

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

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Everything necessary for and incidental to the execution and completion of all door hardware work, as indicated on the drawings and specified herein.
- B. Extent of door hardware is shown on the drawings and in the schedules. Door hardware includes all items known commercially as "Builders Hardware" required for swinging, sliding and bi-folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.
- C. Related Sections:
  - 1. Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.
  - 2. Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
  - 3. Section 08 72 10, AUTOMATIC DOOR OPERATORS.

**1.3 REFERENCES**

- A. The publications listed below, including the amendments, addenda and designated changes, form a part of this specification to the extent referenced.
  - 1. Federal Specifications (FS): FF-H-111C-74 Hardware, Builders Shelf and Miscellaneous.
  - 2. National Fire Protection Association (NFPA):
    - a. Standard 80, Fire Doors and Windows.
    - b. Standard 101, Life Safety Code.
  - 3. American National Standards Institute (ANSI):
    - a. ANSI/BHMA A156.1: 2000 Butts & Hinges.
    - b. ANSI/BHMA A156.3: 1994 Exit Devices.
    - c. ANSI/BHMA A156.4: 2000 Door Controls - Closers.
    - d. ANSI/BHMA A156.5: 1992 Auxiliary Locks & Associated Products.
    - e. ANSI/BHMA A156.6: 1994 Architectural Door Trim.
    - f. ANSI/BHMA A156.7: 1997 Template Hinge Dimensions.
    - g. ANSI/BHMA A156.8: 2000 Door Controls - Overhead Holders & Stops.
    - h. ANSI/BHMA A156.13: 1994 Mortise Locks & Latches.

- i. ANSI/BHMA A156.15: 1995 Closer/Holder Release Devices.
- j. ANSI/BHMA A156.16: 1997 Auxiliary Hardware.
- k. ANSI/BHMA A156.17: 1999 Self-Closing Hinges & Pivots.
- l. ANSI/BHMA A156.18: 2000 Materials & Finishes.
- m. ANSI/BHMA A156.19: 1997 Power Assist & Low Energy Power Operated Doors.
- n. ANSI/BHMA A156.21: 1996 Thresholds.
- o. ANSI/BHMA A156.22: 1996 Door Gasketing Systems.
- p. ANSI/BHMA A156.23: 2001 Electromagnetic Locks.
- q. ANSI/BHMA A156.24: 1999 Delayed Egress Locks.
- r. ANSI/BHMA A156.28: 2000 Master Keying.
- 4. Uniform Federal Accessibility Standards (UFAS): Federal Register.
- 5. Door and Hardware Institute (DHI):
  - a. Keying Systems and Terminology.
  - b. Abbreviations and Symbols.
  - c. Recommended Locations for Builder's Hardware for Custom Steel Doors and Frames.

#### **1.4 SUBMITTALS**

- A. General: Submit in accordance with Section 01 33 23.
- B. Product Data: Submit manufacturers' catalog cuts of all items used in the hardware schedule.
- C. Hardware Schedules: Based on hardware indicated, organize hardware schedule into groups or sets showing complete designations of every item required for each door opening. Schedule shall be vertical layout similar to the format used herein. Lines shall be double spaced with pages numbered and dated.
  - 1. For doors of different sizes or where hinges, locks or closers are different, a separate heading shall be used. No labeled openings shall be combined with non-labeled openings. Horizontal hardware schedules are not acceptable. Include the following:
    - a. Number, location, hand, fire rating, size and material of each door opening (hands and swings to be determined in relation to key side of opening).
    - b. Type, style, function, size, finish and quantity of each hardware item.
    - c. Name and manufacturer of each item.
    - d. Fastening requirements.
    - e. Explanation of abbreviations used (use abbreviations and symbols consistent with DHI's "Abbreviations and Symbols" wherever possible).

- f. Special mounting locations and instructions.
  - g. Wiring diagrams (after each corresponding hardware set).
- 2. Combined submittals are not acceptable. Hardware Schedule shall not be combined with door and frame submittals.
- 3. Schedules not adhering to these parameters will not be reviewed.
- D. Hardware Schedule Index: Furnish an index cross referencing Contract Document door number and hardware group, and supplier's hardware set.
- E. Keying Schedule: Submit separate detailed schedule for Government's review after Hardware Schedule has received Resident Engineer's approval.
- F. Operating Instructions: Furnish the Government with one complete set of installation instructions, including special adjusting tools and maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. One complete catalog shall be furnished for each manufacturer listed in the approved hardware schedule.
- G. Templates: Furnish templates for all hardware items contained herein and approved Hardware Schedule to door and frame fabricators. Where fabricator cannot work to paper templates, furnish physical hardware.
  - 1. Ship templates and/or physical hardware to factories of respective manufacturers; prepay costs for shipping and delivery.
- I. Informational Submittals: Submit following:
  - 1. Certifications specified in Quality Assurance article.
  - 2. Qualification Data: Hardware Supplier's qualification data.
- J. Closeout Submittals: Submit specified warranty in accordance with Division 1 Specifications.

#### **1.5 QUALITY ASSURANCE**

- A. General Requirements: Hardware has been specified by manufacturer's name, brand and catalog numbers for purpose of establishing basis for quality, design and operational function.
  - 1. Except where specifically indicated otherwise, equivalent products from other listed manufacturers are also acceptable.
  - 2. Provide designated product, or where more than one product or manufacturer is listed provide equivalent product of one of other listed manufacturers.
  - 3. Obtain each type of hardware from single manufacturer.
  - 4. Hardware Groups within this Section are not complete with respect to thicknesses of doors, hand, backset, method of fastening, and other detail requirements.

5. Review Drawings and Door Schedules thoroughly and provide required hardware for all openings, including openings which may have been inadvertently omitted from Door Schedules.
  6. Should opening be omitted or opening not indicated with hardware set, provide hardware of same quality, design and function as specified for similar openings.
  7. Furnish hardware complete with brackets, plates, fittings, fastenings and other accessories required for installation.
- B. Regulatory Requirements: Comply with Uniform Federal Accessibility Standards to accommodate barrier free design.
1. Provide knurled tactile warning on door hardware to hazardous areas; abrasive coating is not acceptable.
  2. Comply with NFPA 80 for hardware at fire-rated assemblies and NFPA 101 for exit doors.
- C. Certification: After completion of hardware installation, submit written certification attesting that hardware has been installed in accordance with manufacturer's templates and instructions.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with Division 1 Specifications.
1. Pack each hardware item separately. Include manufacturer's printed installation instructions, trim, fasteners, accessories, and special tools necessary for installation.
  2. Legibly mark and adequately label each package, indicating opening for which intended. Provide markings corresponding with approved Hardware Schedule.

#### **1.7 WARRANTY**

- A. Prepare and submit in accordance with Division 1 Specifications.
1. Special Warranty: Provide manufacturer's warranty stating closers will be free from defects in materials and workmanship for period of ten years from date of manufacturer.

### **PART 2 - PRODUCTS**

#### **2.1 TEMPLATE HARDWARE**

- A. Hardware to be applied to metal or pre-finished doors and frames shall be made to template. Coordinate hardware locations to prevent interference with other hardware items.

#### **2.2 HARDWARE ITEMS**

- A. General: Manufacturers name or logo shall not be visible on any finished surface exposed to "public" view.

- B. Hinges: Conform to ANSI/BHMA A156.1. Hinges used on metal doors and/or frames shall also conform to ANSI/BHMA A156.7.
  - 1. Acceptable Manufacturers:
    - a. Bommer Industries, Landrum, NC.
    - b. Hager Companies, St. Louis, MO.
    - c. McKinney, Scranton, PA.
    - d. Stanley Hardware, New Britain, CT.
  - 2. Description: Five knuckle design with square corners.
    - a. Full mortise type.
    - b. Flat button tip and matching plug.
    - c. Non-removable pins for out-swinging exterior doors and for interior reverse bevel doors equipped with locking device; non-rising pins for other doors.
    - d. Non-ferrous construction at locations exposed to exterior atmosphere.
  - 3. Minimum Number Hinges:
    - a. Unless otherwise indicated in the Schedule of Groups, provide two hinges for doors 60-inches or less in height and one additional hinge for each additional 30-inches of height or fraction thereof.
  - 4. Minimum Size:
    - a. Unless otherwise specified, hinges for doors through 36-inches wide shall be 4.5 x 4.5; hinges for doors over 36-inches wide shall be 5 x 4.5.
- C. Surface Mounted Closers: Conform to ANSI/BHMA A156.4, Grade 1.
  - 1. Acceptable Manufacturers:
    - a. LCN Closers, Princeton, IL.
    - b. Rixson, Charlotte, NC.
    - c. Sargent, New Haven, CT.
  - 2. Description: Cast iron with 1 1/2-inch diameter steel pistons with minimum 5/8-inch heat-treated shafts. Closer arms shall be forged and fluid shall accommodate all applicable weather conditions.
    - a. Where factory sized closers are specified, sizes are to be determined by manufacturer's recommendations for door size and location.
    - b. Where parallel arm closers are required, furnish manufacturer's extra-heavy duty arm.
    - c. Furnish for 180-degree swing where partition construction will permit.

3. Required Features:
  - a. Rack and pinion construction with compression spring, fully hydraulic.
  - b. Closing speed and latching speed controlled by independently operated valves.
  - c. Adjustable spring power allowing adjustment up to 50 percent in field to suit individual door conditions.
  - d. Adjustable hydraulic backcheck.
  - e. Hold open and dead-stop features where indicated in Schedule of Groups.
4. Accessories: Manufacturer's standard non-metallic, full cover.
  - a. Furnish with necessary arms, tracks, brackets, plates, shoes, and other accessories to suit door and frame conditions.
5. Mounting: Locate surface mounted closers on the least conspicuous side of the door (side opposite public view).
- D. Standard Cylinders: Conform to ANSI/BHMA A156.5.
  1. Acceptable Manufacturer:
    - a. Corbin Russwin Architectural Hardware, Charlotte, NC.
  2. Provide cylinders for locksets, deadlocks, exit devices, and other control and locking devices indicated in Schedule of Groups.
  3. Description: Interchangeable core type with a minimum of six pins. All cylinders shall be equipped with temporary cores for use during construction.
- E. Narrow Stile Deadlocks and Deadlatches: Conform to ANSI/BHMA A156.5, Grade 1.
  1. Acceptable Manufacturers:
    - a. Adams Rite Manufacturing Co., City of Industry, CA.
    - b. Approved Equal.
  2. Acceptable Products:
    - a. Deadlock: Adams Rite MS1850A.
    - b. Bottom Rail Deadlock: Adams Rite MS1861.
    - c. Deadlatch: Adams Rite 4710.
  3. Faceplate: Beveled, flat or radius to suit installation requirements.
    - a. Finish to match trim.
  4. Strike: Manufacturer's standard.
    - a. Equip with wrought or plastic box.
    - b. Finish to match trim.
- F. Overhead Holders and Stops: Conform to ANSI/BHMA A156.8.
  1. Acceptable Manufacturers:

- a. Architectural Builders Hardware, Elk Grove Village, IL.
    - b. Glynn-Johnson, Chicago, IL.
    - c. Rixson, Charlotte, NC.
  - 2. Description: Non-handed with shock absorbing coil springs with rubber inserts. Arms and channels shall be made of extruded bronze.
  - 3. Where wall or floor stops will not work, furnish concealed overhead stops equal to Glynn-Johnson 410S Series.
- G. Locksets, Latchsets and Deadlocks: Conform to ANSI/BHMA A156.13, Series 1000, Grade 1.
- 1. Acceptable Manufacturers:
    - a. Baldwin Hardware Corporation, Reading, PA.
    - b. Best Lock Corporation, Indianapolis, IN.
    - c. Corbin Russwin Architectural Hardware, Charlotte, NC.
    - d. Sargent, New Haven, CT.
    - e. Schlage Lock Company, San Francisco, CA.
    - f. Yale Security, Inc., Charlotte, NC.
  - 2. Description:
    - a. Mortise locks and latches shall be equal to Sargent 8200 Series.
      - (1) Furnish mortise locks and latches with stainless steel anti-friction deadlocking latch bolts.
      - (2) All internal working parts shall be brass, bronze, steel or stainless steel.
    - b. Trim Design:
      - (1) equal to Baldwin Hardware Corporation 5137 / 5006.
    - c. For each lock and latchset, provide strike box and square corner ASA strike with curved lips of sufficient length to protect frames.
- H. Auxiliary Hardware: Conform to ANSI/BHMA A156.16.
- 1. Acceptable Manufacturers:
    - a. Builders Brass Works / Trimco, Los Angeles, CA.
    - b. Hager Companies, St. Louis, MO.
    - c. Ives, Wallingford, CT.
    - d. Rockwood Manufacturing Co., Rockwood, PA.
  - 2. Manual Flush Bolts: Top manual flush bolts shall not exceed 74-inches from floor to centerline.
    - a. Provide standard strikes with wrought boxes for top bolts.
  - 3. Door Stops: Unless otherwise indicated in the Schedule of Groups, furnish cast wall stops equal to Rockwood 400 wherever trim

- strikes wall. Where wall stops are not suitable, furnish cast floor stops equal to Rockwood 441CU (with removable riser).
4. Silencers: Furnish rubber silencers equal to Rockwood 608 for hollow metal frames; three per single and four per pair.
- I. Thresholds: Conform to ANSI/BHMA A156.21.
1. Acceptable Manufacturers:
- a. Hager Companies, St. Louis, MO.
  - b. National Guard Products, Inc., Memphis, TN.
  - c. Pemko Inc., Ventura, CA.
  - d. Reese Enterprises, Inc. Rosemount, MN.
  - e. Zero International, Inc. Bronx, NY.
2. Description: Refer to the Schedule Groups for grade and style. All thresholds shall provide proper clearance and an effective seal with specified gasketing. Thresholds shall not exceed 1/2-inch overall height.
- a. Latching thresholds shall also conform to ANSI/BHMA A156.3, Type 26 and shall be of such height that the bottom of the door rests 1/8-inch over the tread of the threshold and 1/8-inch below the top of the stop.
  - b. Where required, modify thresholds to receive strikes for exit devices and flush bolts.
- J. Weather-stripping and Seals: Conform to ANSI/BHMA A156.22.
1. Acceptable Manufacturers:
- a. Hager Companies, St. Louis, MO.
  - b. National Guard Products, Inc., Memphis, TN.
  - c. Pemko Inc., Ventura, CA.
  - d. Reese Enterprises, Inc. Rosemount, MN.
  - e. Zero International, Inc. Bronx, NY.
2. Description: Refer to the Hardware Sets for grade and style.
- a. Adhesive Gasketing: Furnish silicon based, self-adhesive, compression type gasketing for use on metal and wood frames. Product shall be listed for use on fire-rated doors bearing up to a 1.5-hour label. Gasketing color shall be gray.
  - b. Aluminum housed seals shall consist of extruded aluminum retainers not less than 1/16-inch wall thickness with closed cell, sponge neoprene inserts. Neoprene material shall be of an industrial/commercial grade. Seals shall remain functional through all applicable weather and temperature conditions.

- c. Automatic door bottoms shall be constructed of extruded aluminum with adjustable rods and closed cell, sponge neoprene inserts.

K. Operating Trim: Comply with BHMA A156.6.

1. Acceptable Manufacturers:

- a. Baldwin Hardware Corporation (BH).
- b. Burns Manufacturing Incorporated (BM).
- c. Don-Jo Mfg., Inc. (DJO).
- d. Forms + Surfaces (FS).
- e. Hager Companies (HAG).
- f. HEWI, Inc. (HEW).
- g. Hiawatha, Inc. (HIA).
- h. Ives: H. B. Ives (IVS).
- i. NT Quality Hardware; an Ingersoll-Rand Company (NTQ).
- j. Rockwood Manufacturing Company (RM).
- k. Stanley Commercial Hardware; Div. of The Stanley Works (STH).
- l. Triangle Brass Manufacturing Company, Inc. (TBM).

2. Materials: Fabricate from stainless steel, unless otherwise indicated.

3. Flat Push Plates: 0.050 inch thick, 4 inches wide by 16 inches high; with square corners and beveled edges, secured with exposed screws.

4. Straight Door Pulls: 3/4-inch constant-diameter pull, with minimum clearance of 1-1/2 inches from face of door; fastened at 8 inches o.c.

L. DOOR BOLTS, GENERAL

1. Flush Bolts: BHMA A156.16, Grade 1, unless Grade 2 is indicated, designed for mortising into door edge.

- a. Adams Rite Manufacturing Co.
- b. Burns Manufacturing Incorporated.
- c. Cal-Royal Products, Inc.
- d. Door Controls International.
- e. Glynn-Johnson; an Ingersoll-Rand Company.
- f. Hager Companies.
- g. Hiawatha, Inc.
- h. Ives: H. B. Ives.
- i. NT Quality Hardware; an Ingersoll-Rand Company.
- j. Rixson-Firemark, Inc.; Div. of Yale Security Inc.
- k. Rockwood Manufacturing Company.
- l. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc.

m. Triangle Brass Manufacturing Company, Inc.

## **2.3     **HARDWARE FINISHES****

- A. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturers standard metal alloy composition, temper and hardness, but in no case of lesser quality than specified or inferred by use of a particular manufacturer's number, style or grade or as established by appropriate referenced specification listed herein.
- B. Finishes: Finishes shall conform to the 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 the standards established by ANSI/BHMA A156.18 or Federal Specifications FF-H-111C as applicable.
  - 1. All exposed hardware except exit devices, closers and hinges shall be satin stainless steel (ANSI/BHMA 630/US32D).
    - a. Exit devices shall have satin extruded aluminum cases, satin chrome plated (ANSI/BHMA 626/US26D) trim, and satin stainless steel push pads.
    - b. Unless otherwise indicated in the Schedule of Groups, closers shall be painted to match satin stainless steel. Where indicated, closers shall have both covers and arms satin chrome plated with closer arms ground smooth prior to plating.
    - c. Items of hardware not available in stainless steel shall be furnished with a satin chrome finish.
  - 2. Where indicated in the Schedule of Groups, all exposed hardware except closers, push-pulls and flat goods shall be polished chrome plated (ANSI/BHMA 625/US26).
    - a. Closers shall be painted to match polished chrome.
    - b. Push-pulls and flat goods shall be polished stainless steel (ANSI/BHMA 629/US32).
    - c. Items of hardware not available chrome plated shall be furnished in polished stainless steel.
  - 5. Where painting of primed surfaces is required, refer to Division 9 specifications.

## **2.4     **KEYING****

- A. Keying: All cylinders shall be keyed into existing Grand Master Key System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset.

Cylinders shall be 7 pin type. Keying information shall be furnished at a later date by the resident Engineer.

## **2.5 FASTENERS**

- A. General: Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping or sheet metal screws except as specifically indicated.
  - 1. Furnish screws for installation with each hardware item. Provide Phillips flat head or oval head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such work as closely as possible, except as otherwise indicated.
    - a. Where wood screws are required they shall be full thread (to the head) type. Combination wood/machine screws, in lieu of wood screws, are not acceptable.
  - 2. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed fasteners. Do not use through bolts for installation except where it is not possible to adequately reinforce the work, to accept machine screws or concealed fasteners or another standard type, to satisfactory avoid the use of through bolts. Grommet nuts and cealnuts are not acceptable.
- B. Furnish fasteners which are compatible with both the unit fastened and the substrate, and which will not cause corrosion or deterioration of hardware, base material reinforcement or fastener. Furnish wall stops with expansion anchors and machine screws. Furnish thresholds and floor stops with lead anchors and 1/4-20 brass or stainless steel machine screws.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine conditions and proceed with Work in accordance with Division 1 Specifications.

### **3.2 INSTALLATION**

- A. Install hardware plumb, level, and true to line in accordance with manufacturer's templates, and Project conditions.

1. Where cutting and fitting is required on substrates to be field painted or similarly finished, install, fit, remove and store hardware prior to finishing. Reinstall hardware after finishing operations are completed.
  2. Do not install surface mounted items until finishes have been completed on the substrate.
  3. Reinforce attachment substrates as necessary for installation and operation.
  4. For substrates that are not factory prepared for hardware:
    - a. Mortise work to correct size and location without gouging, splintering or causing irregularities in exposed finish work.
  5. Hinges: Where shimming is required to comply with tolerances, provide metal shims only.
  6. Fit faces of mortised components snug and flush without excessive clearance.
  7. Set thresholds at exterior doors in bed of sealant. Remove excess sealant.
- B. Hardware Mounting Heights: Mount hardware units at heights recommended by DHI (see "Recommended Locations for Builders Hardware") on custom doors except as otherwise indicated or required to comply with governing regulations, and except as may be otherwise indicated.

### **3.3 ADJUSTING, CLEANING, AND DEMONSTRATING**

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation and 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 an 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.
  2. 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.
  3. Clean adjacent surfaces soiled by hardware installation.
  4. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
  5. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the Installer, accompanied by

representatives of the manufacturers of latchsets and locksets, door control devices and exit devices, shall return to the Project to perform the following work:

- a. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
- b. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
- c. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.

### 3.4 SCHEDULE OF GROUPS

- A. The Hardware Groups listed below indicate the items of hardware required for each opening. It is the bidder's responsibility to accurately furnish the proper sizes, quantities, weights, gauge and functions as required by these specifications and as recommended by manufacturers involved.

1. Group H101 - @ Exterior Storefront Door (Pair)  
Hinges  
2 Storefront Manufacturer's standard Push/Pull set  
1 Surface mounted closer  
1 Top and Bottom Flush bolts - inactive leaf  
1 Storefront Manufacturers standard Astrigal  
1 Deadlock  
2 Retractable sweep on door  
2 set Weather-stripping - Head & Jambs
2. Group H102 - @ Exterior Door  
Hinges  
1 Lockset - Entry Function  
1 Deadlock  
1 Surface mounted closer  
1 Threshold  
1 set Weather-stripping - Head & Jambs
3. Group H107- @ Toilet Room Door  
Hinges  
1 Push Plate/ Pull Handle  
1 Surface mounted closer  
1 Kick plate  
1 Stop

Fort Sam Houston National Cemetery  
Restroom Building 846CM3040

April 3, 2012

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DOOR HARDWARE  
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