Door Hardware · Section 08710

WEBER STATE UNIVERSITY
Facilities Management

TABLE OF CONTENTS

Part 1 – General

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Scope Requirements and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

A. Definition: “Finish Hardware” includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and in schedules, and as herein specified.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. 1. Division 8 Section “Standard Steel Frames” for silencers integral with hollow metal frames.
2. Division 8 Section “Flush Wood Doors” for factory prefitting and factory premachining of doors for door hardware.
3. Division 8 Section “Aluminum entrances and Storefront” for Entrance Doors
4. Division 8 Section Door Operators” for ADA accessible controls.

1.3 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project’s vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project’s hardware requirements, to Owner, Architect and Contractor.

1. Hardware supplier must be a factory authorized distributor of the products supplied.

C. C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80, NFPA Standard No. 101, and Uniform Building Code requirements. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.

D. D. References: Provide hardware conforming in usage and application to ANSI/BHMA 156.1 through 156.20.

1.4 SUBMITTALS

A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division-1 section “Submittals”. Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finishes.

B. Hardware Schedule: Submit final hardware schedule conforming to DHI Manual "Sequence and Format for the Hardware Schedule", and in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    a. Type, style, function, size and finish of each hardware item.
    b. Name and manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
    e. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
    f. Mounting locations for hardware.
    g. Door and frame sizes and materials.
2. Submittal Sequence: 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. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to he coordinated review of hardware schedule.
3. Keying Schedule: Coordinate key schemes and schedules with existing/campus standard key systems with WSU Project Manager.

C. Samples: If requested by Architect, prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finished as required.

1. Samples, where requested, will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

D. 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.

E. Warranty: Submit manufacturer's standard 5-year written warranty for door closers, and one year warranty for all other hardware, against defects in material and workmanship.

1.5 PRODUCT HANDLING

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. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

Part 2 – Products

2.1 MATERIALS AND FABRICATION

A. General:
   1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
   2. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
   3. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish.
   4. Provide through-bolts and sex bolts for attachment of closers and exit devices to composite filled wood fire doors.
   5. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for WSU's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.2 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

   1. 1. Steel Hinges: Steel pins.

   2. 2. Non-ferrous Hinges: Stainless steel pins.

   3. 3. Out-swing Corridor Doors: Non-removable pins.

   4. 4. Interior Doors: Non-rising pins.

   5. 5. Tips: Flat button and matching plug, finished to match leaves.

   6. 6. Number of hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

D. Furnish hinges in sizes and types as required by architect's details to achieve maximum degree of opening.

E. Acceptable Manufacturers: Refer to tables below:

BUTT HINGES

Mfg	5 Knuckle Std Weight Ball Bearing	5 Knuckle Heavy Weight Ball Bearing	3 Knuckle Std Weight Concealed Bearing	3 Knuckle Heavy Weight Concealed Bearing	5 Knuckle Heavy Weight Swing Clear	3 Knuckle Spring	Plain Bearing
Ives	5BB1	5BB1HW	3CB1	3CB1HW	5BB1SCHW	3SP1	1011
Hager	BB1279	BB1168	AB700	AB750	BB1262	1250	1714
Stanley	FBB179	FBB168	CB1900	CB1901	FB8266	2060R	741
McKinney	TB2713	T4B3386	TB714	TB786	T4B3795	1502	
Bommer	BB5000	BB5004	LB8000	LB80004	BB5024	4310	

CONTINUOUS HINGES

Mfg	Aluminum Full Mortise Geared	Aluminum Full Mortise Geared Edge Protector	Stainless Steel Pin and Barrel Full Mortise	Steel Pin and Barrel Full Mortise	Aluminum XY Adjustable Full Surface (retrofit)
Ives	112HD	224HD	700	600	157XY
Hager	780-112HD	780-224HD	790-900	790-900	
Stanley	661HD	662HD	651	651	
McKinney	MCK-12HD	MCK-25HD			
Markar			FM300	FM200	
Pemko	FMSLFHD	FMHD			

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2.3 LOCK CYLINDERS AND KEYING

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Cylinders to be ASSA V-10 provided by WSU and installed by contractor. Existing non-ASSA keyed spaces are to be coordinated with WSU Project Manager for correct keyway.

C. Furnish temporary keyed cores for the construction period, and remove these when directed. The construction cores remain property of the supplier and shall be returned to the supplier when they are removed. Contractor shall install the permanent cores in the presence of the owner's representative.

2.4 LOCKS, LATCHES AND BOLTS

A. Locks shall meet these certifications:

1. Cylindrical Locks - ANSI A156.2 Series 4000, Grade 1 Strength and Operational requirements. Meets A117.1 Accessibility Codes. Latch bolts shall be steel with minimum ½" throw, deadlocking on keyed and exterior functions. ¾" throw anti-friction latchbolt on pairs of fire doors. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame. Locksets to be tested to exceed 3,000,000 cycles. Lock case shall be steel. Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Provide Seven Year Warranty.

    a. Basis of design for new construction shall be Corbin Russwin 3300 series NZD design, finish US-626, or preapproved equal as per table below:

B. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

1. Lock Manufacturers: Reference table below:

C. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

D. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

Grade 1 Cylindrical Locks	
Manufacturer	
Schlage	ND Series
Corbin Russwin	CL3300 Series
Yale	5400LN Series
Best	9K Series
Marks	95 Series
Falcon	T Series
Sargent	10 Line

2.5 EXIT DEVICES

A. General: All devices and mullions shall be of one manufacturer to provide for proper installation and servicing. Devices shall be furnished non-handed and capable of direct field conversion for all available trim functions. All devices shall carry a minimum three year warranty against manufacturing defects and workmanship.

B. Rim Exit Devices:

1. Devices shall be push through type touch pad design with a straight or horizontal motion to eliminate pinch points. The angular motion type pad with end cavity exposed when depressed is unacceptable. Latch bolt shall have a self-lubricating coating which reduces friction and wear. Plated latch bolts are unacceptable.

2. Applicable devices shall have the adaptability to convert from standard hex key dogging to a high security cylinder dog operation in the field.

    a. No exposed screws shall be seen from the back side (pull side) of the device through a glass lite.

    b. The use of plastic parts to retract the latchbolt is unacceptable. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

3. Quiet Feature: All devices shall incorporate a sound damper which eliminates noise associated with exit device operation.

4. Touch Pad: Shall be architectural metal with a minimum height of 2-3/16". Plastic is not acceptable.

5. Outside Trim: Shall be heavy duty type and fastened by means of concealed welded lugs and thru-bolts from the inside. Lever trim shall be forged brass. Plate with pull shall have forged pulls. Lever trim shall be furnished with vandal resistant levers.

6. End caps shall be sloped and of heavy-duty metal alloy construction and provide horizontal adjustment to provide flush alignment with device cover plate. When device end cap is installed, no raised edges will protrude. End cap shall be cast metal or forged aluminum. Plastic or metal stamping will not be acceptable.

7. Provide all shim kits and filler plates to allow flush mounting of exit devices on all types of doors used in this project.

8. Furnish all exit devices with deadlocking latchbolts.

C. Acceptable Manufacturers: Reference table below

Exit Devices		
Manufacturer	**Rim with Secure Bolt Latch**	**Rim**
Von Duprin	XP98	98/35A
Falcon		24/25
Sargent		88 Series
Corbin Russwin	ED5200S	ED5000
Yale	7150	7000
Precision		2100

2.6 CLOSURES AND DOOR CONTROL DEVICES

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

B. Closers: All door closers shall be of one manufacturer to provide for proper installation and servicing after installation. All closers shall be inspected after installation by a factory representative to ensure proper adjustment and operation. Closer shall carry a manufacturer's 10 year warranty for hydraulic units and 2 year warranty for electrical and/or handicap power assist door closers against manufacturing defects and workmanship.

C. Low-Energy Door Operators: Comply with ANSI/BHMA 156.19 Electric power-open, hydraulically checked spring power closing. Modular construction. Finished metal cover. Field-adjustable opening force, opening speed, time-open, closing and latching speeds. Door reopens and timing cycle restores if system reactuated during closing cycle. Breakaway clutch protection from forced closing. Door, frame, motor and drive train protected by attenuated initiation of opening cycle.

   1. Self-contained low-voltage power supply, terminal strip and sequencing for incorporation of electric hardware with system operation.

D. Cylinder: Shall be of high strength cast iron construction. All door exterior closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified independent testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles for all exterior door closers must be provided. Cylinder shall have been manufactured and in the marketplace for a minimum of 10 years.

E. All door closers shall be fully hydraulic and have full rack and pinion action. Pinion and pistons shall be hardened regardless of closer size. The closer shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging. Closer shall have separate and independent screw valve adjustments for latch speed, general speed and hydraulic backcheck. Backcheck shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location.

F. All door closers shall pass UL10C positive pressure fire test.

G. Parallel Arm Closers: All other closers to have forged steel main arms for strength, and durability.

H. All closers to have a powder coat finish on closer body, arm, metal cover and adapter plate. Powder coat finish shall exceed a minimum 100 hour salt spray test, as described in ANSI Standard A156.4 and ASTM B117.

I. Hydraulic Fluid: All closers, with the exception of interior electronic closers, shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees F. to -30F without requiring seasonal adjustment of closer speed to properly close the door.

J. Supply all drop plates, shoe supports, templates, etc. to properly install closers according to manufacturer's recommendations.

K. Closer being submitted for approval shall have been manufactured for at least 10 years. A list of (10) year old projects using submitted closer shall be available upon request.

L. All door closers shall be furnished with metal covers.

M. Closer Manufacturers: Subject to compliance with requirements, provide closer products of the following approved manufacturers:

1. LCN Closers – 4000 EDA
2. Sargent Closers – 281, 281 P10
3. Corbin/Russwin – DC2000, DC2000 A3

CLOSERS									
Mfg	**Heavy Duty Cast Iron**	**Heavy Duty Aluminum**	**Standard Duty Cast or Aluminum**	**Light Duty Cast or Aluminum**	**Electro-Mechanical Closers**	**Mag Holders**	**ADA Operators Electro-Hydraulic**	**ADA Operators Electro-Mechanical**	**ADA Operators Pneumatic (Blow Open)**
LCN	4040XP		1460	1261	4040SE/ 4300ME	SEM7800	4600	2800/9500/ 9100	2600
Falcon		SC71	SC81	SC61				8200	
Sargent	281	351	1431	1130		1500	Mpower 3000	3000	
Corbin Russwin	DC8000		DC6000	DC3000					
Yale		400	3000	50					
Norton		7500	8000	1600	7700PT/ 7210 MPI		6900	5900	
Stanley		D-4550	D-3550	D1650			D-4990	Magic Force	

2.7 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screws.

B. Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than door dimension.

C. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated.

D. Where existing doors are receiving new hardware, provide new protection plates on all doors that have existing plates, if not already specified. New plates are to be of equal or greater size than existing plates.

E. Metal Plates: Stainless steel, .050" (U.S. 18 ga.).

F. Acceptable Manufacturers: Reference table below:

TRIM								
Mfg	**Flushbolts Narrow/Std**	**Automatic Flushbolts WD/HM**	**Surface Bolts**	**Dustproof Strikes**	**Coordinators**	**Push/Pull**	**Offset Pulls**	**Offset Post Pulls**
Ives	FB 358/FB458	FB31/FB41	SB453/054	DP1/DP2	COR x FL x MB	8200/8305	8190	9264F
Rockwood	557/555	1842/1948	580/630-4	570	1600 x 1601	70C/111x70C	BF157	RM331
Hager	283D/282D	282D/291D	275D/279D	280X	297	30S/31J	12	
Trimco	3915/3917	3810/3815	3923/ 2930-4	3910/3911	3094 x 3095	1001/1018	1191	

2.8 WEATHERSTRIP AND GASKETING

A. General: Except as otherwise indicated, provide continuous weather stripping at each leaf of every exterior door. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips is easily replaceable and readily available from stocks maintained by the manufacturer.

C. Acceptable Manufacturers:

1. Pemko
2. National Guard Products
3. Or preapproved equal

2.9 THRESHOLDS

A. General: Except as otherwise indicated provide standard aluminum threshold unit of type, size and profile as shown or detailed, clear anodized.

B. Provide welded custom thresholds where scheduled and noted in the hardware sets. Provide cover plates where scheduled.

C. Provide thresholds that are 1" wider than depth of frame

D. Acceptable Manufacturers:

1. National Guard Products
2. Pemko
3. Or preapproved equal

2.10 HARDWARE FINISHES

A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.

B. The designations used to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

C. 26D finish is our preferred standard.

2.11 ELECTRONIC ACCESS AND CONTROL LOCKS (CENTRAL SYSTEM)

A. Electronic access control system software is Lenel OnGuard.

B. Credential standard is multiclass proximity, mag stripe, Allegion AptiQ compatible.

C. Electrical latch retraction exit devices are preferred over electric strikes.

D. Hard wiring is preferred for exterior applications

E. Wireless applications will be acceptable for interior spaces as assessed and approved by WSU Locksmith.

F. All door position switches are to be concealed (no surface mount, unless preapproved with WSU).

ACCESS CONTROLLED LOCKS						
Mfg	**Pincode Mechanical**	**Stand-Alone**	**Stand-Alone Remote Classroom Security**	**Hardwired Access Controlled Locks**	**Wireless Access Controlled Locks**	**Electro-Magnetic Locks**
Schlage Electronics	CO-100	CO-200/AD200	CO-220	AD-300	AD-400	M490 GF3000
Sargent	KP Series	Profile Series	Profile Series	Profile Series	Profile S2 Series	70C/111x70C
Alarm Lock	DL2700					
Corbin Russwin		Access 800 AC2			Access 800 WII	
Best					Wi-Q	
Security Door Cntls						1510/1561
Securitron						M82/SAM

ELECTRIC STRIKES			
Mfg	**Pincode Mechanical**	**Stand-Alone**	**Stand-Alone Remote Classroom Security**
Von Duprin	6300	6000	5000
HES	9000	1006	8000

2.12 STAND-ALONE ELECTRONIC ACCESS DEVICES

A. Preferred standard: AlarmLock Trilogy Device or preapproved equal. Verify device model with WSU Project Manager and/or WSU Locksmith.

Part 3 – Execution

3.1 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. 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-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.2 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. 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 in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct WSU in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

END OF SECTION