

SECTION 08710 - FINISH HARDWARE

PART 1--GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.02 DESCRIPTION OF WORK

- A. The work of this section includes, but is not limited to, the following:
 - 1. Providing hardware for all doors, except doors provided with their own hardware.
 - 2. Providing lock cylinders for all work requiring cylinders.
 - 3. Providing the services of a qualified hardware consultant to prepare detailed schedules of hardware required for the project.

1.03 RELATED WORK

- A. Carefully examine all of the Contract Documents for requirements which affect the work of this section. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
 - 1. Section 06410 - Custom Millwork; casework locks and hardware.
 - 2. Section 08100 - Steel Doors and Frames; work requiring template coordination, metal astragals for fire-rated doors.
 - 3. Section 08200 - Wood Doors; work requiring template coordination, metal astragals for fire-rated doors.
 - 4. Section 08305 - Access Doors; work requiring lock cylinders.
 - 5. Section 08410 - Aluminum Entrances and Storefronts; work requiring lock cylinders.

1.04 INTENT

- A. A major intent of the work of this section is to provide hardware for every door in the project, except as indicated, so that each door functions correctly for its intended use. Provide only hardware that complies with applicable codes and requirements of authorities having jurisdiction including requirements for barrier-free accessibility.

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. 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.
- C. The hardware supplier shall repair or remedy, without charge, any defect of workmanship or material for which he is responsible hereunder.

1.06 SUBMITTALS

- A. Submit the following in accordance with SECTION 01300-SUBMITTALS:
 - 1. Schedule: Submit to the Architect six (6) copies of the complete hardware schedule within fourteen (14) days after receipt of contract award. Submit therewith complete catalog cuts and descriptive data of all products specifically scheduled therein. No materials shall be ordered or templates issued until the hardware schedule has been approved by the Architect. Form and detail of hardware schedule shall be in vertical format in conformance to the door and hardware industry standards. All hardware sets shall be clearly cross-referenced to the hardware set numbers listed in this specification.
 - 2. 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 General Contractor for incorporation into the work.
 - 3. Keying System Submission: Before cylinders are ordered, submit a complete proposed keying system for approval. This should be done after a keying meeting has been held with the owners representative.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of hardware shall be made to the project by the Hardware Supplier in accordance with the instructions of the General Contractor.
- B. The finish hardware shall be delivered to the jobsite and received there by the General Contractor. The General Contractor shall prepare a locked storage room with adequate

shelving, for all hardware. The storage room shall be in a dry, secure area, and shall not include storage of other products by other trades.

- C. The General 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.

1.08 REGULATORY REQUIREMENTS

- A. Conform to all applicable codes. Provide all throws, projections, coatings, knurling, opening and closing forces, and other special functions required by State and Local Building Codes, and all applicable Handicap Code requirements.
- B. For fire rated openings provide hardware complying with NFPA 80 and NFPA 101 without exception. Provide only hardware tested by UL for the type and size of door installed and fire resistance rating required.

1.09 SPECIAL REQUIREMENTS

- A. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.
- B. The Hardware Schedule shall list the actual product series numbers. Bidders are required to follow manufacturers' catalog requirement for the actual size of door closers, brackets and holders. All door opening sizes are as noted on the Door Schedule and all hardware shall be in strict accordance with requirements of height, width, and thickness.

PART 2 --PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Hinges	McKinney Stanley Bommer	Scranton, PA New Britain, CT Landrum, SC
Geared Hinges	Pemko McKinney Select	Memphis, TN Scranton, PA Kalamazoo, MI
Locksets	Sargent Schlage Best	New Haven, CT Colorado Springs, CO Indianapolis, IN
Exit Devices	Sargent Von Duprin Precision	New Haven, CT Indianapolis, IN Romulus, MI

Door Closers	Sargent LCN Norton	New Haven, CT Princeton, IL Charlotte, NC
Flush Bolts	Glynn Johnson Door Controls Rockwood	Indianapolis, IN Dexter, MI Rockwood, PA
Door Stops	Glynn Johnson Ives Rockwood	Indianapolis, IN New Haven, CT Rockwood, PA
Push /Pulls	Rockwood Burns Ives	Rockwood, PA Erie, PA New Haven, CT
Protective Plates	Rockwood Burns Ives	Rockwood, PA Erie, PA New Haven, CT
Thresholds / Weatherstripping / Rain Drips	NGP Pemko Reese	Memphis, TN Memphis, TN Rosemount, MN
Silencers	Ives Glynn Johnson Rockwood	New Haven, CT Indianapolis, IN 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 given herein 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. Provide, as far as possible, locks of one lock manufacturer and hinges of one hinge manufacturer. 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.

2.03 HARDWARE DESIGNATIONS

- A. 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 submitted to the Architect at least ten (10) days **PRIOR** to the bid date. The Architect shall be the sole judge of any proposed substitution.

2.04 TEMPLATES

- A. Hardware supplier shall immediately, but not later than three (3) days after approval of his Schedule by the Architect, furnish the General Contractor with complete template information necessary for the fabrication of doors, frames, etc. No templates shall be furnished prior to the approval of the hardware schedule.

2.05 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 herein listed shall be provided with no additional charge.

2.06 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: All cylinders shall be Masterkeyed and/or Grandmaster Keyed to a new system as directed.
1. Master Keys, Grandmaster Keys: Furnish six (6) keys for each set, if required.
 2. All cylinders for use at the Aluminum doors, as well as the cylinders being used with the Exit Devices, are to be of the interchangeable core type. These cylinders are to be furnished complete with temporary removable construction cores for use by the contractor during the construction period. These construction cores are to be operated by the same construction key that is established for the balance of the locksets,

cylinders.

3. Furnish three (3) change keys for each cylinder keyed differently; six (6) change keys for each set keyed alike, and in sets where only (2) cylinders are keyed alike, four (4) change keys will be required.
4. All keying is to be done at the factory to avoid duplication of the new cylinders.
5. Master Keys shall be sent to the Owner by registered mail, return receipt required.
6. Supply a bitting list for all change keys and master keys to the Owner.

2.07 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. All hardware shall be installed only with fasteners supplied by manufacturers of specific products.

2.08 PACKING AND MARKING

- A. 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 and shall match finish of hardware with which to be used.
- B. Each package shall be clearly labeled indicating the portion of the work for which it is intended.

2.09 ENVIRONMENTAL CONCERN FOR PACKAGING

- A. 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.

2.10 FINISH HARDWARE DESCRIPTION

A. Hardware items shall conform to respective specifications and standards and to requirements specified herein.

B. MATERIALS AND FINISH: MATERIALS AND FINISHES SHALL BE:

1. Butts: US26D (BHMA 652)
2. Door Closers: Sprayed to match hardware finish
3. Exit Devices: US26D (BHMA 626)
4. Kick, Push Plates: US32D (BHMA 630)
5. All other hardware shall be: US26D (BHMA 626), or as scheduled

C. HINGES:

1. All hinges for this project shall be, steel, stainless steel, solid bronze, ball bearing or oil impregnated bearing type, except as noted.
2. The following is a guide for hinge size (height) and type required for this specification.
 - a.

	<u>MANUFACTURER</u>	<u>EXTERIOR</u>	<u>INTERIOR</u>
1 3/4" Doors up to 3'0" wide	Stanley	FBB191-4 1/2"	FBB179-4 1/2"
	Hager	BB1191-4 1/2"	BB1279-4 1/2"
	McKinney	TA-TB2314-4 1/2"	TA-TB2714-4 1/2"
1 3/4" Doors over 3'0" wide	Stanley	FBB199-4 1/2"	FBB168-4 1/2"
	Hager	BB1199-4 1/2"	BB1168-4 1/2"
	McKinney	T4A-T4B3386-4 1/2"	T4A-T4B3786-4 1/2"

- b. The width of hinges shall be sufficient to clear all trim.
3. Two hinges shall be provided for each door leaf up to and including five feet (5'0") in height. An additional hinge shall be required for each additional two and one half feet (2'6") or fraction thereof in height.
4. All exterior doors, and any interior doors so indicated in hardware sets, shall be furnished with non-removable pins (NRP).
5. Refer to finish section for hinge finish.

D. DOOR CLOSERS:

1. Door closers shall have fully hydraulic, full rack and pinion action. Cylinder body shall be 1-1/2" in diameter, and double heat treated pinion shall be 11/16" in diameter.

2. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Spring power shall be continuously adjustable over the full range of closer sizes, 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. All closers shall have 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. Do not locate closers on the side of doors facing corridors, passageways or similar type 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. All door closers shall be adjusted by the installer in accordance with the manufacturer's templates and written instructions. Closers with parallel arms shall have back-check features adjusted prior to installation.
9. Closers shall conform to all applicable code requirements relative to setting closing speeds for closers and maximum pressure for operating interior and exterior doors.
10. Door closers meeting this specification are as follows:

	LCN	Sargent	Norton
Exterior	4111S-CUSH	281 - CPS	UNI-7500BF
	4111S-H-CUSH	281 - CPSH	UNI-7500BF-H
Interior	4011	281 - 0	7500BF
	4111	281 - P10	PR7500BF
	4040SE	2407 Series	7700PT
	4000T	281 - OT x spec. Temp.	7700STP
	4310ME-SF	2980	7240MPI
	4040SE-DE	2477	7700PT-DE

E. EXIT DEVICES:

1. Shall be Von Duprin, Sargent or Precision as follows:

Function	Von Duprin	Sargent	Precision
A	CD99NL-OP	16-8804	1103CD x 1123-38
B	CD99EO	16-8810	1101CD x 1123-38
C	99L	8813ET	1108 x 39L x 1123-38
D	99L-BE	8815ET	1108A x 39L x 1123-38
E	99EO-F	12-8810	FL-1101 x 1123-38
F	99L-F	12-8813ET	FL-1108 x 39L x 1123-38
G	99L-F-BE	12-8815ET	FL-1108A x 39L x 1123-38
H	CD9927EO	16-8710	1201CD x 1123-38
I	9927L	8713ET	1208 x 39L x 1123-38
J	9927L-BE	8715ET	1208A x 39L x 1123-38
K	CD9927EO x LBR	16-PP/PR8710	1201CD x 1123-38 x LBR
L	9927L x LBR	PP/PR8713ET	1208 x 39L x 1123-38 x LBR
M	9927L-BE x LBR	PP/PR8715ET	1208A x 39L x 1123-38 x LBR
N	9927EO-F	12-8710	FL-1201 x 1123-38
O	9927L-F	12-8713ET	FL-1208 x 39L x 1123-38
P	9927L-F-BE	12-8715ET	FL-1208A x 39L x 1123-38
Q	9927EO-F x LBR	12-PP/PR8710	FL-1201 x 1123-38 x LBR
R	9927L-F x LBR	12-PP/PR8713ET	FL-1208 x 39L x 1123-38 x LBR
S	9927L-F-BE x LBR	12-PP/PR8715ET	FL-1208A x 39L x 1123-38 x LBR

NOTE: Lever design shall match lock trim

F. FLUSH BOLTS:

1. Shall be self-latching or automatic type at label doors, manual flush bolts at non-label doors.

		Glynn Johnson	Door Controls	Rockwood
Manual	HM	FB6	780	555
	WD	FB6W	790	557
Self Latching	HM	FB51P	845	1845
	WD	FB61P	945	1945
Automatic	HM	FB31P	842	1842
	WD	FB41P	942	1942

2. Dust Proof Strikes shall be furnished at all floor locations.

G. LOCKSETS, LATCH SETS:

1. Cylindrical type shall be standard-duty ANSI A156.2, Series 4000, Grade 2, 2-3/4" backset, six pin cylinder with lever handles.

Manufacturer	Series	Lever Design
Schlage	AL	SAT
Sargent	6500	KL
Best	7K	15C

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

Function	Schlage	Sargent	Best
A (Storeroom)	80	04	EW
B (Storeroom)	80	04	EW x Knurled O/S Lever
C (Office)	50	05	E
D (Passage)	10	15	N
E (Vestibule)	60	16	B6/B7
F (Classroom)	70	37	J
G (Spec Classroom)	71	38	INL
H (Privacy)	40	65	LF

H. KICK PLATES, ARMOR PLATES, MOP PLATES:

1. Kick plates shall be 8 in. high. Armor plates shall be 34 in. high. Mop plates shall be 4 in. high. All plates shall be 2 in. less the width of door. Plates shall be .050 thickness, bevel 4 edges, screws shall be oval head counter-sunk.

I. STOPS:

1. Shall be furnished 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.
2. Where wall bumpers cannot be effectively used, a floor stop shall be furnished and installed.
3. Provide roller bumpers for each door where two doors interfere with each other in swinging.

Manufacturer	Wall Bumpers	Floor Stops	Roller Bumpers
Rockwood	409	440,442	456
Ives	407 1/2	436B, 438B	470 Series
Glynn Johnson	WB 50XT	FB13, FB14	RB-3

J. PUSH PLATES, DOOR PULLS, PUSH/PULL BARS:

1. Shall be as manufactured by Rockwood, Burns or Ives.
 - a. Push plates shall be 4" x 16" x .050 thickness unless otherwise listed in hardware sets.

Rockwood 70 Series
Burns 50 Series
Quality 40 Series
 - b. Door pulls shall be 1" x 10"

Type A

Rockwood BF111
Burns BF26C
Quality BF163-10"

Type B

Rockwood 157
Burns 39C
Quality 521
 - c. Push/Pull bars

Type A (Wide Stile Doors)

Rockwood BF11147 x T1006 Mounting
Burns BF26C x 442 x Sim. Mounting as Above
Quality BF482 x Sim. Mounting as Above
Type B (Narrow Stile Doors)
Rockwood 15747 x T1006 Mounting
Burns 39C x 442 x Sim. Mounting as Above
Quality 484 x 10" Sim. Mounting as Above

K. THRESHOLDS, WEATHERSTRIP, SEAL:

1. Thresholds shall be as detailed and furnished on all doors where shown on drawings. Thresholds shall be aluminum unless otherwise indicated. Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants".
2. Weatherstripping shall be furnished on all exterior doors unless otherwise indicated.

Product	Pemko	Reese	NGP
Threshold	as detailed		
Brush Seal	45062AP	970	A626A
Auto. Door Bottom	430CR	330	420
Door Sweep	345AV	353	101AV
Set Astragals	351C x 351CP	95 x 95P	140 x 140P
Astragal	357SP	183S	139SP
Rain Drip	346C	R201A	16AD

L. SILENCERS:

1. Provide silencers on all metal and wood frames. Silencers shall be Ives 20/21, Glynn Johnson 64/65 or Rockwood 608/609.

M. ROLLER CATCHES:

1. Where indicated on the Hardware Sets Provide Model RL 30 by H.B. Ives

PART 3--EXECUTION**3.01. INSPECTION**

1. It shall be the general contractors responsibility to inspect all 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

1. 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

1. All materials shall be installed in a workmanlike manner following the manufacturer's recommended instructions.
2. Exit Devices shall be carefully installed so as to permit friction free operation of crossbar, touch bar, lever. Latching mechanism shall also operate freely without friction or binding.

3. Door Closers shall be installed in accordance with the manufacturer's instructions. Each door closer shall be carefully installed, on each door, 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.
4. The adjustments for all door closers shall be the installers responsibility and these adjustments shall be made at the time of installation of the door closer. The closing speed and the latching speed valves, shall be adjusted individually to provide a smooth, continuous closing action without slamming. The delayed action feature or back check valve shall also be adjusted so as to permit the correct delayed action cycle or hydraulic back check cushioning of the door in the opening cycle. All valves must be properly adjusted at the time of installation. Each door closer has adjustable spring power capable of being adjusted, in the field, from size 2 thru 6. It shall be the installers 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.
5. Installation of all other hardware, including locksets, push-pull latches, overhead holders, door stops, plates and other items, shall be carefully coordinated with the hardware schedule and the manufacturer's instruction sheets.
6. Locations for finish hardware shall be in accordance with dimensions listed in the pamphlet "Recommended locations for Builders' Hardware" published by the Door and Hardware Institute.

3.04 PROTECTION

1. All exposed portions of finish hardware shall be carefully protected, 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. Prior to acceptance of the project by the Architect and owner, the general contractor shall remove the protective material exposing the finish hardware.

3.05 CLEANING

1. It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

3.06 INSTRUCTIONS AND TOOLS

1. It shall be the responsibility of the finish hardware supplier to provide installation and repair manuals and adjusting tools, wrenches, etc... for the following operating products:
 - a. Locksets (all types)
 - b. Exit Devices (all types)
 - c. Door Closers

3.08 HARDWARE SETS

1. 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.

Item 1

Pair Doors 101A, 102A, 103A, 104A, 105A, 106A, 201A, 202A, 203A, 204A, 205A, 206A.

Each door to Have: Lockset (Function E), Kick Plate, Silencers, balance of hardware by door manufacturer.

Item 2

Doors 106B

Each door to Have: Hinges, Exit Device (Function F), Kick Plate, Stop, Silencers, weather stripping, threshold.

Item 3

Doors 106C, 207

Each door to Have: Hinges, Lockset (Function B), Stop, Silencers, weather stripping, threshold.

General Fit out Hardware sets

Item 4

Doors ADA Toilet Room (103B)

Each door to Have: Hinges, Lockset (Function H), Kick Plate, Stop, Silencers

Item 5

Doors to Storage Room (103C)

Door to Have: Hinges, Lockset (Function D), Stop, Kick Plate, Silencers

END OF SECTION