

SECTION 08710
DOOR HARDWARE

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. The general provisions of the Contract, including General and Supplementary Conditions and Division 1 - General Requirements, apply to work specified in this Section.

1.02 SUMMARY

- A. Work included: Furnish and install hardware for all doors furnished under this Contract.
- B. Construction keying.
- C. Related Work Specified in other Sections:
 - 1. Door Schedule: On the Drawings.
 - 2. Steel Door and Frames: Section 08110

1.03 REFERENCE STANDARDS

- A. Standards:
 - 1. ANSI/BHMA A156.1-2000 Butts and Hinges
 - 2. ANSI/BHMA A156.2-1996 Bored and Pre-assembled Locks and Latches
 - 3. ANSI/BHMA A156.3-2001 Exit Devices
 - 4. ANSI/BHMA A156.4-2000 Door Controls – Closers
 - 5. ANSI/BHMA A156.5-2001 Auxiliary Locks and Associated Products
 - 6. ANSI/BHMA A156.6-2001 Architectural Door Trim
 - 7. ANSI/BHMA A156.7-2003 Template Hinge Dimensions
 - 8. ANSI/BHMA A156.8-2000 Door Controls - Overhead Holders and Holders
 - 9. ANSI/BHMA A156.15-2001 Closer/Holder/Release Devices
 - 10. ANSI/BHMA A156.18-2000 Materials and Finishes
 - 11. ANSI/DHI A115 Series (ANSI A115.1-1990 through ANSI A115.18-1994): Specifications for Steel Door and Frame Preparation for Hardware
 - 12. ANSI A117.1 – American National Standards Institute – Accessible and Usable Buildings and Facilities.
- B. NFPA – National Fire Protection Association:
 - 1. NFPA 80 – 1995 Standard for Fire Doors and Fire Windows
 - 2. NFPA 101 – 2000 Life Safety Code
- C. DHI – Door and Hardware Institute.
 - 1. Abbreviations and Symbols (1983)
 - 2. Keying Systems and Nomenclature (1989)
 - 3. Recommended Locations for Arch. Hardware for Standard Steel Doors and Frames. (2001)
 - 4. Recommended Procedures for Processing Hardware Schedules and Templates (1989)
 - 5. Sequence and Format for the Hardware Schedule (1993).
- D. ADA – The American Disabilities Act – Title III – Public Accommodations.

- E. WH – Warnock Hersey, “Certification Listing”

1.04 SUBMITTALS

- A. Product Data: Manufacturer’s illustrated product literature and specifications for each item of hardware.
- B. Hardware Schedule: Submit complete, properly itemized schedule of Builders Finish Hardware to be furnished under this Contract. Clearly refer to each item using manufacturer’s code letters and numbers. Use same set numbers used on door schedule on Drawings. Identify lockset functions. List the actual product series numbers.
- C. Samples: If requested, submit to the Architect for approval, a complete line of samples as directed. Samples shall be plainly marked giving hardware number used in this specification, the manufacturer’s numbers, types and sizes. The Architect will deliver approved samples to the project site to be stored. Samples will remain with the Architect until delivery of all hardware to the project is complete, after which time they will be turned over to the Contractor for incorporation into the work.
- D. Key Schedule: After a keying meeting between representatives of the Owner, Architect, and the Hardware Supplier, provide a keying schedule, listing the levels of keying, as well as an explanation of the key system’s function, the key symbols used, and the door numbers controlled. This schedule can be submitted as a part of the Hardware Schedule or as a separate schedule.
- E. Templates: Hardware supplier shall immediately, but not later than thirty (30) days after approval of his Schedule by the Architect, furnish the Contractor with complete template information necessary for the fabrication of doors and frames. No templates shall be furnished prior to the approval of the hardware schedule.
- F. Closeout Submittals:
 - 1. Installation and repair manuals for locksets, exit devices and closers.
 - 2. Extra materials for maintenance.

1.05 QUALITY ASSURANCE

- A. Hardware supplier shall have in his employ one or more members of the Door and Hardware Institute to include at least one Certified Architectural Hardware Consultant in good standing, who shall be responsible for preparation of the Finish Hardware Schedule. This Consultant shall be acceptable to the Architect and is to ensure that the intent requirement of this specification is fulfilled, and to certify that the work of this section meets or exceeds the requirements specified in this section and the requirements of authorities having jurisdiction.
- B. U.L. Listing: Whether specifically mentioned or not, equip fire-rated doors with UL approved hardware of corresponding rating and bearing the proper UL listing mark.
- C. Responsibility for Sizing Hardware: Hardware supplier shall determine conditions and materials of doors and frames for proper application of hardware. Follow manufacturers’ catalogue requirement for the actual size of door closers, brackets and holders. Door sizes are as noted on the Door Schedule and the hardware shall be in strict accordance with requirements of height, width, and thickness.

- D. All items of hardware are referenced by manufacturer's names and numbers. The manufacturer's names and numbers are used to define the function, design, and quality of the material to be supplied. Substitution of products other than those listed shall be in accordance with Section 01600, Product Requirements.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Clearly label each package to indicate the portion of the work for which it is intended.
- B. The hardware shipped to the jobsite is to be packaged in biodegradable packs such as paper or cardboard boxes and wrapping. If non-biodegradable packing such as plastic, plastic bags or large amounts of styrofoam is utilized, then the Contractor will be responsible for the disposal of the non-biodegradable packing to a licensed or authorized collector for recycling of the non-biodegradable packing.
- C. Require the Hardware Supplier to deliver hardware to the project site in accordance with the instructions of the Contractor.
- D. The Contractor shall furnish the Hardware Supplier with receipts for all hardware and accessory items received, and shall send copies of these receipts to the Architect, if requested.

1.07 WARRANTY

- A. Hardware supplier shall warrant and guarantee, in writing, that hardware supplied is free of defective material and workmanship. Supplier shall further warrant and guarantee for a period of one year from Owner's Use and Occupancy that the hardware shall function in a satisfactory manner without binding, collapse, or dislodging of its parts, provided the installation is made to the manufacturer's recommendations.

1.08 REGULATORY REQUIREMENTS

- A. Conform to all applicable codes. Provide throws, projections, coatings, knurling, opening and closing forces, and other special functions required by the State of Maine and Local Building Codes, and all applicable Access Code requirements, including ADA.
- B. For fire rated openings provide hardware complying with NFPA 80 and NFPA 101. Provide hardware tested by UL for the type and size of door installed and fire resistance rating required.

1.09 COORDINATION

- A. General Contractor shall furnish to hardware supplier a schedule of door and frame supplier(s) to review related work to insure hardware will be properly reinforced and applied in accordance with each manufacturers instructions.
- B. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.

1.10 MAINTENANCE MATERIALS AND TOOLS

- A. Provide adjusting tools and wrenches for the following operating products:
 - 1. Locksets (all types)

2. Exit Devices (all Types)
3. Door Closers

PART 2 --PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements, furnish products by the following manufacturers; furnish all hardware of each type from a single manufacturer.

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|-----|--|--|--|
| 1. | Hinges | McKinney
Hager
Bommer | Scranton, PA
St. Louis, MO
Landrum, SC |
| 2. | Locksets | Schlage | Colorado Springs, CO |
| 3. | Door Closers | LCN | Princeton, IL |
| 4. | Flush Bolts | Ives
Door Controls
Rockwood | New Haven, CT
Dexter, MI
Rockwood, PA |
| 5. | Door Stops | Quality
Ives
Rockwood
Hager | Brea, CA
New Haven, CT
Rockwood, PA
St. Louis, MO |
| 6. | Protective Plates | Rockwood
Burns
Quality | Rockwood, PA
Erie, PA
Brea, CA |
| 8. | Thresholds /
/Weatherstripping/
Rain Drips | NGP
Pemko
Reese | Memphis, TN
Memphis, TN
Rosemount, MN |
| 9. | Silencers | Ives
Rockwood | New Haven, CT
Rockwood, PA |
| 10. | Gasketing and
Astragals: | Door and Hardware Systems, Inc.
13 Silver Street, Rochester, New York 14611
Tel. No. 716-235-8543, Fax No. 716-235-0431. | |

2.02 MATERIALS AND QUALITY

- A. Hardware shall be of the best grade of solid metal entirely free from imperfections in manufacturer and finish.
- B. Qualities, weights, and sizes specified in this Section are the minimum that will be accepted. It is the responsibility of the Hardware Supplier to supply the specified size and weight of hardware and

the proper function of hardware in each case and to provide UL approved hardware at all fire-rated doors.

- C. Modifications to hardware that are necessary to conform to construction shown or specified shall be provided as required for the specified operation and functional features.
- D. Follow manufacturers' catalog requirements for the actual size of door closers, brackets and holders.
- E. Furnish screws, bolts, expansion shields, drop plates, and other devices necessary for the proper application of the hardware.
- F. Each Hardware Set listed in the schedule represents the hardware requirements for one opening (single door or pair of doors). Furnish the quantities required for each set for the work.

2.03 HARDWARE FOR LABELED FIRE DOORS, EXIT DEVICES AND SMOKE DOORS

- A. Hardware shall conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Labeling and listing by UL Building Materials Directory, for class of door being used will be accepted as evidence of conformance to these requirements. Install minimum latch throw as specified on label of individual doors. Provide hardware listed by UL except where heavier materials, larger sizes, or better grades are specified herein under paragraph entitled "Hardware Sets." In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements. Specific hardware requirements of door or frame manufacturers which exceed sizes or weights of hardware listed in this Section shall be provided with no additional charge.

2.04 FASTENERS

- A. Manufacture hardware to conform to published templates, generally prepared for machine screw installation.
- B. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Furnish exposed screws to match the hardware finish, or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible.
- C. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed fasteners. Do not use thru-bolts unless specifically approved by the Architect.
- D. Use only the fasteners supplied by manufacturers of specific products.
- E. Furnish the required screws, bolts and fastenings necessary for proper installation of each item of hardware, wrapped in the same package as the hardware item for which it is intended,

2.05 FINISH HARDWARE DESCRIPTION

- A. Butt Hinges: 5-knuckle regular weight ball-bearing steel hinges with steel non-rising pins with button tip and plug, 4.5" x 4.5", conforming to ANSI 5111. Provide removable pins unless NRP (non-removable pins) is indicated in schedule.

1. Provide two hinges for doors up to and including five feet in height, and an additional hinge for each two-and-one-half feet or fraction thereof, of the height of the door.
 2. Manufacturer and Products: One of the following:
 - a. McKinney TA2714
 - b. Hager BB1279
 - c. Bommer BB5000
- B. Door Closers:
1. Fully hydraulic, full rack and pinion action, with 1-1/2" in diameter cylinder body and double heat treated pinion 11/16" in diameter.
 2. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120°F to -30°F.
 3. Spring power shall be continuously adjustable in the field over the full range of closer sizes, from size 2 thru 6, and allow for reduced opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and hydraulic back-check.
 4. Arms: Solid forged steel main arms (and forged forearms for parallel arm closers).
 5. Closer arms (and metal covers when specified) shall have a powder coating finish.
 6. Provide drop, mounting plates where required.
 7. Locate closers on the pull (hinge) side of doors unless noted otherwise. Where it is necessary, due to certain conditions and with approval of the Architect, to install closers on the push side of the door, provide such closers with parallel arms.
 8. Adjust door closers in accordance with the manufacturer's templates and written instructions. Adjust back-check feature on closers with parallel arms prior to installation.
 9. Closers shall conform to applicable code requirements relative to setting closing speeds for closers and maximum pressure for operating interior and exterior doors.
 10. Manufacturer and Products: Furnish the following products (No Substitutions):
 - a. Exterior: LCN 4041S-CUSH
 - b. Interior: LCN 4011 for pull side; LC 4111 for push-side mounting.
- D. Automatic Coordinating: Provide at all pairs of label doors equipped with overlapping astragals or where improper closing sequence would interfere with proper operating of the doors. Coordinators shall be Ives "COR" series, Door Controls 600 series or Rockwood 1600 series. Furnish filler pieces to close opening between coordinator and jamb of frame. Provide mounting brackets as required for proper mounting of additional hardware.
- E. Flush Bolts: Self-latching or manual flush bolts as scheduled. Furnish dust proof strikes at all floor locations.
1. Manual Flush Bolts: Ives FB458, Door Controls 780 or Rockwood 555.

2. Self-Latching Flush Bolts: Ives FB51P, Door Controls 845, or Rockwood 1845.

F. Lock Sets, Latch sets: Cylindrical type shall be Schlage heavy-duty ANSI A156.2, Series 4000, Grade 1, 2-3/4" backset, interchangeable core cylinder, with lever handles. (no substitutions)

1. Manufacturer and Product: Schlage "Series D" with RHO lever.

2. Lock functions indicated in the hardware schedule shall be as follows:

<u>Function</u>	<u>Schlage Model No.</u>
A (Storeroom)	80TD
B (Classroom)	70TD
C (Passage)	10S

G. Latch Protector: Non-handed and incorporate security frame pin to prevent separation of the door and frame. Rockwood 321, Glynn Johnson LP12, or Ives No. 182.

H. Kick Plates: 8-inches high, 050 inch thick, beveled 4 edges, furnish with oval head counter-sunk screws for fastening; widths 2 in. less the width of door.

I. Stops: Furnish at all doors.

1. Wherever an opened door or any item of hardware mounted on the door strikes a wall at 90 degrees provide wall bumpers, unless otherwise indicated in hardware sets. Where wall bumpers cannot be effectively used, provide a floor stop. Where two doors interfere with each other in swinging, provide roller bumpers on each door.

2. Products:

<u>Manufacturer</u>	<u>Wall Bumpers</u>	<u>Floor Stops</u>	<u>Roller Bumpers</u>
Rockwood	409	440, 442	456
Ives	WS407CCV	FS436, FS438	RB470 Series
Quality	W302-TB	331, 431	
Hager	236W	243F	

3. Overhead Stops: Rixson 8-326xUS32D or approved equal by Hagar or Glynn Johnson.

J. Thresholds, Weather-Strips, Seals:

1. Thresholds: Extruded aluminum; Reese F-S281AV or equal by Pemko or NGP. Furnish thresholds at all exterior doors.

2. Weatherstripping Set: Furnish the following items on all exterior doors; furnish all weatherstripping components from a single manufacturer.

<u>Item</u>	<u>Pemko</u>	<u>Reese</u>	<u>NGP</u>
Brush Seal	45062CP	970C	A626A
Door Sweep	307A	806A	97A – Type B
Rain Drip	346C	R201A	16A

K. Silencers: Ives SR64/SR65 or Rockwood 608/609. Provide silencers on all door frames.

- L. Gasketing: #105 "Cush-N-Seal" as manufactured by Door and Hardware Systems, Inc.
- M. Astragal: #AST-SURF as manufactured by Door and Hardware Systems, Inc.

2.06. FINISHES

- A. Materials and finish:
 - 1. Interior Butts: US26D (BHMA 652)
 - 2. Door Closers: Sprayed to match hardware finish
 - 3. Kick Plates Push Plates, Door Pulls: US32D (BHMA 630)
 - 4. All other hardware: US26D (BHMA 626), or as scheduled.

2.07 KEYS AND KEYING

- A. The hardware supplier shall review the specific hardware functions with the Architect and Owner at the time of the keying review, to assure the appropriateness of each of the hardware functions. Failure to make this review does not relieve the hardware supplier from providing the proper functions.
- B. Key System: Locksets, cylinders shall be of the interchangeable core type and are to be furnished complete with temporary construction cores for use by the Contractor during the construction period. Permanent cores will be furnished and installed by the Owner, keyed to the existing system.
 - 1. Furnish 3 control keys for the removal of the construction cores and 5 construction keys. Return temporary construction cores to the Hardware Distributor.

PART 3 - EXECUTION

3.01. INSPECTION

- A. Inspect door openings and doors to determine that each door and door frame has been properly prepared for the required hardware. If errors in dimensions or preparation are encountered, they are to be corrected by the responsible parties prior to the installation of hardware.

3.02 PREPARATION

- A. Doors and frames requiring field preparation for finish hardware shall be carefully mortised, drilled for pilot holes, or tapped for machine screws for items of finish hardware in accordance with the manufacturers' templates and instructions.

3.03 INSTALLATION/ADJUSTMENT/LOCATION

- A. Install materials in a workmanlike manner following the manufacturer's recommended instructions.
- B. Install thresholds and weatherstripping set at all exterior doors. Set thresholds in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants".
- C. Install Exit Devices carefully to permit friction free operation of crossbar, touch bar, lever. Latching mechanism shall also operate freely without friction or binding.

- D. Install door closers in accordance with the manufacturer's instructions. Install each door closer carefully, at the degree of opening indicated on the hardware schedule. Arm position shall be as shown on the instruction sheets and required by the finish hardware schedule.
- E. Require the installer to adjust door closers at the time the door closer is installed. Adjust the closing speed and the latching speed valves individually, to provide a smooth, continuous closing action without slamming. Also adjust the delayed action feature or back check valve to permit the correct delayed action cycle or hydraulic back check cushioning of the door in the opening cycle. Properly adjust valves at the time of installation. Adjust the spring power for each door closer in accordance with the spring power adjustment chart illustrated in the door closer installation sheet packed with each door closer.
- F. Installation of all other hardware, including locksets, overhead holders, door stops, plates and other items, shall be carefully coordinated with the hardware schedule and the manufacturer's instruction sheets.
- G. Locations for finish hardware shall be in accordance with dimensions listed in the pamphlet "Recommended locations for Builders' Hardware for custom steel doors and frames" published by the Door and Hardware Institute, unless indicated differently by the Architect.

3.04 FIELD QUALITY CONTROL

- A. Upon completion of the installation of the finish hardware, required a representative of the finish hardware supplier to visit the project and examine the hardware for each door for which the hardware supplier has furnished hardware and verify that all hardware is in proper working order. Should items of hardware not operate properly, this representative shall make a report in writing to the Contractor, advising the Contractor of the problem and the measures required to correct the problem.

3.05 PROTECTION

- A. Carefully protect exposed surfaces of finish hardware, by use of cloth, adhesive backed paper or other materials, immediately after installation of the hardware item on the door. Leave protection in place until just prior to the inspection at the time of Substantial Completion; remove protection at that time.

3.06 CLEANING

- A. Clean finish hardware and remove remaining pieces of protective materials and labels.

3.07 HARDWARE SETS

Set No. 1 – Interior exit stair doors

Butts

1 – Lockset (Function C)

1 – Door Closer

1 – Kick Plate

3 – Silencers

Set No. 2 – Exterior exit stair door from roof

Butts

- 1 – Lockset (Function B) with knurled lever
- 1 – Door Closer
- 1 – Overhead stop
- 1 – Kick Plate
- 1 – Threshold
- 1 – Weather stripping set

Set No. 3 – Electrical Closets

Butts

- 1 – Lockset (Function A) with knurled lever
- 1 – Door Stop
- 1 – Door Closer
- 3 – Silencers

Set No. 4 – Tel/Data closets

Butts

- 1 – Lockset (Function A)
- 2 – Manual Flush Bolts (Note – not automatic despite rating)
- 1 – Dust Proof Strike
- 2 – Silencers

Set No. 5 – Shell space entrances

Butts

- 1 – Lockset (Function B)
- 1 – Door Stop
- 3 – Silencers

Set No. 6 – Biohazard Room

Butts

- 1 – Lockset (Function B) with knurled lever
- 1 – Door Stops
- 3 – Silencers

END OF SECTION 08710