

SECTION 08710  
FINISH 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 except as noted on the door schedule and/or drawings, including electrified hardware components required for security doors.

1. Furnish necessary and special screws, regular and special bolts, expansion shields, drop plates, and other devices necessary for the proper application of the hardware.
2. Provide hardware supplier with 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. Work by Owner:

1. Final keying.
2. Card readers, both on-line and off-line types.

- C. Related work in other Sections:

1. Door Schedule: Section 08000
2. Hardware for stair gate other than magnetic hold-open: Section 05500.
3. Hardware for millwork: Section 06400.
4. Steel Door and Frames: Section 08110
5. Wood Doors: Section 08210
6. Hardware for laboratory casework: Section 12320
7. Power wiring for electrical hardware: Division 16 – Electrical

1.03 REFERENCE STANDARDS

- A. Standards:

1. ANSI/BHMA A156.1 Butts and Hinges
2. ANSI/BHMA A156.2 Bored and Pre-assembled Locks and Latches
3. ANSI/BHMA A156.3 Exit Devices
4. ANSI/BHMA A156.4 Door Controls – Closers
5. ANSI/BHMA A156.5 Auxiliary Locks and Associated Products
6. ANSI/BHMA A156.6 Architectural Door Trim
7. ANSI/BHMA A156.7 Template Hinge Dimensions
8. ANSI/BHMA A156.8 Door Controls – Overhead Holders
9. ANSI/BHMA A156.15 Life Safety Closer/Holder/Release Devices
10. ANSI/BHMA A156.18 Materials and Finishes
11. ANSI A117.1 Accessible and Usable Buildings and Facilities.

- B. NFPA – National Fire Protection Association:
  1. NFPA 80 Standard for Fire Doors and Fire Windows
  2. NFPA 101 Life Safety Code
  3. NFPA 105 Installation of Smoke-Control Door Assemblies
- C. DHI – Door and Hardware Institute:
  1. "Recommended Locations"
  2. Abbreviations and symbols.
  3. Sequence and format for the hardware schedule.
  4. Recommended procedure for processing hardware schedules and templates.
  5. Keying systems and nomenclature.
- D. ADA – The American Disabilities Act – Title III – Public Accommodations.
- E. U.L. – Underwriters Laboratories.

#### 1.04 SUBMITTALS

- A. Product Data: Manufacturer’s illustrated product literature and specifications for each item of hardware.
- B. Hardware Schedule: Submit for review, within 21 days of award of contract, 6 copies of a complete, properly itemized schedule of Finish Hardware. 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. Samples shall be plainly marked giving hardware number used in this specification, the manufacturer's numbers, types and sizes. Approved samples will be returned to the Contractor for incorporation into the work.
- D. Keying Schedule: After a keying meeting between representatives of the Owner, Architect, and the Hardware Supplier, provide a keying schedule, listing the levels of keying, 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: Within ten days after approval of the Hardware Schedule by the Architect, furnish the Contractor with complete template information necessary for the fabrication of doors and frames. Do not furnish templates before the hardware schedule is approved.
- 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. 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.

#### 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. Package hardware 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 are used, then dispose of the non-biodegradable packing to a collector licensed to recycle the packing.
- C. Require the Hardware Supplier to deliver hardware to the project site in accordance with the instructions of the Contractor.
- D. Unless otherwise acceptable to the Owner, Contractor shall provide a locked storage area with adequate shelving exclusively for hardware.
- E. 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 applicable Access Code requirements, including ADA.

#### 1.09 COORDINATION

- A. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.

#### 1.10 MAINTENANCE MATERIALS AND TOOLS

- A. Extra materials: The following is a list of "Extra" stock that is to be furnished direct to the owner for future maintenance purposes:

	<u>Item</u>	<u>Quantity</u>
1.	Door Closers – Type 4011	2
2.	Door Closers – Type 4111	2
3.	Locksets – Function (D)	2
4.	Locksets – Function (G)	2
5.	Butts – Type TA2714 – 41/2 x 41/2	6

- B. 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. Where only one manufacturer is listed, new hardware has to match existing hardware in the building and substitutions will not be considered. Furnish all hardware of each type from a single manufacturer.

1.	Hinges	McKinney Hager Bommer	Scranton, PA St. Louis, MO Landrum, SC
2.	Locksets	Schlage	Colorado Springs, CO
3.	Exit Devices	Von Duprin	Indianapolis, IN
4.	Door Closers	LCN	Princeton, IL
5.	Flush Bolts	Ives Door Controls Rockwood	New Haven, CT Dexter, MI Rockwood, PA
6.	Magnetic Door Holders	Architectural Builders Hardware (ABH) LCN Rixson (ASSA Abloy)	Elk Grove Village, IL Princeton, IL Monroe, NC
7.	Door Stops	Ives Rockwood	New Haven, CT Rockwood, PA
8.	Protective Plates	Rockwood Burns	Rockwood, PA Erie, PA
9.	Silencers	Ives Rockwood	New Haven, CT Rockwood, PA

## 2.02 MATERIALS AND QUALITY

- A. All 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 manufacturer's catalog requirements for the actual size of door closers, brackets and holders.

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

- A. Hardware on labeled fire doors shall conform to requirements of NFPA 80; including minimum latch throw.
- B. Hardware on exit doors shall conform to requirements of NFPA 101.
- C. As evidence of conformance to these requirements, demonstrate one of the following:
  - 1. Hardware labeled and listed by U.L. for class of door being used.
  - 2. Test reports from a nationally recognized testing agency, showing that hardware has been tested in accordance with U.L. test methods and that it conforms to NFPA requirements.
- D. If necessary to meet these requirements, furnish hardware which exceeds sizes or weights of specified hardware at 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, except as otherwise indicated.
- 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. All hardware shall have the required screws, bolts and fastenings necessary for proper installation and shall be wrapped in the same package as the hardware item for which it is intended,

2.05 SCHEDULED HARDWARE

A. Hinges:

1. Number of hinges per door: 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. Interior Doors: Furnish steel hinges with oil-impregnated bearings, flush bearings and button tips, sized as follows:

<u>Door Thickness</u>	<u>Door Width</u>	<u>Hinge Weight</u>	<u>Hinge</u>
1-3/4"	40" and under	Regular	4-1/2"
1-3/4"	Over 40"	Extra heavy	5 x 4-1/2"

Width of hinge shall be determined by trim conditions

3. Products: Subject to selection of appropriate material and size, furnish one of the following:

<u>McKinney</u>	<u>Hager</u>	<u>Bommer</u>
T2714	1279	5000
TA2714	BB1279	BB5000
T4A3786	BB1168	BB5004

C. Door Closers: Hydraulic closers, with full rack and pinion action, 1-1/2" diameter cylinder body, and double heat treated pinion 11/16" in diameter. Closers shall have separate adjustment for latch speed, general speed, and hydraulic back-check. Provide metal covers on all surface-mounted closers.

1. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
2. Closers shall conform to applicable code requirements relative to setting closing speeds for closers and maximum operating pressure. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for accessibility. Hydraulic regulation shall be by tamper-proof, non-critical valves.
4. Arms: Solid forged steel main arms (and forged forearms for parallel arm closers).
5. Metal Finish: Powder coating on closer arms and on metal covers.
6. Provide drop, mounting plates where required.
7. Do not locate closers on the side of doors facing corridors, passageways or similar areas. Where it is necessary, due to certain conditions and approval of the Architect, to have closers in corridors, provide such closers with parallel or track type 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. Products: LCN 4011 and 4111, or equal by one of the other named manufacturers.

- D. Exit Devices: Von Duprin E9975L-F-NL x strike 575-2 (No substitutions), dummy trim matching the lock trim. Provide Electrification as listed in sets.
  - E. Electro-Magnetic Door Holders: Surface mounted wall magnetic units; 120 volt rating; ABH 2100 Series, LCH SEM 7850, or Rixson FM-998.
  - F. Coordinators: Ives COR series, Door Controls 600 series or Rockwood 1600 series.
    - 1. Furnish filler pieces to close opening between coordinator and jamb of frame.
    - 2. Provide mounting brackets as required for proper mounting of additional hardware.
  - G. Flush Bolts: Self-latching or manual type as scheduled. Furnish dust proof strikes at floor.
    - 1. Manual Bolts: Ives FB458, Door Controls 780 or Rockwood 555.
    - 2. Self-Latching Bolts: Ives FB61P, Door Controls 947, or Rockwood 1945.
  - H. Lock Sets, Latch Sets: Cylindrical 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; compatible with Best cores.
    - 2. Lock Functions: Per door hardware set schedule
    - 3. Cylinders: Best Access Systems; furnished and installed by Owner.
  - I. Kick Plates: 0.050 inch thick, beveled 4 edges, furnish with oval head counter-sunk screws for fastening; 8-inches high by width 2 in. less the width of door.
  - J. Stops: Furnish at all doors. Wherever an opened door or any item of hardware thereon strikes a wall, at 90 degrees, provide wall bumpers, unless otherwise indicated in hardware sets.
    - 1. Where wall bumpers cannot be effectively used, provide a floor stop.
    - 2. Provide roller bumpers for each door where two doors interfere with each other in swinging.
      - a. Wall Bumpers: Rockwood 409 or Ives WS407CCV.
      - b. Floor Stops: Rockwood 440 or 442 or Ives FS436, FS438.
      - c. Roller Bumpers: Rockwood 456 or Ives RB470 Series.
    - 3. Overhead Door Stops: Surface mounted type; Glynn Johnson GJ900S, Sargent 590S or ABH 9020.
  - K. Gasketing: #105 “Cush-N-Seal” as manufactured by Door and Hardware Systems, Inc. – 13 Silver Street – Rochester, New York 14611 – Tel. No. 716-235-8543 – Fax No. 716-235-0431.
  - L. Astragal: #AST-SURF as manufactured by Door and Hardware Systems, Inc. – 13 Silver Street – Rochester, New York 14611 – Tel. No. 716-235-8543 – Fax No. 716-235-0431.
  - M. Silencers: Ives SR64/SR65 or Rockwood 608/609. Provide silencers on all door frames.
- 2.06. FINISHES
- A. Materials and finish:
    - 1. Interior Butts: US26D (BHMA 652)
    - 2. Door Closers: Sprayed to match hardware finish

3. Exit Devices: US26D (BHMA 626)
4. Kick Plates: US32D (BHMA 630)
5. All other hardware: US26D (BHMA 626), or as scheduled.

## 2.07 KEYS AND KEYING

- A. Require the hardware supplier to review the specific hardware functions with the Owner 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: Lockset cylinders shall be of the interchangeable core type. Furnish 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. All doors and frames, requiring field preparation for finish hardware, shall be carefully mortised, drilled for pilot holes, or tapped for machine screws for all 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 exit devices carefully to permit friction free operation of crossbar, touch bar, lever. Latching mechanism shall also operate freely without friction or binding.
- C. 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.
- D. Require the hardware installer to adjust door closers at the time of installation of the door closer. Adjust the closing speed and the latching speed valves individually to provide a smooth, continuous closing action without slamming. 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.



1. Each door closer has adjustable spring power capable of being adjusted in the field, from size 2 thru 6. It shall be the installer's responsibility to adjust the spring power for each door closer in exact accordance with the spring power adjustment chart illustrated in the door closer installation sheet packed with each door closer.

E. Carefully coordinate installation of other hardware, including locksets, overhead holders, door stops, plates and other items, with the hardware schedule and the manufacturer's instruction sheets.

F. Locate finish hardware 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.

### 3.04 FIELD QUALITY CONTROL

A. Upon completion of the installation of the finish hardware, require a representative of the finish hardware supplier to visit the project and to examine the hardware for each door on which he or she has provided hardware, to verify that all hardware is in proper working order, and to report to the Contractor in writing, any problems observed, with a recommendation for the measures which should be taken to correct the problem.

B. Make adjustments and replace malfunctioning hardware as recommended.

### 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. The finish shall remain protected until completion of the project. Just prior to the inspection at the time of Substantial Completion, remove the protective material.

### 3.06 CLEANING

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

### 3.07 HARDWARE SETS

A. Each Hardware Set listed below represents the complete hardware requirements for one opening (single door or pair of doors). Furnish the quantities required for each set for the work.

Set Nos. 1, 2 – Not used.

Set No. 3

Hinges

1 – Lockset (Passage Function)

1 – Door Stop

1 – Door Closer (Reg. arm)

1 – Kick Plate

3 – Silencers

Set No. 4

Hinges

- 1 – Lockset (Storeroom Function)
- 1 – Overhead Door Stop
- 3 – Silencers
- 1 – Door Closer

Set No. 5

Hinges

- 1 – Lockset (Classroom Function)
- 2 – Manual Flush Bolts
- 1 – Dust Proof Strike
- 1 – Door Closer (Par. arm) – Active Leaf Only
- 2 – Silencers

Set No. 6 – Not used.

Set No. 7

Hinges

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

Set Nos. 8, 9, 10, 11 – Not Used.

Set No. 12

Hinges

- 1 – Latchset (Passage)
- 1 – Door Stop
- 1 – Door Closer (Reg. arm)
- 1 – Kick Plates
- 1 – Set Gasketing

Set Nos. 13 – 21 – Not Used.

Set No. 22

Hinges, Electrified hinges for active leaf

- 2 – Exit Device E9975L-F-NL x strike 575-2
- 1 - Power Supply Controller
- 1 – Card reader – power source by owner*
- 1 – Magnetic lock by owner*
- 1 – Set Self-Latching Flush Bolts
- 1 – Dust Proof Strike
- 1 – Door Coordinator
- 2 – Kick Plates
- 1 – Piece Astragal
- 2 – Door closers
- 2 – Wall stops
- 2 – Set Gasketing

Set No. 23

Hinges (one electrified hinge)

1 – Exit Device E9975L-F-NL x strike 575-2 (Electric unlock of trim)

1 - Power Supply Controller

*1 – Card reader – power source by owner*

*1 – Magnetic lock by owner*

1 – Door closers

1 – Kick Plates

1 – Wall stops

1 – Set Gasketing

Set No. 24 (gate)

Magnetic hold open.

*Hanging, closing and latching hardware by gate supplier, under Section 05500.*

END OF SECTION 08710