

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Door hardware for swinging doors.
2. Door hardware for other doors to the extent indicated.
3. Cylinders for door hardware specified in other sections.

B. Related Sections:

1. Division 08 Section "Hollow Metal Doors and Frames".
2. Division 08 Section "Flush Wood Doors".
3. Division 08 Section "Access Doors and Frames" for access door hardware.
4. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
5. Division 28 Section "Access Control" for access control devices installed at door openings and provided as part of a security system.
6. Division 28 Section "Intrusion Detection" for detection devices installed at door openings and provided as part of an intrusion-detection system.
7. Division 28 Section "Fire-Alarm System" for connections to building fire-alarm system.

C. Electronic Finish Hardware

1. Furnish, deliver, and coordinate all mechanical and electronic finish hardware as indicated, specified and required. Include all hardware under this section that is not specified in other sections, whether or not such hardware is scheduled herein, and include all trim, attachments and fastenings specified or required for proper and complete installation for given application. Items of hardware (specifically, mounting accessories required by door or frame details and required to properly install hardware and have it function properly and in conjunction with specified interacting hardware) not definitely specified herein and necessary for completion of the work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to adjacent hardware. Where size and shape of member is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified.
2. Review electrified hardware with Owner's existing systems to ensure compatibility. Visit Owner's existing facilities as required.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
  1. Provide complete manufacturer's catalog cuts for each item scheduled.

- B. Shop Drawings: Details of electrified door hardware, indicating the following:
1. Wiring Diagrams: For power, signal, and control wiring and including the following:
    - a. Details of interface of electrified door hardware and building safety and security systems.
    - b. Schematic diagram of systems that interface with electrified door hardware.
    - c. Point-to-point wiring.
    - d. Risers.
    - e. Elevations of doors controlled by electrified door hardware.
  2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.
- C. Samples for Initial Selection: For plastic protective trim units in each finish, color, and texture required for each type of trim unit indicated.
- D. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
  2. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents, in vertical format (horizontal format will not be reviewed).
  3. Content: Include the following information:
    - a. Identification number, location, hand, fire rating, size, and material of each door and frame.
    - b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    - c. Complete designations, including name and manufacturer, type, style, function, size, swing, quantity, function, and finish of each door hardware product.
    - d. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
    - e. Fastenings and other pertinent information.
    - f. Explanation of abbreviations, symbols, and codes contained in schedule.
    - g. Mounting locations for door hardware.
    - h. List of related door devices specified in other Sections for each door and frame.
- E. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Architectural Hardware Consultant.
- B. Product Certificates: For electrified door hardware, from the manufacturer.
1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

- C. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
- D. Warranty: Special warranty specified in this Section.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Independent Architectural Hardware Consultant report of door hardware deficiencies.
- B. Manufacturer's data for each piece of hardware.
- C. Maintenance Data: For each type of door hardware to include in maintenance manuals.
- D. Installation instructions for each piece of hardware for each door.
- E. Bitting Lists for all keys.
- F. Complete set of wiring diagrams for each door with door number indicated.
- G. Final, as-built copy of hardware and keying schedule.
- H. Warranties.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
  - 1. Warehousing Facilities: In Project's vicinity.
  - 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
  - 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Independent Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:
  - 1. For door hardware, an Architectural Hardware Consultant (AHC) who is also an Electrified Hardware Consultant (EHC).
  - 2. The supplier and/or installer shall not act as the (AHC).
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer.
- D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

- E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
  - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.
- F. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- G. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- H. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
  - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
  - 2. Comply with the following maximum opening-force requirements:
    - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
    - b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
  - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
  - 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- I. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." In addition to Owner, Contractor, and Architect, conference participants shall also include Installer's Architectural Hardware Consultant and a representative of the Door Hardware Manufacturer. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
  - 1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
  - 2. Preliminary key system schematic diagram.
  - 3. Requirements for key control system.
  - 4. Requirements for access control.
  - 5. Address for delivery of keys.

#### 1.7 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site with suppliers, Independent Hardware Consultant, Owner's Representative and Manufacturer's Representative, in conjunction with preinstallation conference for wood and aluminum doors.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Confirm electrified hardware is compatible with Owner's existing access control systems and components and compatible with new systems to be installed by the Electrical Contractor.
  - 3. Inspect and discuss preparatory work performed by other trades.

4. Inspect and discuss electrical roughing-in for electrified door hardware.
5. Review sequence of operation for each type of electrified door hardware.
6. Review required testing, inspecting, and certifying procedures.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

#### 1.9 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with the Owner.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. 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.
- F. Phased Construction: Where lead times may compromise procurement of hardware required for initial phase(s) completion, submit hardware schedule for initial phase(s) in advance of the complete hardware submittal and obtain hardware for initial phases to not adversely affect the project schedule. The cost for multiple deliveries should be included in the bid.

#### 1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Structural failures including excessive deflection, cracking, or breakage.
    - b. Faulty operation of doors and door hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.

- a. Exit Devices: Five years from date of Substantial Completion.
- b. Manual Closers: 10 years from date of Substantial Completion.
- c. Concealed Floor Closers: 10 years from date of Substantial Completion.
- d. Locksets: 10 years from date of Substantial Completion.

#### 1.11 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Follow-Up Services: The hardware installer shall confirm, in writing, the operation of all door hardware is within tolerances prior to the General Contractor requesting Substantial Completion. In addition to warranty service required for issues realized post-occupancy during the warranty period, the installer shall re-review the operation of all door hardware ten months after Substantial Completion and shall make all adjustments required.

### PART 2 - PRODUCTS

#### 2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.
  1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
  2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
  1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
- C. Basis of Design: Hardware scheduled in Part 3 "Door Hardware Schedule" shall be considered the Basis of Design product. Acceptable manufacturers listed in this Part shall provide products that meet or exceed the published data of the Basis of Design product where their product is provided in lieu of the Basis of Design product.

#### 2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.

- b. IVES Hardware; an Allegion company.
- c. McKinney Products Company; an ASSA ABLOY Group company.
- d. Stanley Commercial Hardware; a dormakaba company.

### 2.3 CONTINUOUS HINGES

- A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch- thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.
- B. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.
    - b. IVES Hardware; an Allegion company.
    - c. McKinney Products Company; an ASSA ABLOY Group company.
    - d. Stanley Commercial Hardware; a dormakaba company.
    - e. Pemko; an ASSA ABLOY Group Company

### 2.4 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors.
- C. Lock Backset: 2-3/4 inches, unless otherwise indicated.
- D. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
- E. Mortise Locks: BHMA A156.13; Security Grade 1; stamped steel case with steel or brass parts; Series 1000.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Best; a dormakaba company.
    - b. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - c. Schlage Commercial Lock Division; an Allegion company.

### 2.5 AUXILIARY LOCKS

- A. Mortise Auxiliary Locks: BHMA A156.5; Grade 1; with strike that suits frame.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Best; a dormakaba company.

- b. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
- c. Schlage Commercial Lock Division; an Allegion company.

## 2.6 ELECTROMECHANICAL LOCKS

- A. Electromechanical Locks: BHMA A156.25; Grade 1; motor or solenoid driven; mortise latchbolt; with strike that suits frame.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Best; a dormakaba company.
    - b. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - c. Schlage Commercial Lock Division; an Allegion company.

## 2.7 SURFACE BOLTS

- A. Surface Bolts: BHMA A156.16.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Door Controls International, Inc.
    - b. IVES Hardware; an Allegion company.
    - c. Hager.
    - d. Baldwin.
    - e. Rockwood, an ASSA ABLOY Group company.
    - f. National Guard Products.

## 2.8 MANUAL FLUSH BOLTS

- A. Manual Flush Bolts: BHMA A156.16; minimum 3/4-inch throw; designed for mortising into door edge, furnished with dustproof strikes and mounting plates required to secure to finished floor.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Door Controls International, Inc.
    - b. IVES Hardware; an Allegion Company.
    - c. Hager.
    - d. Rockwood, an ASSA ABLOY Group company.
    - e. National Guard Products.

## 2.9 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - b. Stanley Commercial; a dormakaba company

- c. Von Duprin; an Allegion company.

## 2.10 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. SARGENT Manufacturing Company; an ASSA ABLOY Group company; Signature Series, removable core master key system.
  - B. High-Security Lock Cylinders: BHMA A156.30; Grade 1; Type M, mechanical; permanent cores that are removable; face finished to match lockset.
  - C. Construction Cores: Provide construction cores that are replaceable by permanent cores.

## 2.11 ACCESSORIES FOR PAIRS OF DOORS

- A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. IVES Hardware; an Allegion company.
    - b. Rockwood; an ASSA ABLOY Group company.
    - c. Hager.
    - d. National Guard Products.
- B. Astragals: BHMA A156.22.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.
    - b. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - c. Reese Enterprises, Inc.
    - d. National Guard Products.

## 2.12 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.

- b. DORMA Architectural Hardware; a dormakaba company.
- c. LCN Closers; an Allegion company.
- d. Norton Door Controls; an ASSA ABLOY Group company.
- e. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
- f. Stanley Commercial; a dormakaba company.

## 2.13 OVERHEAD STOPS AND HOLDERS

### A. Overhead Stops and Holders: BHMA A156.8.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Glynn-Johnson; an Allegion company.
  - b. Rockwood; an ASSA ABLOY Group company.
  - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
  - d. Rixon Specialty Door Controls; an ASSA ABLOY Group company.
  - e. National Guard Products.

## 2.14 DOOR SILENCERS

### A. Door Silencers: BHMA A 156.16; rubber door silencer.

1. Basis of Design: Subject to compliance with requirements, Door Silencers incorporated into the project shall be based on products as follows:
  - a. Rockwood Manufacturing Company, an ASSA ABLOY Group company; "608".
2. Acceptable Manufacturers: Subject to compliance with requirements, in lieu of the Basis of Design manufacturer, Contractor may provide products from the following manufacturers that meet or exceed the published data of the specified Basis of Design product.
  - a. IVES Hardware, an Allegion Company.
  - b. Hager Company.

## 2.15 DOOR GASKETING

### A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Hager Companies.
  - b. National Guard Products, Inc.
  - c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
  - d. Reese Enterprises, Inc.
  - e. Zero International; an Allegion brand.

2.16 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.
    - b. National Guard Products, Inc.
    - c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - d. Reese Enterprises, Inc.
    - e. Zero International; an Allegion brand

2.17 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. IVES Hardware; an Allegion company.
    - b. Hager Companies.
    - c. National Guard Products, Inc.
    - d. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - e. Reese Enterprises, Inc.
    - f. Zero International; an Allegion brand

2.18 AUXILIARY DOOR HARDWARE

- A. Auxiliary Hardware: BHMA A156.16.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.
    - b. Rockwood; an ASSA ABLOY Group company.
    - c. Stanley Commercial Hardware; a dormakaba company.
    - d. Allegion.

2.19 AUXILIARY ELECTRIFIED DOOR HARDWARE

- A. Auxiliary Electrified Door Hardware:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dorma; a dormakaba company.
    - b. Schlage Commercial Lock Division; an Allegion company.
    - c. Securitron Magnalock Corporation; an ASSA ABLOY Group company.

2.20 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  - 1. Existing System:
    - a. Grand master key locks to Owner's Sargent Signature Series existing system that shall match Owner's existing keyway.
- B. Keys: Brass.
  - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "DO NOT DUPLICATE."
  - 2. Quantity: In addition to one extra key blank for each lock, provide the following:
    - a. Cylinder Change Keys: Four.
    - b. Master Keys: Six.
    - c. Grand Master Keys: Six.
    - d. Control Keys: Two

2.21 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
  - 1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
  - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware or is indicated as a required use of through bolts. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt. Where through bolts are utilized, provide finish-threaded caps to fully conceal nuts.
    - a. Steel through bolts required at the following locations (no exceptions):
      - 1) Door closers at all locations.
  - 2. Fire-Rated Applications:

- a. Wood or Machine Screws: For the following:
  - 1) Hinges mortised to doors or frames
  - 2) Strike plates to frames.
3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
6. Self-drilling "Tek" type screws are not acceptable. Use only fasteners supplied by hardware manufacturer.
7. Where it is not possible to reinforce substrate adequately for screws, use through-bolts with sleeves or use sex bolts.
  - a. Do not use where head or nut would be exposed on face of door, unless specifically indicated or made necessary by other requirements.
  - b. Finish exposed heads and nuts the same as hardware on that side of the door.
8. Use expansion shield anchors in concrete and masonry.

## 2.22 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

- B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

### 3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Use manufacturers supplied installation templates.
  - 2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
  - 1. Replace construction cores with permanent cores as indicated in keying schedule.
- E. Closers:
  - 1. Install door closer mounting brackets, arms, plates, and miscellaneous equipment as necessary to mount all door closers inside room, or out of corridor at every instance where a door closer is specified. No door closers (nor parts, nor accessories of) shall be visible from corridor side unless Architect has authorized specific and formal approval for that mounting application, and has clear understanding closer is visible through lite, and has approved such.
  - 2. Install top jamb mounted units where hardware schedule lists closer functions that are not available in regular arm mounting configurations.
  - 3. Thru-bolt all closers to doors with sex bolts. Install aluminum spacers for all 5<sup>th</sup> and 6<sup>th</sup> bolts at arm connections to metal head frames, and notify frame suppliers to install reinforcing plates to receive all bolts including 5<sup>th</sup> and 6<sup>th</sup> bolts.
  - 4. Where any portion of the back of the closer is visible through glazing, a finish closure panel shall be installed.
- F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
  - 1. Configuration: Provide one power supply for each door opening with electrified door hardware.

- G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants." Provide Tampin expansion bolts at all thresholds.
- H. Stops: Provide wall stops for doors unless floor or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- I. Door Silencers: Furnish at all hollow metal and wood frames. Each door leaf shall be supplied with three (3) bumpers each side. Do not provide on doors with sound seals or on exterior doors.
- J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. All exterior doors shall be installed with a complete set of gasketing (including thresholds, sweeps, seals, astragals, and drips) whether specifically scheduled or not. Where gasketing provided shows evidence of being insufficient, new gaskets shall be provided at no additional cost
- K. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- L. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- M. Primed Hardware: Paint factory-primed hardware in accordance with Division 09 Section "Painting & Finishing."
- N. Electrified Hardware: Where electrified hardware is not compatible with existing and new access control systems, Contractor shall replace non-compatible components with compatible components at no cost to the Owner.
  - 1. Compatibility includes existing proximity devices used by the Owner.

### 3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
  - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Prior to Occupancy Adjustment: Adjust door closers to overcome air pressure produced by HVAC systems. If HVAC pressure, whether negative or positive, negates proper operation or function of any closing or latching device, or inhibits manufacturer's intended performance (in any manner), supplier shall inform the GC in writing that type of hardware cannot operate nor function as manufacturer has designed and tested due to HVAC condition.
- C. Post Occupancy Adjustment: Review operation of door hardware six to eight weeks after Substantial Completion in the presence of the Owner's Representative. Adjust hardware as required to ensure proper operation.
  - 1. Contractor will be required to re-visit site to adjust hardware omitted from onsite review.

3.5 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Contractor shall engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
  - 1. Independent Architectural Hardware Consultant shall inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.
  - 2. Prior to Substantial Completion, Contractor shall correct deficiencies noted in Independent Architectural Hardware Consultant report and re-engage Consultant to review corrected work.
  - 3. Where Project work occurs in phases, a report shall be prepared for each phase by this Consultant prior to Substantial Completion of each phase. A final complete report shall be furnished by the Consultant to confirm that all items for all phases have been corrected to comply with Project requirements.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.8 HARDWARE MANUFACTURER LEGEND

<u>Symbol</u>	<u>Manufacturer</u>
IL	Interlogix
MK	McKinney
PK	Pemko
RO	Rockwood
SA	Sargent
SC	Securitron

3.9 DOOR HARDWARE SCHEDULE

MARK 1

Doors 01/A, 02/A, 03/A, 04/A, 117/E  
 154/A, 161/B

AL DR X AL FR

PK	Hinges	XMC	AL
SA	Exit Device	8710 (both leafs)	US32D
SA	OH Closer	351 CPHS x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346C	AL
IL	Door Position Switch	1076D-G	--

Doors 150/A, 151/A, 157A/A, 157A/B,  
 160A/A, 161/A, 162/B, 163/A

MARK 2

AL DR X AL FR

PK	Hinges	XMC	AL
SA	Exit Device	10-16-55-56-63-8710 x 306AUX (active leaf)	US32D
SA	Cylinder	Signature Series 10-6300	US26D
SA	Exit Device	10-16-8710 (inactive leaf)	US32D
RO	Pull	BF158 (both leaves)	US32D
SA	OH Closer	351 CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346C	AL
SC	Power Transfer	EL-CEPT	--
MK	Frame Cable	QC-C1500	--
MK	Door Cable	QC-C300	--
IL	Door Position Switch	1076D-G	--
SC	Power Supply	AQD1	--

Electric Operation: Valid card electronically retracts latch bolt or key mechanically retracts latch bolt. Free egress at all times. In case of power loss, door remains locked. Furnish point-to-point wiring diagram and door schematic elevation.

Door 152A/A

MARK 3

WD DR X HM FR

MK	Hinges	TA2714	US26D
SA	Lockset	V54 x 8265 VN1J	US26D
OH	Closer	351 P10	EN
RO	Wallstop	406 x wall anchor	US26D
RO	Kickplate	K1050 x 8" x Dr. Width	US32D

Doors 152B/A, 152C/A

MARK 4

WD DR X HM FR

MK	Hinges	TA2714	US26D
SA	Lockset	10-63-8227 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
RO	Wallstop	406 x Wall anchor	US26D
RO	Kickplate	K1050 x 8" x Dr. Width	US32D

Doors 164A/A, 161A/B

MARK 5

HM DR X HM FR

PK	Continuous Hinge	XMC	AL
SA	Exit Device	10-16-63-8713 ETJ (active leaf)	US32D
SA	Cylinder	Signature Series 10-6300	US26D
SA	Exit Device	8710 (inactive leaf)	US32D
OH	Closer	351-CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346C	AL
PK	Astragal	305CN	AL
PK	Frame Seals	303CS	AL
RO	Kickplate	K1050 x 8" x Dr. Width	US32D
IL	Door Position Switch	1076D-G	--

DOOR HARDWARE

		MARK 6	
Door 114/B			HM DR X HM FR
PK	Hinges	XMBSP	AL
SA	Lockset	10-63-8237 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Stop	590H	BSP
RO	Surface Bolts	580 x TB (top & bottom inactive leaf)	US32D
RO	Kickplate	KB1151 x 36" high	US32D
PK	Threshold Plate	18/1BSP x Dr. Width	BSP
		MARK 7	
Door 165B/B			WD DR X HM FR
MK	Hinges	T4A3786	US26D
SA	Lockset	10-63 8205 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
RO	Wallstop	406 x wall anchor	US26D
		MARK 8	
Doors 200/C, 202/C			WD DR X HM FR
MK	Hinges	T4A3786	US26D
SA	Lockset	10-63-8237 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
RO	OH Stop	590 H	US26D
		MARK 9	
Doors M100/A, 171/B, 172/B			HM DR X HM FR
MK	Hinges	T4A3386 x NRP	US32D
SA	Exit Device	10-63-8913 LE1J	US32D
SA	Cylinder	Signature Series 10-6300	US32D
SA	OH Closer	351 CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346C	AL
PK	Frame Seals	303CS	AL
IL	Door Position Switch	1076D-G	--
		MARK 10	
Doors 150/B, 153/A, 155/A, 159/A, 162/C, 167/H, 167/J, 168/B			AL DR X AL FR
PK	Hinges	XMC	AL
SA	Exit Device	10-16-63 8710	US32D
SA	Cylinder	Signature Series 10-6300	US26D
RO	Pull	BF158 (both leafs)	US32D
SA	OH Closer	351 CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346C	AL
IL	Door Position Switch	1076D-G	--

		MARK 11	
Door 150/D			WD DR X HM FR
MK	Hinges	T4A3786 x NRP	US26D
SA	Lockset	10-63 8271 LE1J (active leaf)	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Closer	351 CPSH x TB	EN
RO	Manual Flush Bolts	556WS (top & bottom, inactive leaf)	US26D
RO	Kickplate	K1050 x 8" x Dr. Width	US32D
IL	Door Position Switch	1076D-G	--

Electronic Operation: Valid card electronically retracts latch bolt or key mechanically retracts latch bolt. In case of power loss, door remains locked. Furnish point-to-point wiring diagram and door schematic elevation.

		MARK 12	
Door 150/E			WD DR X HM FR
MK	Hinges	T4A3786 x NRP	US26D
SA	Lockset	10-63-8271 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Closer	351 CPSH x TB	EN
RO	Kickplate	K1050 x 8" x Dr. Width	US32D
IL	Door Position Switch	1076D-G	--

Electronic Operation: Valid card electronically retracts latch bolt or key mechanically retracts latch bolt. In case of power loss, door remains locked. Furnish point-to-point wiring diagram and door schematic elevation.

		MARK 13	
Door 150A/A			WD DR X HM FR
MK	Hinges	T4A3786	US26D
SA	Lockset	10-63-8237 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Closer	351 CPSH	EN

		MARK 14	
Doors 131/B, 132/B, 134/B, 135/B, 136/B, 137/B, 138/C, 139/B, 140/B, 141/B, 143/B, 144/B, 145/B, 215/B, 217/B 220/B, 222/B, 224/B, 219/B, 221/B, 223/B, 225/B, 226/B 227/B, 228/D, 230/B, 234/C			WD DR X HM FR
MK	Hinges	TA2714	US26D
SA	Lockset	10-63 8235 LE1J (active leaf)	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Stop	590 H	US26D
RO	Manual Flush Bolts	550 (top & bottom, inactive leaf)	US26D

DOOR HARDWARE

		MARK 15	
Doors 147/B, 161AC/A			HM DR X HM FR
PK	Continuous Hinge	XMC	AL
SA	Exit Device	LD-8910	US32D
SA	OH Closer	351 CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346 C	AL
PK	Frame Seals	303CS	AL
RO	Kickplate	K1050 x 8" x Dr. Width	AL
IL	Door Position Switch	1076D-G	--
		MARK 16	
Doors 155/B, 161/C			AL DR X AL FR
PK	Hinges	XMC	AL
SA	Deadbolt	10-63 8220 (active leaf, key corr. side)	US32D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Closer	351 CPSH x TB	EN
RO	Pull	BF158	US32D
RO	Manual Flush Bolts	556WS (top & bottom, inactive leaf)	US26D
PK	Threshold	2005AT	AL
PK	Drip Cap	346 C	AL
IL	Door Position Switch	1076D-G	--
		MARK 17	
Door 161AA/B			HM DR X HM FR
PK	Continuous Hinge	XMC	AL
SA	Lockset	10-63 8250 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Closer	351-CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346 C	AL
PK	Frame Seals	303CS	AL
RO	Kickplate	K1050 x 8" x Dr. Width	US32D
IL	Door Position	1076D-G	--
		MARK 18	
Doors 167/K, 160E/C, 243A/A			WD DR X HM FR
MK	Hinges	TA2714	US26D
SA	Lockset	10-63 8227 LE1J	US26D
SA	Cylinder	Signature Series 10-6300	US26D
SA	OH Stop	590 H	US26D
RO	Kickplate	K1050 x 8" x Dr. Width	US26D
		MARK 19	
Doors 169/B, 169/C			HM DR X HM FR
PK	Continuous Hinge	XMC	AL
SA	Exit Device	LD-8710	US32D
SA	OH Closer	351-CPSH x TB	EN
PK	Threshold	2005AT	AL
PK	Drip Cap	346C	AL
PK	Frame Seals	303CS	AL
RO	Kickplate	K1050 x 8" x Dr. Width	US32D
IL	Door Position Switch	1076D-G	--

