

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Hardware for non-rated doors.
 - 2. Hardware for fire-rated doors.
 - 3. Weatherstripping, seals and door gaskets.
 - 4. Cylinders for[coiling counter doors][and[elevator] locks and keyed switches
- B. Related Sections
 - 1. Section 08 12 13 - Hollow Metal Frames.
 - 2. [Section 08 13 13 - Hollow Metal Doors.]
 - 3. [Section 08 14 00 - Flush Wood Doors.]
 - 4. [Section 08 17 00 - Integrated Door Assemblies.]

1.02 REFERENCE STANDARDS

- A. American National Standards Institute:
 - 1. ANSI A156.18 - Materials and Finishes.
- B. CBC - California Building Code.
- C. California Department of General Services - Division of the State Architect -Access Policies:
 - 1. Policy 99-08 - Door Stops and other Floor-Mounted Obstructions.
- D. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.
- E. [National Fire Protection Association:]
 - 1. [NFPA 80 - Fire Doors and Windows.]
 - 2. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
 - 3. [NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.]
- F. Underwriters Laboratories Inc.:
 - 1. UL - Building Materials Directory.

1.03 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
 - 1. Intent is provision of all required items of door hardware.
 - 2. [All doors which open into stairways, mechanical rooms, or other spaces where caution is required shall have levers with tactile markings to alert a visually impaired person of such conditions.]
 - 3. [As an extension to an existing system, no substitutions for locksets will be approved unless specifically invited.]
 - 4. Hardware shall be made to template.
- B. [Fire-Rated Openings:]
 - 1. Provide door hardware with UL or WH listing for type of application involved.]

2. Hardware: Tested in accordance with NFPA 252.
 3. Any specified hardware for such openings not in compliance therewith shall be referred to University's Representative.
 4. [Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.]
- C. All hardware shall meet requirements of CBC Sections 1010.1.10 and 11B-404.2.7.
- D. Closers shall have following maximum pressure for opening doors.
1. Interior Door: 5 pounds pressure.
 2. Exterior Doors: 5 pounds pressure.
 3. Fire Doors: 5 pounds pressure maximum or maximum effort to operate door may be increased to maximum allowable by appropriate administration authority, not to exceed 15 pounds per CBC Section 1133B.2.5.
- E. Exit Devices:
1. Exit devices shall comply with CBC Section 1008.1.9.
 2. Unlatching force shall not exceed 15 pounds applied in direction of travel.
- F. Thresholds shall comply with CBC Section 1133B.2.4.1.
- G. [Electronic Hardware:]
1. Electronic hardware products contained within the section represent part of a complete engineered system. If alternate electronic products are submitted, it is Contractor's responsibility to provide a complete and working system at no additional cost to University. This requirement includes re-engineering of electrical diagrams and system layout, as well as power supplies, power transfers and electrical components.
 2. Hardware requiring electrical connection is to listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
1. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.
 2. Coordinate door hardware work with other directly affected sections involving manufacturer or fabrication of internal reinforcement for door hardware and recessed items.
 3. Provide necessary copies of templates or actual hardware as required ensuring proper preparation of doors and frames.
 4. Provide necessary copies of schedules and templates to necessary trade supplying materials to be prepped for door hardware in ample time to avoid fabrication and construction delays.
 5. Coordinate mounting heights with door and frame manufacturers.
 6. Coordinate reinforcing units provided by door and frame manufacturers with by hardware supplier and hardware manufacturer.
 7. Coordinate University's keying requirements during course of work.
 8. [Coordinate requirements for electrical devices and connections for hardware.]
 9. [Coordinate with other trades to ensure that line voltage and low voltage wiring is coordinated to provide complete and working system.]
- B. [Preinstallation Meeting:]
1. [Prior to installation of electronic hardware arrange a preinstallation meeting between Contractor, suppliers, and installers and related trades to review materials, procedures and coordinating related work.]

- C. [Sequencing:
 - 1. [Sequence installations to ensure utility connections are achieved in an orderly and expeditious manner.]
- D. [Scheduling:]

1.05 [SUSTAINABLE CHARACTERISTICS]

- A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design compliance.

- B. Materials and Resources Characteristics:

- 1. [Recycled Content Materials: Furnish materials with maximum available recycled content including:

SPEC NOTE *List materials specified in this section required to have recycled content.*

- a. [_____.]

- 2. [Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.]

SPEC NOTE *List materials specified in this section required to be regional materials.*

- a. [_____.]

1.06 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Product Data: For each door hardware item, furnish manufacturer's product information including parts list.
- C. Samples: Prior to preparation of hardware schedule:
 - 1. Submit two samples of hinge, latchset, lockset, closer, and smoke seal illustrating style, color, and finish.
 - 2. Samples will be returned to supplier.
- D. Door Hardware Schedule:
 - 1. Submit schedule at earliest possible date, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule.
 - 2. Reference each door using Door Number and hardware group used in the Contract Documents.
 - 3. Door hardware schedule to include detailed list of each hardware item, quantity, manufacture, and model number, function, size as applicable, hardware finish, and fastenings.
 - 4. Door hardware schedule to include door handing and degree of opening, door and frame sizes and materials, and other pertinent information.
 - 5. Door hardware schedule to include explanation of all abbreviations, symbols, codes, similar contained in schedule.
 - 6. [Door hardware schedule to include electrical characteristics and connection requirements.]
 - 7. Mounting locations for hardware.
 - 8. Include with schedule product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.
 - 9. [Note in cover letter variations from specified hardware and hardware groups stating changes and reasons for changes. University's Representative will review only those items which are referenced in cover letter.]

- E. Templates: Furnish hardware templates to each fabricator of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work to confirm that adequate provisions are made for proper location and installation of hardware.
- F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- G. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- H. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- I. Keys: Deliver with identifying tags to University's Lock Shop by security shipment direct from hardware manufacturer.
- J. Operation and Maintenance Manual: Submit manual in accordance with the requirements specified in Section 01 78 00 Closeout Submittals. Manual to include the following
 - 1. Final hardware schedule, catalog cuts, and keying schedule.
 - 2. Hardware installation, adjustment, and lubrication instructions.
 - 3. Hardware inspection procedures related to preventative maintenance.
 - 4. [Wiring diagrams, elevation drawings, and operational descriptions for all electronic openings.]

1.07 [SUSTAINABLE DESIGN SUBMITTALS]

- A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 - 1. Materials Resources Certificates:
 - a. Certify source and origin for {salvaged} [and] [reused] products.
 - b. Certify recycled material content for recycled content products.
 - c. Certify source for regional materials and distance from Project site.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for the following products:
 - a. Salvage products.
 - b. Reused products/
 - c. Products with recycled material content.
 - d. Regional products.

1.08 MAINTENANCE PRODUCTS

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.
- C. Deliver materials to University's designated storage place, unload, and position in place per University's instructions.

- D. Provide University with a signed receipt indicating materials and quantities upon delivery

1.09 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with 3 years of documented experience.
- C. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

1.10 DELIVERY, STORAGE, AND PROTECTION

- A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Package hardware sets in containers clearly marked with appropriate hardware set number to match set numbers of reviewed hardware schedule. Two or more identical sets may be packed in same container.
- C. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.
 - 1. Comply with requirements in Section 01 60 00 - Product Requirements.

1.11 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in University's name and registered with manufacturer.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Manufacturers' catalog numbers are used herein to establish type, series, operation, and quality desired; substitutions of equal products will be permitted only where invited.
- B. Furnish each type of door hardware with accessories as required for applications indicated and for complete, finished, operational doors.
- C. Fastenings: Furnish fastenings of sufficient quantity, suitable size and type for heavy use and long life and as recommended by hardware manufacturer and as required to secure hardware. Following guidelines should be adhered to for fasteners and anchors:
 - 1. Finish: Exposed portions of fasteners and anchors shall match hardware item being fastened.
 - 2. Provide sex bolts, toggle bolts, or other anchors as recommended by hardware manufacturer according to material to which hardware is applied. Provide sex bolts for door closers attached to wood doors.
 - 3. Exposed Screw Heads: Phillips head type, unless otherwise indicated.

4. Use machine screws for hardware applied to metal.
5. Install hardware fastened to concrete or masonry with machine screws and “Star” type double expansion shields, or for screw sizes less than 1/4 inch, fasten with wood screws and Phillips “Red Head” Plastic Anchors, Fastway Extruded Vinyl Anchors, or “Star” Plastic Anchors, or equal. Do not use lead shields or tampins.

2.02 DOOR HARDWARE ITEMS

- A. Hinges:
 1. Hinges shall display following characteristics:
 - a. Entire length of hinge pin shall be circumferenced with a continuous machined surface on ball bearing hinges.
 - b. Swaging of the hinge shall not be in contact with hinge pin on a ball bearing hinge.
 - c. All hinges shall have five knuckles.
 - d. All ball bearings shall be completely concealed without the use of ferrules or sleeves.
 - e. All bearings and raceways shall be stainless steel.
 - f. Hinge size shall be in accordance with approved manufacturer’s published recommendations. Size shall be sufficient to clear trim projection.
 - g. [Exterior outswinging doors shall have non-removable pins.]
 2. Manufacturers: Hager Companies; Stanley Security Solutions, Inc.; McKinney Products Co.; or equal.
- B. [Pivot Manufacturers: Rixson; Ives; Bommer Industries Inc.; or equal.]
- C. Locksets and Latchsets:
 1. Cylindrical Locksets and Latchsets: Schlage’s “D Series, Sparta SPA Design”; match existing.
 2. Cylinders:
 - a. Cylinders shall have six pins.
 - b. Keyway to be Schlage’s “Quad VSRP Keyway” to match existing. University’s Lock shop to provide a letter of authorization to purchase restricted keyways.
 3. Strikes:
 - a. Provide wrought box strike for all locks, latches, and deadbolts.
 - b. Provide lip of strike with proper length for jamb detail and to protect trim from marring by latch bolt.
 - c. Strike to be curved unless otherwise indicated.
 - d. Coordinate strike requirements with lockset type and metal frames.
- D. Combination Locks:
 1. Schlage’s “AD-Series Electronic Lock AD 200CY 70 PRK SPA”; match existing.
- E. Modern Closers:
 1. Description: All modern closers shall display the following characteristics:
 - a. Hydraulically controlled full rack and pinion in operation with separate noncritical adjustable regulation for general closing speed, latching speed, backcheck control and spring power.
 - b. Adhere to manufacturer’s recommended schedule of sizes unless otherwise noted.
 2. Manufacturers: LCN Closers; Norton Door Controls; Sargent Manufacturing Co.; or equal.
- F. Exit Devices:
 1. Description:
 - a. Exit devices shall be manufactured of bronze or stainless steel, and plated or finished as specified. Moving parts made of die-cast “pot” or “white” metals are also not acceptable.
 - b. Levers used for exit devices shall be same as levers used for mortise locksets.
 - c. Use IC cylinders at all exit devices.

- 2. Manufacturers: Von Duprin, Inc.; or equal.
- G. [Push/Pull Manufacturers: Rockwood Mfg. Co.; Triangle Brass Manufacturing Co., Inc. (Trimco); or equal.]
- H. Stop/Holder:
 - 1. Description: All stops/holders shall display the following characteristics:
 - a. All stops and holders shall be solid or forged bronze; wrought is not acceptable.
 - b. All fasteners for wall-mounted stops shall be concealed.
 - c. All rubber bumpers shall be fastened by pin or screw that goes through rubber and seals into metal on opposite side. Rubber bumper that is screwed into metal holders is acceptable.
 - 2. Stop Manufacturers: Rockwood Mfg. Co.; Triangle Brass Manufacturing Co., Inc. (Trimco); Ives; or equal.
 - 3. [Overhead Holder Manufacturers: Rockwood Mfg. Co.; Glynn-Johnson Door Controls; Rixson; or equal.]
 - 4. [Magnetic Holder Manufacturers: Rixson; or equal.]
- I. [Bolt Manufacturers: Rockwood Mfg. Co.; Triangle Brass Manufacturing Co., Inc. (Trimco); Ives; or equal.]
- J. [Kick and Armor Plates Manufacturers: Rockwood Mfg. Co.; Triangle Brass Manufacturing Co., Inc. (Trimco); Ives; or equal.]
- K. [Threshold:]
 - 1. All thresholds must have a reinforcing center leg. Single length for each opening. Cut ends to match jamb profile.
 - 2. Manufacturers: Pemko Manufacturing Co.; Zero International Inc.; Reese Enterprises, Inc.; or equal.
- L. Weatherstripping Manufacturers: Pemko Manufacturing Co.; Zero International Inc.; Reese Enterprises, Inc.; or equal.
- M. [Miscellaneous Hardware Manufacturers: Rockwood Mfg. Co.; Triangle Brass Manufacturing Co., Inc. (Trimco); Ives; Door Controls International; or equal.]
- N. Mute (Silencer) Manufacturers: Rockwood Mfg. Co.; Triangle Brass Manufacturing Co., Inc. (Trimco); Ives; or equal.

2.03 FINISHES

- A. All hardware finishes shall conform to ANSI A156.18 product standards, materials, and finishes. Typical hardware finish shall be [626 (dull chrome)] unless otherwise noted. [Hardware exposed in toilet, bath, and shower rooms shall be polished chrome.]
- B. Spray paint door closers to match hardware finish.

2.04 KEYING

- A. Keying of Locksets:
 - 1. Equip locks with cylinders set up on one pins.
 - 2. University to do final keying.
 - 3. Key Material: Nickel Silver only.
 - 4. Supply two key blanks per cylinder.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine doors, door frames, and hardware for damage, defects, and suitability for intended use.
- B. Verify door and frames are ready to receive door hardware and dimensions are as indicated on shop drawings and as instructed by manufacturer.
- C. Verify that building is secured and free from weather elements prior to installing interior door hardware.
- D. [Verify electric power is available to power operated devices and is of correct characteristics.]
- E. Replace with good material any part or item found damaged, defective, or inadequate before installation.

3.02 STANDARDS FOR INSTALLATION

- A. Install door hardware in accordance with manufacturer's templates and instructions.
- B. [Install hardware for fire-rated openings in accordance with [CBC Section 715 and requirements for door manufacturer's fire rating listing.
- C. Install door hardware at heights indicated on the Drawings unless otherwise indicated.
 - 1. Mounting height of latching hardware shall be 30 to 44 inches above finished floor surface per CBC Section 1133B.2.5.2.
 - 2. Mount exit devices 36 to 44 inches above finished floor surface.
- D. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage, and reinstallation, or application of surface protections with finishing work specified in the Division 09 Sections.
- E. Floor stops shall not be located in path of travel and 4 inches maximum from walls[(Policy 99-08)].
- F. Screws shall be screwed, not driven into place.
- G. Do not install surface-mounted hardware until finishes have been completed on substrates involved.
- H. Fitting: Accurately and properly fit door hardware. Securely fasten fixed parts for smooth, trouble-free, nonbinding operation; fit faces of mortised parts snug and flush; operating parts shall move freely and smoothly without binding, sticking or excessive clearance.
- I. Ensure door hardware displays no evidence of finish paint after final building clean up with exception of prime-coated door hardware installed for finish painting. Contractor may achieve this by sequencing installation, removing after fitting and reinstalling after painting is completed, providing protection, cleaning to original hardware finish or other approved means.
- J. Latch and Bolt: Install latch and bolt to automatically engage in keeper, whether activated by closer or by manual push; in no case shall additional manual pressure be required to engage latch or bolt in keeper.
- K. Closers:

1. Adjust closer delay and operating speeds to comply with requirements of CBC Section 1133B.2.5 and Americans with Disabilities Act Architectural Guidelines, Article 4.13.10.
 2. Adjust sweep period of door closers so that from an open position of 70 degrees, door will take at least 3 seconds to move to a point 3 inches from that latch, measured to leading edge of door.
 3. Do not mount closers on corridor or vestibule side of door, except at exterior doors.
 4. Mount closers for 180 degrees swing wherever possible. Supply drop plates at narrow top rail doors.
 5. Carefully adjust closers to operate noiselessly and evenly.
 6. Have manufacturer's representative regulate closers prior to University's acceptance of building.
- L. Exit Devices: Contractor shall have authorized factory service technician inspect all exit devices after completion of installation to ensure proper adjustment and operation.
- M. Kick Plates/Armor Plates: Install on push side of doors unless otherwise noted.
- N. [Service technician shall submit a written report to University's Representative, Contractor, and hardware supplier upon completion of service inspection.]
- O. As required during progress of work, remove and reset doors and hardware for installation of work of other trades.
- P. After work has been otherwise completed, examine hardware in place for complete and proper installation.

3.03 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 19 - Inspection of Work.
- B. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation of function of every unit.
- B. Lubricate bearing surfaces of moving parts and adjust latching and holding devices for proper function; adjust door control devices for speed and power; test keys for proper conformance with keying system.
- C. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- D. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items as necessary. Restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.05 CLEANING

- A. Completely remove protective materials and devices and thoroughly clean exposed surfaces of hardware; check for surface damage prior to final cleaning for University's acceptance of Project.

3.06 PROTECTION OF INSTALLED WORK

- A. Protect installed Work under provisions of Section 01 76 00 - Protecting Installed Work.
- B. Protect door hardware from damage or marring of finish during construction; use strippable coatings, removable tapes or other approved means.
- C. Do not permit adjacent work to damage hardware or finish.

3.07 DEFECTIVE WORK

- A. Replace, rework or otherwise make good any hardware found defective as follows:
 - 1. Unauthorized substitutes.
 - 2. Hardware broken, damaged, disfigured, or defaced
 - 3. Hardware delivered with missing, broken, damaged or defaced parts.
 - 4. Hardware of incorrect hand or function.
 - 5. Incomplete, misaligned, or incorrectly located hardware.

3.08 HARDWARE SCHEDULE

GROUP NO. 1 - Each [door]—~~or~~—[pair of doors]to have:

3	Hinges	Hager [], 4-1/2 by 4-1/2
1	Cylindrical Latchset	Schlage []
1	Cylindrical Lockset	Schlage []
1	Modern Closer	LCN []
1	Exit Device	Von Duprin []
1	Floor Dome Stop	Rockwood 442
1	Wall Stop	Rockwood 403
2	Automatic Flush Bolts	Rockwood
1	Coordinator	Rockwood 1600 Series with fillers and brackets
1	Gasket at Head and Jambs	Pemko S88D
3	Mutes	Rockwood 608

[Card Reader is specified with security equipment.]

[Acoustical gasketing specified in Section 08 14 00 - Wood Doors.]

[Acoustical gasketing specified in Section 08 34 73 - Sound Control Doors Assemblies.]

[Hinges and acoustical gasketing specified in Section 08 34 73 - Sound Control Door Assemblies.]

[Balance of hardware is specified in Section 08 17 13 - Integrated Steel Door Assemblies.]

[Automatic door operator is specified in Section 08 71 13 - Automatic Door Operators.]

[Power assist door operator is specified in Section 08 71 13 - Automatic Door Operators.]

GROUP NO. 2 - Each [door]—~~or~~—[pair of doors]to have:

3	Hinges	Hager [], 4-1/2 by 4-1/2
1	Cylindrical Lockset	Schlage []
1	Modern Closer	LCN []
1	Exit Device	Von Duprin []
1	Floor Dome Stop	Rockwood 442
1	Wall Stop	Rockwood 403
2	Automatic Flush Bolts	Rockwood
1	Coordinator	Rockwood 1600 Series with fillers and brackets
1	Gasket at Head and Jambs	Pemko S88D
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[Automatic door operator is specified in Section 08 71 13 - Automatic Door Operators.]

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END OF SECTION