15-06.....Release Devices-Closer Holder, Electromagnetic  
and Electromechanical  
A156.16-02.....American National Standard for Auxiliary  
Hardware  
A156.18-00.....Materials and Finishes  
A156.21-06.....Thresholds  
A156.22-05.....Door Gasketing and Edge Seal Systems  
A156.26-00.....Continuous Hinges  
A156.31 .....American National Standard for Electric Strikes  
and Frame Mounted Actuators  
A250.8-03.....Standard Steel Doors and Frames
- D. National Fire Protection Association (NFPA):  
80-06.....Fire Doors and Fire Windows  
101-05.....Life Safety Code
- E. Underwriters Laboratories, Inc. (UL):  
Building Materials Directory (2007)

**PART 2 - PRODUCTS****2.1 BUTT HINGES**

A. ANSI A156.1. Provide ball bearing butts. The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:

1. Interior Doors: Type A8112 for doors 900 mm (3 feet) wide or less and Type A8111 for doors over 900 mm (3 feet) wide.
2. Automatic doors hung on butts: Type A8111.
3. 45 minute and above Labeled Wood Fire Doors: Type A8411 or Type A8412; these hinges shall be thru bolted to door with hex nuts and bolts.

**2.2 CONTINUOUS HINGES**

A. ANSI/BHMA A156.26, Grade 1-600.

1. Listed under Category N in BHMA's "Certified Product Directory."

B. General: Minimum 0.120 inch (3.0 mm) thick, hinge leaves with minimum overall width of 4 inches (102 mm); fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete:

1. Fire Pins: Steel pins to hold labeled fire doors in place if required by tested listing.

C. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves; joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.

1. Available manufacturers include, and limited to, the following:
  - a. Ives
  - b. McKinney
  - c. Pemko

**2.3 DOOR CLOSING DEVICES**

A. Closing devices shall be products of LCN Closers, Inc., Norton Door Controls

**2.4 OVERHEAD CLOSERS**

A. Conform to ANSI A156.4, Grade 1; LCN 4040 series, Norton 7500 series.

B. Closers shall conform to the following:

1. The closer shall have 50 percent adjustable closing force over minimum value for that closer and have adjustable hydraulic back check effective between 60 degrees and 85 degrees of door opening.
2. Where specified, closer shall have hold-open feature.

3. Size Requirements: Size closers in accordance with manufacturer's recommendations or provide multi-size closers, sizes 1 through 6.
4. Material of closer shall be forged or cast iron
5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
6. Closers shall have full size cover.
7. Closers shall have adjustable hydraulic back-check and separate valves for closing and latching speed.

## **2.5 DOOR STOPS**

- A. Conform to ANSI A156.16.
- B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of building construction. For concrete, masonry or quarry tile construction, use lead expansion shields for mounting door stops.
- C. Where cylindrical locks with turn pieces or pushbuttons occur, equip wall bumpers Type L02251 (rubber pads having concave face) to receive turn piece or button.
- D. Substitute floor stops Type L02141 or L02161 as appropriate, when wall bumpers would not provide an effective door stop.
- E. Where drywall partitions occur, use floor stops, Type L02141 or L02161.
- F. Provide stop Type L02011 or L02181, as applicable for exterior doors.
- G. Omit stops where floor mounted door holders are required and where automatic operated doors occur.
- H. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.
- I. Provide appropriate door mounted stop on doors in individual toilets where floor or wall mounted stops cannot be used.
- J. Provide overhead surface applied stop Type C02541, ANSI A156.8 on patient toilet doors where toilet door could come in contact with other amenities.
- K. Provide door stops on doors where combination closer magnetic holders are specified.

## **2.6 OVERHEAD DOOR HOLDERS**

- A. Conform to ANSI Standard A156.8. Overhead holders shall be of sizes recommended by holder manufacturer for each width of door. Set overhead holders for 170 degree opening, unless limited by building construction or equipment.

## 2.7 LOCKS AND LATCHES

- A. Best 47H series mortise locks with lever design to match existing VA standard and meeting ADA (Americans with Disabilities Act) requirements.
- B. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not less than seven pins. Cylinders for all locksets shall be removable core type. Cores shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all locks included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 19 mm (3/4 inch) throw. Provide temporary keying device or construction core to allow opening and closing during construction and prior to the installation of final cores.
- C. In addition to above requirements, locks and latches shall comply with following requirements:
  - 1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locks and latchsets shall be furnished with curved lip strike and wrought box. Furnish armored fronts for all mortise locks. Trim shall be 15J, lever x escutcheon.
  - 2. Furnish final 7-pin cores for the Best Patented system to the VA. The contractor shall retain Stanley Best Shiela Campbell to pin the cores.
  - 3. Provide construction cores with temporary keying device to allow opening and closing during construction and prior to the installation of final cores.
  - 4. Lock Function Legend:
    - a. Classroom (C)
    - b. Storeroom (S)
    - c. Office (E)
    - d. Privacy (P)
    - e. Passage Latch (L)

Letters in ( ) denote functions in door schedule hardware set number.

## 2.8 ELECTRIC STRIKES

- A. ANSI/ BHMA A156.31 Grade 1.
- B. General: Use fail-secure electric strikes with fire-rated devices.

C. Available manufacturers include, and limited to, the following:

1. HES; an ASSA ABLOY Company.
2. Von Duprin; an Ingersoll-Rand Company.

## **2.9 ARMOR PLATES AND KICK PLATES**

A. Conform to ANSI Standard A156.6.

B. Provide protective plates as specified below:

1. Kick plates and armor plates fabricated from stainless steel, 0.050 gauge and screw applied.
2. Kick plates shall be 200 mm (8 inches) high. On push side of doors where jamb stop extends to floor, make kick plates 38 mm (1-1/2 inches) less than width of door, except pairs of doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other combination kick plates to within 6 mm (1/4 inch) of each edge of doors. Kick mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
3. Armor plates shall be 875 mm (35 inches) high and 38 mm (1-1/2 inches) less than width of doors, except on pairs of doors. Plates on pairs of metal doors shall be 25 mm (1 inch) less than width of each door. On doors equipped with exit devices, extend armor plates to within 13 mm (1/2 inch) of panic bolt cross bar.

## **2.10 EXIT DEVICES**

- A. Conform to ANSI Standard A156.3; Von Duprin 99 series, Sargent 80 series.
- B. Exit devices shall be Grade 1; type and function are specified in hardware sets. Provide flush with finished floor strikes for vertical rod exit devices in interior of building. Trim shall have lever handles similar to locksets, unless otherwise specified.
- C. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance.

## **2.11 FLUSH BOLTS (LEVER EXTENSION)**

- A. Conform to ANSI A156.16. Flush bolts shall be Type L24081 unless otherwise specified. Furnish proper dustproof strikes conforming to ANSI A156.16, for flush bolts required on lower part of doors. Modify flush bolts to fit stiles of aluminum doors on double-acting doors.
- B. Face plates for cylindrical strikes shall be rectangular and not less than 25 mm by 63 mm (1 inch by 2-1/2 inches).



- C. Friction-fit cylindrical dustproof strikes with circular face plate may be used only where metal thresholds occur.

#### **2.12 FLUSH BOLTS (AUTOMATIC)**

- A. Conform to ANSI A156.16. Dimension of flush bolts shall conform to ANSI A115. Bolts shall conform to Underwriters Laboratories, Inc., requirements for fire door hardware. Flush bolts shall automatically latch and unlatch. Furnish dustproof strikes conforming to ANSI A156.16 for bottom flushbolt. Face plates for dustproof strike shall be rectangular and not less than 38 mm by 90 mm (1-1/2 by 3-1/2 inches).

#### **2.13 DOOR PULLS**

- A. Conform to ANSI A156.6. Pull plate 90 mm by 350 mm (3-1/2 inches by 14 inches), unless otherwise specified. Cut plates of door pulls for cylinders, or turn pieces where required.

#### **2.14 PUSH PLATES**

- A. Conform to ANSI A156.6. stainless steel, Type J302, 200 mm (8 inches) wide by 350 mm (14 inches) high. Cut plates for cylinders, and turn pieces where required.

#### **2.15 COORDINATORS**

- A. Conform to ANSI A156.16. Coordinators, when specified for fire doors, shall comply with Underwriters Laboratories, Inc., requirements for fire door hardware. Coordinator may be omitted on exterior pairs of doors where either door will close independently regardless of the position of the other door. Coordinator may be omitted on interior pairs of non-labeled open where open back strike is used. Open back strike shall not be used on labeled doors. Paint coordinators to match door frames, unless coordinators are plated.

#### **2.16 THRESHOLDS**

- A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.

#### **2.17 AUTOMATIC DOOR BOTTOM SEAL AND RUBBER GASKET**

- A. Conform to ANSI A156.22.

#### **2.18 WEATHERSTRIPS (FOR EXTERIOR DOORS)**

Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length ( $0.000774\text{m}^3/\text{s/m}$ ).

**2.19 MISCELLANEOUS HARDWARE**

- A. Mutes: Conform to ANSI A156.16. Provide door mutes or door silencers Type L03011, of white or light gray color, on each steel door frame, except lead-lined frames and frames for sound-resistant, lightproof and electromagnetically shielded doors. Furnish 3 mutes for single doors and 2 mutes for each pair of doors, except double-acting doors. Provide 4 mutes or silencers for frames for each Dutch type door. Provide 2 mutes for each edge of sliding door which would contact door frame.

**2.20 FINISHES**

- A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes". For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.
- B. 626 or 630, except where other finishes are specified.
- C. Miscellaneous Finishes:
1. Butt Hinges interior doors: 652.
  2. Door Closers: Factory applied paint finish. Dull or Satin Aluminum color
  5. Thresholds: Mill finish aluminum.
  7. Other primed steel hardware: 652.
- D. Hardware Finishes for Existing Buildings: U.S. Standard finishes shall match finishes of hardware in (similar) existing spaces.
- E. Provide 652 finish at all fire rated doors.

**2.21 BASE METALS**

- A. Apply specified U.S. Standard finishes on different base metals as following:

Finish	Base Metal
652	Steel
626	Brass or bronze
630	Stainless steel

**PART 3 - EXECUTION****3.1 HARDWARE HEIGHTS**

- A. Locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to the COR for approval.

**3.2 INSTALLATION**

- A. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. Closers shall be mounted regular arm. Where closers are mounted on doors they shall be mounted with sex nuts and bolts; foot shall be fastened to frame with machine screws.
- B. Substitute parallel arm or top jamb mounting for regular arm mounting where the following conditions occur:
1. Where door swing, in full open position, would be limited to less than 90 degrees due to partition construction and closer location.
  2. Where door to room opens outward into corridor.
  3. Where exterior doors open outward.
  4. On doors equipped with roller latch.
- C. Hinge Size Requirements:

Door Thickness	Door Width	Hinge Height
45 mm (1-3/4 inch)	900 mm (3 feet) and less	113 mm (4-1/2 inches)
45 mm (1-3/4 inch)	Over 900 mm (3 feet) but not more than 1200 mm (4 feet)	125 mm (5 inches)

- D. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim.
- E. Hinges Required Per Door:

Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts
Doors over 2280 mm (7 feet 6 inches) high	4 butts

- F. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete, ceramic or quarry floor tile, or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.
- G. Armor plates and Kick Plates: When one plate is specified per door, install on push side of door.

**3.3 FIELD QUALITY CONTROL**

- A. Post-Installation Meeting: Prior to occupancy, the general contractor shall schedule and conduct a post-occupancy meeting with the hardware supplier and the manufacturer representative who supplied the

commercial locks, the exit devices and the door controls/closers. The purpose is to eliminate any or all institutional door hardware "punch list" items.

#### **3.4 HARDWARE GROUPS**

A. The Hardware Group Schedule is shown on Drawing sheet AS-890.

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