

SECTION 087100 - 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. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding doors.
 - 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Door Hardware Schedule".
 - 2. Division 08 Section "Hollow Metal Doors and Frames".
 - 3. Division 08 Section "Interior Aluminum Doors and Frames".
 - 4. Division 08 Section "Flush Wood Doors".
 - 5. Division 08 Section "Fiberglass Doors",
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 80 - Fire Doors and Windows.
 - 4. NFPA 101 - Life Safety Code.
 - 5. NFPA 105 - Installation of Smoke Door Assemblies.
 - 6. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C - Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Acceptable Manufacturers:
 - a. Stanley / Best Hardware (ST).
 - 2. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 3. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 4. 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 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.
 - g. Door and frame sizes and materials.
 - 5. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system

electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

- a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 2. Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.
 - D. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders. Cylinders shall be manufactured by Stanley / Best (ST) Access Systems, 7-pin, interchangeable core and keyed into an existing patented keyway.
 - E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
 - F. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.
- 1.4 QUALITY ASSURANCE
- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
 - B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders 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.
 - C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this

Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 3. NFPA 101: Comply with the following for means of egress doors:

- a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
- 4. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
 - a. Test Pressure: Positive pressure labeling.
- F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Address and requirements for delivery of keys and cut cores.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures

- I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. 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.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
 2. Faulty operation of the hardware.
 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
1. Ten years for extra heavy-duty cylindrical locks and latches.
 2. Five years for exit hardware.
 3. Twenty five years for manual surface door closers.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

- a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

- B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.

- 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:

- a. Two Hinges: For doors with heights up to 60 inches.
- b. Three Hinges: For doors with heights 61 to 90 inches.
- c. Four Hinges: For doors with heights 91 to 120 inches.
- d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

- 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

- a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
- b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.

- 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

- a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

- 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:

- a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal

of pin while door is closed; for the following applications:

- 1) Out-swinging exterior doors.
- 2) Out-swinging access controlled doors.
- 3) Out-swinging lockable doors.

5. Acceptable Manufacturers:

- a. Stanley / Best Hardware (ST).
- b. Hager Companies (HA).
- c. McKinney Products (MK).

2.3 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

a. Acceptable Manufacturers:

- 1) Trimco (TC).
- 2) Hiawatha, Inc. (HI).
- 3) Rockwood Manufacturing (RO).

2.4 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

1. Acceptable Manufacturers:

- a. Stanley / Best Hardware (ST).

- C. Cylinders: Original manufacturer cylinders complying with the following:
1. Cylindrical Type: Threaded cylinders with rings and straight- or clover-type cam.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Cylindrical and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- D. Keyway: Cylinders shall be manufactured by Stanley / Best Access Systems, 7-pin, interchangeable core and keyed into an existing patented keyway.
- E. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- F. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
1. Existing System: Master key or grand master key locks to Owner's existing Stanley / Best (ST) patented keyway system.
- G. Key Quantity: Provide the following minimum number of keys:
1. Permanent Control Keys (where required): Two (2).

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Extra Heavy-Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 certified cylindrical locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
1. Acceptable Manufacturer:
 - a. Stanley / Best (ST) - 9000 Series.

- B. Narrow Stile Interconnected Locksets: Interconnected locksets designed with a mortise case which contains both a latchbolt and deadbolt and allows simultaneous retraction of both the latchbolt and deadbolt with a single motion turning of the lever handle. Locksets to be non-handed and available with a 1 1/8" or 1 1/2" standard backset. Latchbolt and deadbolt shall be fabricated of wrought brass and bronze with a minimum 3/4" latchbolt throw and 1" deadbolt throw.

1. Acceptable Manufacturers:

- a. Adams Rite (AD) - 2190/2290 Series.

- C. Lock Trim Design: As specified in Hardware Sets.

2.6 LOCK AND LATCH STRIKES

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

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

- B. Standards: Comply with the following:

1. Strikes for Cylindrical Locks and Latches: BHMA A156.2.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
4. Dustproof Strikes: BHMA A156.16.

2.7 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult

manufacturer's catalog and template book for specific requirements.

- a. Fire Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions to be used only with exit devices for which they have been tested.
3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
4. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.
 - b. Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.
6. Vertical Rod Exit Devices: Provide and install interior surface and concealed vertical rod exit devices as Less Bottom Rod (LBR) unless otherwise indicated.
7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in

the functions specified in the Hardware Sets. Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness. Painted or aluminum metal rails are not acceptable. Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.

1. Acceptable Manufacturers:

- a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
- b. Sargent Manufacturing (SA) - 80 Series.
- c. Von Duprin (VD) - 35A/98 XP Series.
- d. Yale Locks and Hardware (YA) - 7000 Series

2.8 ELECTROMECHANICAL CONVENTIONAL EXIT DEVICES

- A. Electrified Conventional Push Rail Devices (Heavy Duty): Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified below.

1. Acceptable Manufacturers:

- a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
- b. Sargent Manufacturing (SA) - 80 Series.
- c. Stanley Precision (PR) - Apex 2000 Series.
- d. Von Duprin (VD) - 35A/98/99 Series.
- e. Yale Locks and Hardware (YA) - 7000 Series.

- B. Electrified Options: As indicated in hardware sets, provide electrified exit device options including: electric latch retraction , electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling. Unless otherwise indicated, provide electrified exit devices standard as fail secure.

2.9 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:

- 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
- 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 10 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.
- B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC6000 Series.
 - b. LCN Closers (LC) - 1460FC Series.
 - c. Norton Door Controls (NO) - 8500 Series.
 - d. Sargent Manufacturing (SA) - 1431 Series.
 - e. Stanley / Best Hardware (ST) - CLD-4551 Series.
 - f. Yale Locks and Hardware (YA) - 3500 Series.

2.10 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following.
 - a. Stainless Steel: .050-inch thick, with countersunk screw holes (CSK).
 - b. Brass or Bronze: .050-inch thick, with countersunk screw holes (CSK).
 - c. Laminate Plastic or Acrylic: 1/8-inch thick, with countersunk screw holes (CSK).
4. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.
5. Metal Door Edging: Door protection edging fabricated from a minimum .050-inch thick metal sheet, formed into an angle or "U" cap shapes, surface or mortised mounted onto edge of door. Provide appropriate leg overlap to account for protection plates as required. Height to be as specified in the Hardware Sets.
6. Acceptable Manufacturers:
 - a. Trimco (TC).
 - b. Hiawatha, Inc. (HI).
 - c. Rockwood Manufacturing (RO).

2.11 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Acceptable Manufacturers:

- a. Trimco (TC).
- b. Hiawatha, Inc. (HI).
- c. Rockwood Manufacturing (RO)

2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
 1. Pemko Manufacturing (PE).
 2. Reese Enterprises, Inc. (RS).
 3. Zero International (ZE).

2.13 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal

screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and 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 work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 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.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. Manufacturer's Abbreviations:

- 1. ST - Stanley / Best
- 2. MK - McKinney
- 3. MR - Markar
- 4. RO - Rockwood
- 5. YA - Yale
- 6. SA - Sargent
- 7. AT - Accurate Lock and Hardware
- 8. HS - HES
- 9. SU - Securitron
- 10. RF - Rixson
- 11. PE - Pemko
- 12. OT - By Others
- 13. 00 - Other

Hardware Schedule

Set: 1.0

~~Doors: B14/F~~

~~-~~

6 Hinge (A8111)	FBB168	US26D	ST
2 Flush Bolt (L04251)	555	US26D	RO
1 Dust Proof Strike (L04021)	570	US26D	RO
1 Storeroom Lock (F86)	9K3-7D14C S3 Cormax - Keyed To Existing System	626AM	BE
2 Surface Closer (C02021)	D-3551 EDA	689	SD
2 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
2 Door Stop (L02141)	441	US26D	RO
3 Silencer (L03011)	608		RO

Set: 2.0

Doors: 221/A, 250/A, C9/A, C3/A

6 Hinge (A8111)	FBB168	US26D	ST
2 Exit Device (Type 2, F01)	2208 x 4908A LBR	630AM	PR
2 Rim Cylinder	12E72 Cormax - Keyed To Existing System	626	BE
2 Surface Closer (C02021)	D-3551 EDA	689	SD
2 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
2 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
2 Silencer (L03011)	608		RO

Set: 3.0

Doors: 226/A

1 Continuous Hinge (A51031B)	651 HT	630	ST
1 Entry/Office Lock (F109)	9K3-7AB14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Surface Closer (C02211)	D-3551 T	689	SD
1 Door Stop (L02141)	441	US26D	RO

Notes: WEATHERSTRIP IS BY DOOR MANUFACTURER.

Set: 5.0

Doors: 217/B, 220/A, 222/A, 251/A, 256/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Storeroom Lock (F86)	9K3-7D14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 6.0

Doors: 100A/A, 204/A, 234/A, ~~B14/C~~

3 Hinge (A8112)	FBB179	US26D	ST
1 Storeroom Lock (F86)	9K3-7D14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Surface Closer w/Stop (C02021 PT 4G)	D-3551 CS	689	SD
1 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 7.0

Doors: 101/A, 203/A, 209/A, 210/A, 211/A, 213/A, 214/A, 217/A, 218/A, 219/A,
223/A, 230/A, 231/B, 240/A, 243/A, 245/A, 246/A, 247/A, 249/A, 252/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Entry/Office Lock (F109)	9K3-7AB14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 8.0

~~Doors: B13/A~~

~~—~~

3 Hinge (A8112)	FBB179	US26D	ST
1 Entry/Office Lock (F109)	9K3-7AB14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Surface Closer (C02021)	D-3551-EDA	689	SD
1 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 9.0

Doors: 205/A, 216/A, 242/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Passage Lock (F75)	9K3-0N14C S3	626AM	BE
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 10.0

Doors: 224/A, 229/A, 232/A, 238/A, 255/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Classroom Lock (F84)	9K3-7R14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 11.0

Doors: 202/A, 206/A, 254/A, C4/A, C8/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Classroom Lock (F84)	9K3-7R14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Surface Closer (PT 4C-C02011 / C02021)	D-3551	689	SD
1 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO

3 Silencer (L03011)	608		RO
---------------------	-----	--	----

Set: 12.0

Doors: 231/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Classroom Lock (F84)	9K3-7R14C S3 Cormax - Keyed To Existing System	626AM	BE
1 Surface Closer w/Stop (C02021 PT 4G)	D-3551 CS	689	SD
1 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 13.0

Doors: 208/A, 215/A

3 Hinge (A8112)	FBB179	US26D	ST
1 Privacy Lock(F76)	9K3-0L14C S3	626AM	BE
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 14.0

Doors: 227/A, 228/A, 235/A, 236/A

3 Hinge (A8111)	FBB168	US26D	ST
1 Push Plate (J301)	70F	US32D-MS	RO
1 Pull Plate (J405)	111x70C	US32D-MS	RO
1 Surface Closer (PT 4C- C02011 / C02021)	D-3551	689	SD
1 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
1 Wall Stop-Convex (L02101-Cast)	400	US26D	RO
3 Silencer (L03011)	608		RO

Set: 15.0

~~Doors: B14/E~~

~~—~~

~~1 Hardware~~

~~—~~

~~By Others~~

~~00~~

~~Set: 16.0~~

~~Doors: B14/B, B14/H~~

2	Continuous Hinge (A51331B)	651 HT EPT	630	ST
1	Exit Device (concealed vertical rod, exit only)	ELR C 2601	630AM	PR
1	Exit Device (concealed vertical rod, nightlatch)	ELR C 2603 NCA 03	630AM	PR
1	Rim Cylinder	12E72 Cormax Keyed To Existing System	626	BE
2	Door Pull	BF158	US32D-316	RO
2	Cone. OH Stop Adj (C01541)	1-X36 Adjustable	630	RF
2	Operator Switch	685D		NO
2	Automatic Operator	5910 / 5930 (as required)	689	NO
1	Threshold (J32200)	1715AK MSES25SS		PE
2	Door Bottom Seal (R0Y416)	315-CN		PE
1	Card Reader	By security supplier	BLK	HD
1	Power Transfer	EPT 12C		PR
1	Wire Harness	WH 6E		BE
1	Wire Harness	WH 192P		BE
1	Wire Harness	WH XXP Length As Req'd		BE
1	Exit Device Power Controller	ELR152		PR

~~Notes: WEATHERSTRIP IS BY DOOR MANUFACTURER.
CARD READER BY OTHERS. PRESENTING AUTHORIZED CREDENTIAL TO CARD READER WILL
UNLOCK EXIT DEVICE AND ACTIVATE OPERATOR ALLOWING ACCESS. PUSHING INTERIOR
DOOR SWITCH WILL UNLOCK EXIT DEVICE AND ACTIVATE OPERATOR ALLOWING EGRESS.
EGRESS IS BY EXIT DEVICE. EMERGENCY ACCESS BY KEY.~~

~~Set: 17.0~~

~~Doors: B14/G, B14/A~~

2	Continuous Hinge (A51031B)	651 HT	630	ST
2	Push Bar & Pull	BF15847	US32D-316	RO
2	Operator Switch	685D		NO
2	Automatic Operator	5910 / 5930 (as required)	689	NO

~~Notes: WEATHERSTRIP IS BY DOOR MANUFACTURER.
PUSHING EITHER PUSH BUTTON WILL ACTIVATE OPERATOR.~~

~~Set: 18.0~~

~~Doors: B14/D~~

~~-~~

1 Continuous Hinge (A51031B)	651 HT	630	ST
1 Exit Device (Type 1, F08)	2108 x 4908A	630AM	PR
1 Rim Cylinder	12E72 Cormax Keyed To Existing System	626	BE
1 Surface Closer w/Stop (C02021 PT 4C)	D-3551 CS	689	SD
1 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO
1 Threshold (J32130)	171A MESS25SS		PE
1 Gasketing (R3E164)	303AS (head & jams)		PE
1 Door Bottom Seal (R0Y406)	234 AV		PE

Set: 19.0

Doors: 102A/A

6 Hinge (A8112)	FBB179	US26D	ST
2 Flush Bolt (L04251)	555	US26D	RO
1 Dust Proof Strike (L04021)	570	US26D	RO
1 Storeroom Lock (F86)	9K3-7D14C S3 Cormax Keyed To Existing System	626AM	BE
2 Surface OH Stop (C02541)	9-X36	630	RF
2 Kick Plate (J102)	K1050 10" 4BE CSK	US32D	RO

END OF SECTION