

## **SECTION 08 71 00 - DOOR HARDWARE**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes door hardware.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data: Submit product data including installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples: Submit samples of exposed door hardware for each type indicated below, in specified finish. Tag with full description for coordination with the Door Hardware Schedule.
  - 1. Door Hardware: As follows:
    - a. Locks and latches.
    - b. Operating trim.
    - c. Coat hooks.
  - 2. Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.
- C. Door Hardware Schedule: Submit door hardware schedule prepared by or under the supervision of door hardware supplier. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware. The Architect's review of schedule shall neither be construed as a complete check nor shall it relieve the Contractor of responsibility for errors, deviations, or omissions from the specified requirements to provide complete door hardware for the project.
  - 1. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
    - a. Organize door hardware sets in same order as in the Door Hardware Schedule..
  - 2. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.

- f. Mounting locations for door hardware. Supply templates to door and frame manufacturer(s) to enable proper and accurate sizing and locations of cutouts for hardware. Detail conditions requiring custom extended lip strikes, or other special or custom conditions.
  - g. Door and frame sizes and materials.
  - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
    - 1) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
- D. Keying Schedule: Submit keying schedule prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.
- E. Warranties: Submit special warranties specified in this Section.
- F. Fire-Rated Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

### **1.3 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: Submit maintenance data for each type of door hardware. Include final hardware and keying schedule.
- B. Warranties: Submit special warranties specified in this Section.
- C. Fire-Rated Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Supplier Qualifications: Door hardware supplier, who has completed a minimum of three (3) projects over the last five (5) years which were similar in material, design and extent to that indicated for the project and which have resulted in construction with a record of successful in service performance, and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
  - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

- C. Source Limitations: Obtain each type of door hardware from a single manufacturer, unless otherwise indicated.
- D. Regulatory Requirements: Comply with the following:
  - 1. Provide hardware items complying with the applicable provisions for accessibility and usability by the disabled and handicapped in compliance with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1.
  - 2. NFPA 101: Comply with applicable provisions for means of egress doors.
  - 3. Electrified Door Hardware: Listed and classified by Underwriter's Laboratories, Inc. or by a testing agency acceptable to authorities having jurisdiction, as suitable for the purpose indicated.
- E. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by Underwriter's Laboratories, Inc. for fire ratings indicated, based on testing according to NFPA 252. Provide only door hardware items that are identical to items tested by UL for the types and sizes of doors required. In case of conflict between type of hardware specified and type required for accessibility or fire protection, furnish type required by NFPA and UL. Doors indicated in fire rated partitions and walls shall be positive latching and self-closing, with smoke gaskets where required by applicable codes.
  - 1. Wherever exit device hardware is required on doors, comply with UL 305. Furnish hardware to door manufacturer for installation at factory. Provide supplementary label, "Fire Exit Hardware," on each exit device to certify that panic hardware has been panic load tested with door.

## **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

## **1.6 COORDINATION**

- A. Coordinate layout and installation of recessed pivots and closers with floor construction.
- B. Templates: Furnish templates and door hardware schedules, coordinated for the application of door hardware items with door and frame details, to door opening fabricators and trades performing door opening work to permit the preparation of doors and frames to receive the specified door hardware. Where the door hardware item scheduled is not adaptable to the finished size of door opening members requiring door hardware, submit an item having a similar operation and quality to the Architect for review. Each door hardware item shall be fabricated to templates.

- C. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to, power supplies, fire alarm system and detection devices, access control system, security system, building control system.
- D. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

## **1.7 WARRANTY**

- A. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
  - 1. Faulty operation of door hardware.
  - 2. Deterioration of metals, metal finishes, and other materials beyond normal use.
- B. Warranty Period for Electromagnetic Locks: Five years from date of Substantial Completion.
- C. Warranty Period for Manual Closers: Ten years from date of Substantial Completion.
- D. Warranty Period for Concealed Floor Closers: Five years from date of Substantial Completion.
- E. Warranty Period for Exit Devices: Five years from date of Substantial Completion.
- F. Warranty Period for Other Hardware: Two years from date of Substantial Completion.
- G. Warranty for Mortised Mechanical Lock and Latchsets: Ten years from date of Substantial Completion.
- H. Warranty for Heavy Duty Cylindrical Mechanical Lock and Latchsets: Seven years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 SCHEDULED DOOR HARDWARE**

- A. General: Provide door hardware for each door to comply with requirements in this Section, , and the Door Hardware Schedule.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products.
  - 2. The hardware supplier shall review each hardware set and compare it with the door types, details, and sizes as shown and verify each hardware item for function, hand, backset, and method of fastening through shop drawing submittals.

## **2.2 HINGES AND PIVOTS**

### **A. Butt Hinge Products and Manufacturers:**

1. Standard Weight, Ball Bearing, 5 Knuckle, Steel: Complying with BHMA A156.1 A8112, one of the following:
  - a. BB5000; Bommer Industries, Inc., Landrum, SC (BI).
  - b. BB1279; Hager Companies (HAG).
  - c. TA2714; McKinney Products Company (MCK).
  - d. FBB179; Stanley Commercial Hardware (STH).
2. Heavy Weight, Ball Bearing, 5 Knuckle, Steel: Complying with BHMA A156.1 A8111, one of the following:
  - a. BB5004; Bommer Industries, Inc., Landrum, SC (BI).
  - b. BB1168; Hager Companies (HAG).
  - c. T4A3786; McKinney Products Company (MCK).
  - d. FBB168; Stanley Commercial Hardware (STH).
3. Heavy Weight, Ball Bearing, 5 Knuckle, Stainless Steel: Complying with BHMA A156.1 A5111, one of the following:
  - a. BB5006; Bommer Industries, Inc., Landrum, SC (BI).
  - b. BB1199; Hager Companies (HAG).
  - c. T4A3386-32D; McKinney Products Company (MCK).
  - d. FBB199(US32D); Stanley Commercial Hardware (STH).

### **B. Butt Hinge and Offset Pivot Hinge Quantity: Provide the following, unless otherwise indicated:**

1. Two Hinges: For doors with heights up to and including 60 inches.
2. Three Hinges: For doors with heights of greater than 60 inches to and including 90 inches
3. Four Hinges: For doors with heights greater than 90 inches to and including 120 inches
4. Provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

### **C. Butt Hinge Sizes: 4-1/2 inches h. x 4 inches or 4-1/2 inches w. for doors up to and including 36 inches in width; 5 inches h. x 4 inches or 4-1/2 inches w. for doors greater than 36 inches in width.**

### **D. Hinge Characteristics: Full mortise type with square corners. All butt hinges are to have non-rising pins. Provide only steel bodied butt and pivot hinges at labeled doors. All butt hinges shall be furnished with button tips. Provide heavy weight, ball bearing, hinges at doors 40 inches and greater in width.**

### **E. Fasteners: Package all hinges and pivots with machine and wood screws as required by door and frame construction.**

## 2.3 LOCKS AND LATCHES

- A. Bored Lock and Latch Sets: Extra heavy duty, commercial, cylindrical bodies complying with BHMA A156.2 Series 4000, Grade 1. Furnish cylindrical type, field reversible, lock and latch sets with deadlocking brass or stainless steel latch bolts having a minimum 1/2 inch throw together with guard (auxiliary) latch added to bolt, 2-3/4 inches backset, and UL listed for 3 hour single doors. Furnish latch bolts having a minimum 3/4 inch throw together with guard (auxiliary) latch added to bolt, and UL listed for labeled pairs of fire doors. All lock and latch sets, to be furnished complete with heavy gage steel zinc dichromate coated cylindrical bodies, trim, 2-1/4 inches by 1-1/8 inches beveled square cornered fronts, and 6 pin tumbler key in lever core. Provide wrought steel, aluminum, or black plastic, box strikes for each lock and latch set with curved lips of sufficient length to protect frames. Provide plated cast zinc levers with plated wrought brass or bronze roses. Where electro-mechanical locksets are scheduled provide transformers properly sized for conversion of power supply to the power characteristics of the electromechanical locksets. Where electro-mechanical locksets are scheduled provide request to exit (REX) monitoring feature.
1. Sargent 10 Line, LL Design; Sargent Manufacturing Company (SGT). Where electro-mechanical locksets are scheduled provide 10G70 Series with trim matching mechanical locksets.
  2. Corbin-Russwin CL3300 Series, Newport NZD Design; Corbin Russwin Architectural Hardware (CR). Where electro-mechanical locksets are scheduled provide CL33900 Series with trim matching mechanical locksets.
  3. Schlage ND-Series, Rhodes RHO; Schlage Lock Company (SCH). Where electro-mechanical locksets are scheduled provide ND Series Electrified Locks with trim matching mechanical locksets.
- B. Mortise Lock and Latch Sets: Heavy duty, commercial, mortise bodies complying with BHMA A156.13 Series 1000, Grade 1, with throughbolted lever trim. Furnish mortise type, field reversible without disassembly, field multifunctional without opening lock cases, lock and latch sets with 1 or 2 piece anti-friction deadlocking stainless steel latchbolts having a minimum 3/4 inch throw, 2-3/4 inches backset, and UL listed for 3 hour doors. All lock and latch sets, to be furnished complete with heavy 0.109 inch (12 gage) wrought steel zinc dichromate or chrome plated case, trim, adjustable beveled square cornered armored fronts, cold forged steel or stainless steel hubs, and 6 pin cylinders. Conceal fastenings, washers and bushings. Provide wrought, or black plastic, box strikes for each lock and latch set. Provide brass, bronze or stainless steel strikes with curved lips of sufficient length to protect frames. Provide solid forged or cast levers with wrought roses. Where electro-mechanical locksets are scheduled provide transformers properly sized for conversion of power supply to the power characteristics of the electromechanical locksets. Where electro-mechanical locksets are scheduled provide request to exit (REX) monitoring feature.
1. Sargent 8200 Series, LNJ Design x 130 KB Turnlever; Sargent Manufacturing Company (SGT). Provide handed ANSI 4-7/8 inch curved lip strikes die punched to match bolts provided with latchset functions only, provide non-handed standard curve lip strikes 82-0110 for all other functions. Where electro-mechanical locksets are scheduled provide 8270 Series with trim matching mechanical locksets.

2. Corbin-Russwin ML2000 Series, Lustra LSA Design x 519F10 Thumbturn Lever; Corbin Russwin Architectural Hardware (CR). Provide handed ANSI 4-7/8 inch curved lip strikes die punched to match bolts provided with latchset functions only 340L62 (RH) and 340L63 (LH), provide handed standard curve lip strikes for all other functions 340L60 (RH) and 340L61 (LH). Where electro-mechanical locksets are scheduled provide ML20900 ECL Series with trim matching mechanical locksets.
3. Schlage L9000 Series, 03 Design x A Rose x 09-905 Turnlever; Schlage Lock Company (SCH). Provide handed ANSI 4-7/8 inch curved lip strikes die punched to match bolts provided with latchset functions only (Part No. XL11-820/XL11-821), provide non-handed standard curve lip strikes for all other functions 10-072. Where electro-mechanical locksets are scheduled provide L9000EL Series with trim matching mechanical locksets.
4. Best 45H Series, with 3 Lever Design x H Rose x Thumbturn; Stanley Security Solutions. Provide handed ANSI 4-7/8" curved lip strikes die punched to match bolts provided with latchset functions only S5, provide handed standard curve lip strikes for all other functions S6. Where electro-mechanical locksets are scheduled provide 45HW Series with trim matching mechanical locksets.

## 2.4 DOOR BOLTS

- A. Manual Surface Bolts: Provide 12 inch surface mounted slide bolts UL Listed for A labeled metal fire doors and complying with BHMA A156.16, Type 84161. Furnish manufacturers standard guide brackets and strikes for conditions indicated.
  1. 1012F; Door Controls International (DCI).
  2. SB453-12; Ives (IVS).
  3. 580-12; Rockwood Manufacturing Company (RM).
- B. Manual Flush Bolts: Provide flush bolts, with 1 inch wide fronts, in paired sets (top and bottom), with 1/2 inch diameter flattened bolt tip for both wood and metal doors and standard 12 inch rod at flushbolts for metal doors. Flush bolts shall fit ANSI A115.4 door and frame preparation. Bolts to comply with BHMA A156.16, Type L14081, L14251, L04261 or L24081. Furnish rods of proper length to afford easy reach from the floor. Furnish manufacturers standard top strikes for top bolts.
  1. Manual Flushbolts for Wood Doors: One of the following:
    - a. No. 790F; Door Controls International (DCI).
    - b. FB358; Ives (IVS).
    - c. 3913; Trimco Hardware (TBM).
    - d. 557; Rockwood Manufacturing Company (RM).
  2. Manual Flushbolts for Metal Doors: One of the following:
    - a. No. 780F; Door Controls International (DCI).
    - b. FB458; Ives (IVS).
    - c. 3917; Trimco Hardware (TBM).
    - d. 555; Rockwood Manufacturing Company (RM).

## **2.5 EXIT DEVICES**

- A. Exit Devices: Exit devices and exit device accessories shall conform to BHMA A156.3, Grade 1. Trim shall be wrought construction and commercial plain design with straight, beveled or smoothly rounded sides, corners and edges. Keyed devices shall be furnished less cylinders. Cylinders shall be as herein specified keyed to building system.
- B. Push Pad Style Exit Devices: :
  - 1. 99 Series, function and trim as scheduled; Von Duprin (VD).

## **2.6 CYLINDERS AND KEYING**

- A. Cores for Bored Cylindrical Locksets: Provide key-in lever 6 pin cores for all bored cylindrical locksets, keyed into base building system, as manufactured by the bored lockset manufacturer.
- B. Cylinders: Full faced cylinders with square shouldered (not tapered) compression rings, 6 pin cylinders, standard threaded, keyed into building system, with cams to suit lock functions. Provide cylinders for installation into all locks.
  - 1. 1100 Series Flexible Head Mortise Cylinder; Corbin Russwin Architectural Hardware (CR).
  - 2. Series 40 Adjustable Front Cylinder; Sargent Manufacturing Company (SGT).
  - 3. 30-001 full-faced mortised cylinder with 36-083 compression rings; Schlage Lock Company (SCH).
  - 4. 1E Series with Straight Rings ; Stanley Security Solutions.
- C. Keying System: Final keying to determine lock cylinders, keyed alike sets, level of keying, master key groups, grandmaster keying system shall be as directed by the Owner. Supplier and Contractor shall meet with the Owner and obtain final instructions in writing. Provide 2 nickel silver keys for each lock, and 6 keys for each grandmaster and masterkey system. Provide 2 blank keys for each lock for the Owner's convenience in making additional keys.
  - 1. Temporary Cylinders: Provide temporary cylinders in locks during construction and as may be necessary for security or as may be requested by the Owner. All temporary cylinders shall be individually keyed as required and subject to a single master key.
- D. Key Control System: Furnish a key control system with complete accessories including key gathering envelopes, labels, reserve pattern key tags with self-locking key clips, key receipt forms, key receipt holders, 3 way visible card index, temporary key markers and permanent key markers.



## 2.7 STRIKES

- A. Strikes for Locks and Latches: All strikes for locks and latches shall be provided by the lock and latch manufacturer unless otherwise specified or scheduled, refer to Article 'Locks and Latches'.
- B. Dustproof Floor Strikes: Complying with BHMA A156.16, Type L04251, L04021 or L14021, one of the following:
  - 1. No. 80; Door Controls International.
  - 2. DP2; Ives.
  - 3. 3910; Trimco Hardware (TBM).
  - 4. 570; Rockwood Manufacturing Company (RM).
- C. Electric Strikes: Complying with BHMA A156.31, Grade 1. Mortised type for devices mounted in hollow metal frames. . Provide each strike with extended lips as required to suit jamb conditions and fail secure function. Remote electrical control from card reader or control panel will unlock strike jaw, releasing latchbolt of the deadlatch, so door can be opened without operating latch by key cylinders from outside of secured room. Electric strikes shall be UL listed for up to 3 hour fire door assemblies.
  - 1. Adams Rite: Ultraline Series

## 2.8 OPERATING TRIM (PUSHES AND PULLS)

- A. Type 1: Fabricate push pulls for back to back mounting from 1 1/4" x 1 1/4" stainless steel bar or tube stock in finish as scheduled. Custom fabricate push pulls to length indicated with minimum 3-inch projection, minimum 2-inch clearance with bases centered on door stiles and anchored to top and bottom rails. Furnish spacers threaded to accept concealed throughbolt attachment including provision for spanner tightening of bolts of assembly. Do not provide baseplates at stile to pull interface.
  - 1. RM7940 GeoMetek ; Rockwood Manufacturing Company (RM).

## 2.9 ACCESSORIES FOR PAIRS OF DOORS

- A. Tubular Coordinators and Filler Bars: UL listed for use on labeled doors and complying with BHMA A156.3, Type 21A. Provide with filler piece of length as required to close the header area and mounting brackets at stop mounted hardware. Furnish extenders at active leaf levers where required to clear overlapping astragals on doors installed with pocket pivot hinges or jambs with deep jamb stops.
  - 1. No. 600 Series x Filler Bar; Door Controls International (DCI).
  - 2. COR Series Coordinators x FL filler; Ives (IVS).
  - 3. 1600 Series x FB Series Filler Bar; Rockwood Manufacturing Company (RM).

- B. Coordinator Brackets: UL listed for use on labeled doors and complying with BHMA A156.3, Type 21B. Minimum 7-inch projection.
  - 1. No. 500 Coordinator; Door Controls International (DCI).
  - 2. CORG7; Ives (IVS).
  - 3. 576; Rockwood Manufacturing Company (RM).
  
- C. Carry Open Bars: UL listed for use on labeled doors and complying with BHMA A156.3, Type 21. Provide carry-open bars for inactive leaves of pairs of doors, unless automatic or self-latching bolts are used.
  - 1. No. CB Carry Bar; Door Controls International (DCI).
  - 2. CB1 Carry Bar; Ives (IVS).
  - 3. 1100; Rockwood Manufacturing Company (RM).
  
- D. Astragals: UL listed for use on labeled doors, surface applied continuous extruded aluminum minimum 7/8" wide retaining EPDM gaskets for installation on both sides of all meeting stiles of doors:
  - 1. 125NA; National Guard Products, Inc. (NGP).
  - 2. 305CN; Pemko Manufacturing Co., Inc. (PEM).
  
- E. Lock Protectors: Fabricated from heavy gauge metal and in finish as scheduled. Fabricate lock protectors with no exposed fasteners on face of lock protector. Furnish protectors sized to cover the latch bolt area of the door and lock and narrow enough to clear rose and escutcheon lock trims, offset formed to clear strike projection. Machine lock protectors where required to accommodate rose and escutcheon trims, and cylinders.
  - 1. LG Series Lock Guards; Ives (IVS).
  - 2. Latch Guard 320; Rockwood Manufacturing Company (RM).

## **2.10 CLOSERS**

- A. Surface-Mounted Closers with Track Arms: Closers shall be certified by ETL laboratories and the manufacturer to a minimum of 8,000,000 cycles and meet BHMA A156.4, Grade 1. Closers used in conjunction with overhead stops and holders shall be templated and coordinated to function properly. Properly detail closers to meet application requirements by providing drop plates, brackets, etc. to meet application and installation requirements as indicated. Comply with manufacturer's recommendations for size of door closer depending on size of door, stack pressure conditions, exposure to weather, and anticipated frequency of use. Closers shall have adjustable spring power, full rack and pinion, independent closing speed and latch regulating V-slotted valves, fully hydraulic with a high strength cast iron cylinder and solid forged steel arms, bore diameter of 1-1/2 inches (38.1 mm), pinion shaft diameter of 5/8 inches (15.87 mm), adjustable back check, cushion and built-in stop feature where scheduled, hold open arms where scheduled, delayed action where scheduled, arm finish to match closer cover finish scheduled. Provide metal covers of clean line design with plated or primed for paint finish as scheduled and that require removal in order to make adjustments to closer.

1. 4011T; LCN Closers (LCN).
  2. 281 with Track Arm; Sargent Manufacturing Company (SGT).
- B. Surface-Mounted Closers Without Track Arms : Closers shall be certified by ETL laboratories and the manufacturer to a minimum of 8,000,000 cycles and meet BHMA A156.4, Grade 1. Closers used in conjunction with overhead stops and holders shall be templated and coordinated to function properly. Properly detail closers to meet application requirements by providing drop plates, brackets, etc. to meet application and installation requirements as indicated. Comply with manufacturer's recommendations for size of door closer depending on size of door, stack pressure conditions, and anticipated frequency of use. Closers shall have adjustable spring power, full rack and pinion, independent closing speed and latch regulating V-slotted valves, fully hydraulic with a high strength cast iron cylinder and solid forged steel arms, bore diameter of 1-1/2 inches, pinion shaft diameter of 5/8 inches, adjustable back check, cushion and built-in stop feature where scheduled, hold open arms where scheduled, delayed action where scheduled, arm finish to match closer cover finish scheduled. Provide metal covers of clean line design with plated or primed for paint finish as scheduled and that require removal in order to make adjustments to closer.
1. 4110/4010; LCN Closers (LCN).
  2. 281; Sargent Manufacturing Company (SGT).
- C. Overhead Concealed Closers, Butt and Offset Hung: Closers shall meet BHMA A156.4, Grade 1. Properly detail closers to meet application and installation requirements as indicated. Comply with manufacturer's recommendations for size of door closer depending on size of door, stack pressure conditions, and anticipated frequency of use. Provide manufacturers standard cover plate finished to match exposed portions of butts or pivots provided.
1. 2010/2030; LCN Closers (LCN).
  2. RTS 88-BI Series, Offset Slide Arm, barrier free function; Dorma.
- D. Overhead Concealed Closers, Center Hung: Closers shall meet BHMA A156.4, Grade 1. Properly detail closers to meet application and installation requirements as indicated. Comply with manufacturer's recommendations for size of door closer depending on size of door, stack pressure conditions, and anticipated frequency of use. Provide manufacturers standard cover plate finished to match exposed portions of pivots provided. Provide with manufacturers standard top arm and pivot to suit conditions indicated.
1. 6030; LCN Closers (LCN).
  2. RTS 88-BI Series, End Loaded Arm, barrier free function; Dorma.
- E. Electromagnetic Overhead Surface Closers: Closers shall meet BHMA A156.15 and NFPA 101. Properly detail closers to meet application requirements by providing drop plates, brackets, etc. to meet application and installation requirements as indicated. Comply with manufacturer's recommendations for size of door closer depending on size of door, stack pressure conditions, and anticipated frequency of use. Arm and track finish to match closer cover finish scheduled. Provide metal covers of clean line design with plated or primed for paint finish as scheduled and that require removal in order to make adjustments to closer. Furnish closers for 24 V AC/DC voltage.

1. Sentronic 4040SE; LCN Closers (LCN).
- F. Floor Closers: Closer sizes shall be as recommended by the manufacturer for size of door, stack pressure conditions, and anticipated frequency of use with special details as follows:
1. Special Details:
    - a. Closer Cover Pan: Where stone or ceramic tile flooring is indicated at door thresholds and a special dress plate is not indicated or scheduled, furnish metal pan specially constructed and designed to be installed below and to support removable sections of finished flooring.
    - b. Extended Spindles: Furnish extended spindles.
    - c. All floor closers shall be manufactured with separate independent valves for closing adjustment, latching adjustment, and backchecking adjustment.
    - d. All floor closers shall be provided with a built-in positive deadstop to prevent doors from swinging beyond the desired opening degree.
  2. Center Hung, Single Acting, Heavy Duty: 28 Series; with special machined fully concealed arm, non-hold open (NHO), Checkmate No. 1 holders, physically handicapped (PH), delayed action (DA), as scheduled; Rixson- Firemark, Inc. (RIX).
  3. Offset Hung Heavy Duty: 27 Series; non-hold open (NHO), Checkmate No. 1 holders, physically handicapped (PH), delayed action (DA), as scheduled; Rixson- Firemark, Inc. (RIX).
  4. Center Hung, Double Acting, Heavy Duty: 40 Series; with special machined fully concealed arm, non-hold open (NHO), physically handicapped (PH), delayed action (DA), as scheduled; Rixson- Firemark, Inc. (RIX).

## **2.11 STOPS AND HOLDERS**

- A. Angle Stops: Special angle stop, fabricated from brass or bronze, for single or pairs of doors without stops and having either a single continuous formed sponge silencer or a minimum of 2 rubber silencers per stop, minimum 1-1/2 inches wide x 3 inches long base for mortising into the head of door frame, minimum 3/4 inch maximum stop face projection; finish as scheduled.
1. AS18 Angle Stop; Ives (IVS).
  2. 489; Rockwood Manufacturing Company, Inc. (RM).
  3. 1801 Angle Stop; Architectural Builders Hardware Mfg., Inc. (ABH).
- B. Roller Latch Angle Stops: Special angle stop BHMA A156.16 Type E19111, fabricated from brass or bronze, for single doors without stops and having a minimum of 2 rubber silencers per stop, minimum 1-1/2 inches wide x 4-1/2 inches long base for mortising into the head of door frame, 9/16 inch maximum stop face projection, adjustable roller latch and ramp roller strike; finish as scheduled.
1. 4040 Adjustable Roller Latch; Door Controls International (DCI).
  2. RL1152; Ives (IVS).
  3. 593; Rockwood Manufacturing Company (RM).
  4. 1559BL; Trimco Hardware (TBM).

- C. Roller Latches: Special roller latch complying with BHMA A156.16 Type E19101, fabricated from brass or bronze, for single doors, minimum 1 inch wide x 3-3/8 inches long base for mortising into the head door frame, adjustable nylon covered roller latch and ramp roller strike; finish as scheduled.
1. 4030 Adjustable Roller Latch; Door Controls International (DCI).
  2. RL30; Ives (IVS).
  3. 590; Rockwood Manufacturing Company (RM).
  4. 1559WA; Trimco Hardware (TBM).
- D. Ball Type Latches: 4 way adjustable ball catch complying with BHMA A156.9 Type B13292, fabricated from brass or bronze, for single doors, with two adjustable stainless steel balls held under adjustable spring tension and hook strike.
1. CL21A; Ives (IVS).
- E. Concealed Overhead Door Holders: Heavy duty, concealed mounting, full mortised, bronze bodied, slide track design, with heavy shock absorber spring providing 5 to 7 degree compression before deadstop, non-metal slide and shock blocks, 110 degree maximum opening, complying with BHMA A156.8 Type C11511 for hold open and Type C11541 for stop function. Provide stop, or hold open, functions as scheduled.
1. 1000 Series; Architectural Builders Hardware Mfg., Inc. (ABH).
  2. 100 Series; Glynn-Johnson (GJ).
  3. Checkmate Heavy Duty 1 Series; Rixson-Firemark, Inc. (RIX).
- F. Exposed Overhead Door Holders: Heavy duty, surface mounted, bronze bodied, slide track design, with heavy shock absorber spring providing 5 to 7 degree compression before deadstop, non-metal slide and shock blocks, 110 degree maximum opening, complying with BHMA A156.8 Type C12511 for hold open and Type C12541 for stop function. Provide stop, or hold open, functions as scheduled.
1. 9000 Series; Architectural Builders Hardware Mfg., Inc. (ABH).
  2. 90 Series; Glynn-Johnson (GJ).
  3. Checkmate Heavy Duty 9 Series; Rixson-Firemark, Inc. (RIX).
- G. Floor Stops: Cast half dome design with rubber bumper, finish as scheduled. Provide manufacturer's standard riser heights as required for carpeted areas in conjunction with the floor bumpers scheduled. Unless otherwise scheduled, provide floor stops at each door leaf where partition construction does not allow the door to swing greater than 90 degrees.
1. For Thresholds, Carpet and/or Undercut Doors: Comply with BHMA 156.16 Type L12161, L02161 or L12141.
    - a. 3320X; Door Controls International (DCI).
    - b. FS438; Ives (IVS).
    - c. 1211; Trimco Hardware (TBM).
    - d. 443; Rockwood Manufacturing Company (RM).

2. For Doors with Standard 3/8 inch Clearance: Comply with BHMA 156.16 Type L12161, L02141 or L12141.
  - a. 3310X; Door Controls International (DCI).
  - b. FS436; Ives (IVS).
  - c. 1210; Trimco Hardware (TBM).
  - d. 441; Rockwood Manufacturing Company (RM).
  
3. For Acoustical Doors: A security type door stop, molded from black flame resistant resilient material wrapped around a heavy duty threaded steel stud for grouting into the floor substrates, approximately 1-1/2 inch tall x 2 inch diameter x 2-1/2 inch stud length.
  - a. FS18S; Ives.
  - b. 1209; Trimco Hardware (TBM).
  - c. 466; Rockwood Manufacturing Company (RM).
  - d. 269F; Hager Companies (HAG).
  
- H. Silencers for Wood Door Frames: BHMA A156.16, Type L03021; grey rubber. Provide 2 silencers for each pair of doors, 3 silencers for each single door.
  
- I. Silencers for Metal Door Frames: BHMA A156.16, Type L03011; grey rubber. Provide 2 silencers for each pair of doors, 3 silencers for each single door.
  
- J. Silencers for Aluminum Door Frames: Refer to Section **08 12 16 "INTERIOR ALUMINUM FRAMES."**
  
- K. Wall Stops: Cast disc type with concave rubber bumper, having an minimum of 2-1/8 inch diameter base with nominal 1 inch projection and concealed attachment to substrate. Unless otherwise scheduled, provide wall stops at each door leaf where partition construction does not allow the door to swing greater than 90 degrees.
  1. For Attachment to Masonry: Complying with BHMA A156.16, Type L12251 or L12101.
    - a. WS401CCV; Ives (IVS).
    - b. 1270CV; Trimco Hardware (TBM).
    - c. 404; Rockwood Manufacturing Company (RM).
  
  2. For Attachment to Gypsum Wallboard: Complying with BHMA A156.16, Type L12251 or L12101.
    - a. WS402CCV; Ives (IVS).
    - b. 1270WV; Trimco Hardware (TBM).
    - c. 403; Rockwood Manufacturing Company (RM).
  
  3. For Acoustical Doors: A security type door stop, molded from black flame resistant resilient material wrapped around a heavy duty threaded steel stud for grouting into the floor substrates, approximately 1-1/2 inch tall x 2 inch diameter x 2-1/2 inch stud length.

- a. FS18S; Ives.
  - b. 1209; Trimco Hardware (TBM).
  - c. 466; Rockwood Manufacturing Company (RM).
  - d. 269F; Hager Companies (HAG).
- L. Magnetic Catches: Aluminum bodied extra heavy duty magnetic catch with outside dimensions of approximately 13/16 x 3-1/8 x 1 inch complying with BHMA A156.9, Type B03161 fabricated with self aligning magnets and furnished complete with door strikes.
1. 327; Ives (IVS).
  2. 901; Rockwood Manufacturing Company (RM).
  3. CD45 Double Magnetic Cabinet Catch; Stanley Commercial Hardware (STH).

## **2.12 SLIDING DOOR HARDWARE**

1. Sliding Door Hardware: Provide complete sets consisting of continuous ball bearing hanger tracks, door hangers with provision for horizontal and vertical adjustments, floor guide, supports, track mounted stops, and rated for a door weight of 1000 pounds.
  - a. Dorma Agile 150.

## **2.13 MISCELLANEOUS DOOR HARDWARE**

- A. Boxed Power Supplies: Provide modular units complying with NEMA ICS 6, electrified for Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; and listed and labeled for use with fire alarm systems.
- B. Coat Hooks: Double coat hook, cast brass bodied, minimum 1-1/8 by 1-1/8 x 1-1/8 inch projection.
  1. 582 Double Coat Hook; Ives (IVS).
  2. Small Double Coat Hook No. 796; Rockwood Manufacturing Company (RM).
- C. Coat Hooks: Single coat hook, fabricated from brass or stainless steel, minimum 1 inch diameter x 3 inch projection.
  1. RM 804; Rockwood Manufacturing Company (RM).

## **2.14 FABRICATION**

- A. Manufacturer's Nameplate: Provide each door hardware item without exposed manufacturers labels, names, or designs.

- B. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips oval-head screws with finished heads to match surface of door hardware item being attached. Machine screws and expansion shields shall be used for attaching hardware to concrete and masonry. Use throughbolts for renovation work only where existing door blocking and reinforcements are unknown.
1. Concealed Fasteners: All new doors and door frames have been specified with adequate blocking and reinforcement provisions to eliminate exposed throughbolting of hardware items. Doors installed with exposed throughbolts will be rejected and replaced by the Contractor at no cost to the Owner. Where through bolts are used on existing doors provide sleeves for each through bolt.

## **2.15 FINISHES**

- A. Standard: Comply with BHMA A156.18.
- B. Appearance of Finished Work: Finishes of the same designation, that come from 2 or more sources, shall match when the items are viewed at arms length and approximately 24 inches apart. Unless otherwise scheduled, match each hardware item in a single hardware set with the scheduled latch or lock set finish. Painting of BHMA 600 (USP) surfaces is required and is specified under Division 09 Section 'Painting':
- C. Designations: The abbreviations used to schedule hardware finishes are generally BHMA (Federal Standards where indicated in parenthesis) designations. Comply with base material and finish requirements indicated by the following:
1. BHMA 600 (USP): Primed for painting.
  2. BHMA 605 (US3): Bright brass, clear coated.
  3. BHMA 606 (US4): Satin brass, clear coated.
  4. BHMA 611 (US9): Bright bronze, clear coated.
  5. BHMA 612 (US10): Satin bronze, clear coated.
  6. BHMA 613 (US10B): Dark-oxidized satin bronze, oil rubbed.
  7. BHMA 618 (US14): Bright nickel plated, clear coated.
  8. BHMA 619 (US15): Satin nickel plated, clear coated.
  9. BHMA 622:(US19): Flat black coated.
  10. BHMA 625 (US26): Bright chromium plated.
  11. BHMA 626 (US26D): Satin chromium plated.
  12. BHMA 628 (US28): Satin aluminum, clear anodized.
  13. BHMA 629 (US32): Bright stainless steel.
  14. BHMA 630 (US32D): Satin stainless steel.
  15. Alum.: Aluminum.



## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Hardware for fire door assemblies shall be installed in accordance with NFPA 80. Hardware for smoke and draft control door assemblies shall be installed in accordance with NFPA 105. Install hardware for non-labeled and non-smoke and draft door assemblies in accordance with BHMA A156.115 for steel doors and frames, BHMA A156.115-W series for wood doors, and hardware manufacturers installation instructions for doors and frames fabricated from other than steel or wood.
  - 1. All modifications to fire doors and frame for electric and mortised hardware shall be made by the respective door and frame manufacturers.
- B. Smoke Seals at S Labeled Door Assemblies: Provide and install smoke seals at S labeled doors in accordance with door manufacturer's instructions.

### **3.2 INSTALLATION**

- A. Mounting Heights: Mount door hardware units at the following heights, unless specifically indicated on the drawings or required to comply with governing regulations:
  - 1. Locks and Latches: 38 inches to center of lever from finish floor.
  - 2. Door Pulls: 44 inches from finish floor to center of grip. Pull bases centered on door stiles, unless otherwise indicated.
  - 3. Door Pulls: Pull bases centered on top and bottom door rails, and spaced from lock edge of door stile as indicated, or recommended, by the pull manufacturer.
  - 4. Push Plates: 44 inches from finish floor to center of plate. Coordinate with pull location.
  - 5. Horizontal Push/Pull Bar: 42 inches from finish floor to center of pull/pull. Push/Pull bases centered on door stiles, unless otherwise indicated.
  - 6. Butt Hinges: 10 inches to bottom of lowest hinge from finish floor; 5 inches to top of upper hinge from top of door; space intermediate hinges equally between lower and upper hinges.
  - 7. Deadbolts: Not more than 44 inches from finish floor to operating trim.
  - 8. Flush Bolt Operating Mechanisms: Top bolt 66 to 72 inches from finish floor, bottom bolt 12 inches from finish floor.
  - 9. Exit Devices: 40 inches from finish floor to center of touch bar. 38 inches from finish floor to center of cross bar.
  - 10. Coat Hooks: 48 inches from finish floor to center of coat hook.

- B. Install each door hardware item to comply with manufacturer's written instructions. Install overhead surface closers for maximum degree of opening obtainable. Place on room side of corridor doors, stair side of stair doors, secondary corridor side of doors between corridors. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be finished, 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. All wall stops shall be installed with proper reinforced blocking in wallboard construction. Drywall anchors are not an acceptable means of reinforcement/blocking. Provide intermediate steel plates or channel reinforcement backing at wall stops mounted in wallboard construction.
- C. Do not install permanent key cylinders in locks until the time of preliminary acceptance by the Owner. At the time of preliminary acceptance, and in the presence of the Owner's representative, permanent key all lock cylinders. Record and file all keys in the key control system, and turn system over to Owner for sole possession and control.
- D. Key control storage system shall be installed where directed by the Owner.

### **3.3 ADJUSTING**

- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every hardware component. Replace hardware components that cannot be adjusted to operate as intended. Adjust door control devices to compensate for building stack pressures, final operation of forced air mechanical equipment and to comply with referenced accessibility requirements.
  - 1. Test each electrical hardware item to determine if devices are properly functioning. Wiring shall be tested for correct voltage, current carrying capacity, and proper grounding. Stray voltages in wiring shall be eliminated.
  - 2. Coordinate with electrical installation for interface and connection with life safety and security systems.
- B. Fire-Rated Door Assembly Testing: Upon completion of the installation, test each fire door assembly in the project to confirm proper operation of its closing device and that it meets all criteria of a fire door assembly as per NFPA 80 2007 Edition. The inspection of the fire doors is to be performed by individuals with knowledge and understanding of the operational components of the type of door being subjected to testing and whom are either credentialed as an Architectural Hardware Consultant (AHC) or as a Fire Door Annual Inspector (FDAI). A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The record shall list each fire door assembly throughout the project, and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

**3.4 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation. Clean hardware components as necessary to restore proper finish. Provide protection during the progress of the work and maintain conditions that ensure door hardware is in perfect working order and without damage or deterioration at time of Substantial Completion.

**END OF SECTION 08 71 00**