

**SECTION 08 71 00
DOOR HARDWARE**

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. Builders Hardware Manufacturer's Association (BHMA):
 - a. A156.1, Butts and Hinges.
 - b. A156.2, Bored and Preamsembled Locks and Latches.
 - c. A156.3, Exit Devices.
 - d. A156.4, Door Controls - Closers.
 - e. A156.10, Standard for Power Operated Pedestrian Doors.
 - f. A156.13, Mortise Locks & Latches.
 - g. A156.16, Auxiliary Hardware.
 - h. A156.18, Materials and Finishes.
 - i. A156.19, Standard for Power Assist and Low Energy Power Operated Doors.
2. International Code Council (ICC): A117.1, Accessible and Usable Buildings and Facilities.
3. UL: Fire Protection Equipment List.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Product Data: Manufacturer's literature for each item of finish hardware required herein, clearly marked.
 - b. Finish Hardware Schedule: Furnish complete and detailed schedule, show product items, numbers, and finishes for hardware for each separate opening.
 - c. Provide documentation demonstrating confirmation of Park's cylinder and keying requirements.
 - d. Special Tools: Provide listing and description of usage.

B. Informational Submittals:

1. Operation and Maintenance Data as specified in Section 01 78 23, Operation and Maintenance Data.
2. Certification of Hardware Consultant.
3. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 67 00, Product Requirements.
 - a. Manufacturer's Field Service Report.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum 3 years' documented experience.
- B. Qualifications of Supplier: Recognized supplier of architectural finish hardware, with warehousing facilities, who has been furnishing hardware in vicinity of Project for not less than 5 years, and who is, or who employs, architectural hardware consultant.
- C. Qualifications of Architectural Hardware Consultant (AHC): Certified by Door and Hardware Institute.
- D. Comply with applicable accessibility requirements of ABAAS.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Before delivery, clearly identify and tag each item of hardware with respect to specified description and location of installation.
- B. Provide secure storage for finish hardware until installation is made.

1.05 EXTRA MATERIALS

- A. Special Tools: Two sets for installation and maintenance of hardware.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide end products of one manufacturer for each product in order to achieve standardization for appearance, maintenance, and replacement.
- B. Finishes: BHMA A156.18.

2.02 FASTENERS

- A. Provide fasteners of type, quality, size, and quantity appropriate to the specific application. Fastener finish to match hardware. Provide Type 304 stainless steel or other nonferrous metal. Verify metals in contact with one another are compatible and will avoid galvanic corrosion when exposed to weather.

2.03 BUTT HINGES

- A. Manufacturers:
 - 1. McKinney.
 - 2. Or equal.

B. Physical Characteristics:

1. Width: Minimum for clearance of trim and 180-degree swing.
2. Exterior Hinges: Nonremoveable pin.
3. Joint Tolerance: 0.012 inch maximum, gauged in CLOSED position.
4. Material and Finish: Satin stainless steel No. 630.

C. Functional Characteristics:

1. Quantity per Door Leaf (Minimum):

Door Height	Hinges
Up to 5'-0"	1 pair
5'-1" to 7'-7"	1-1/2 pair
7'-8" to 10'-0"	2 pairs
10'-1" to 12'-6"	2-1/2 pairs

2. Hinge Height (Minimum):

Door Width	Hinge Height
Up to 3'-0"	4-1/2"
3'-1" to 4'-0"	5"
Over 4'-0"	6"

3. Hinge Types:

No.	Type Description	Product	ANSI
H1	Regular weight, two ball-races, full mortise, stainless steel	TB2314	A5112

D. Performance Characteristics: ANSI A156.1.

2.04 LOCKS AND LATCH SETS

A. Manufacturers and Products:

1. Schlage; 03.
2. Or equal.

B. Physical Characteristics:

1. Materials: Brass or stainless steel.
2. Trim: Wrought or forged lever handles and roses.
3. Finish:
 - a. Satin stainless steel No. 630.
 - b. Coat exterior levers with polytetrafluoroethylene (PTFE).

C. Functional Characteristics:

1. Core Cylinders: Interchangeable, removable; minimum of six pins.
2. Provide Schlage Keyway cylinder.
3. Bolt Throw: 5/8 inch minimum.
4. Lever Backset: 2-3/4 inches.
5. Lock and Latch Types:

No.	Type Description	Product	ANSI
L1	Mortise entrance lock with lever handle	L9456P-03	F12, F13
L3	Mortise passage latch with lever handle	8215-LNJ	F07
L5	Mortise utility room lock with lever handle	L9080-03	F07
L8	Mortise privacy lock with lever handle and occupancy indicator and inside thumbturn	L9040-03 OS-OCC	F19, F22
L14	Mortise classroom lock with lever handle	L9070-03	F05
L16	Lock by exit device manufacturer; furnish cylinders for keying to other locks as required		

6. Keying:
 - a. Lock Cylinders: Schlage Keyway system. Provide to Contracting Officer prior to Project completion for Park locksmith to perform final keying and installation.
 - b. Keylocks: As directed by Contracting Officer.
 - c. Keys: Two per lock; tag with schedule information.
 - d. Master Keys: Four; send by registered mail to Contracting Officer.

D. Performance Characteristics:

1. Mortise Locks: ANSI A156.13, Series 1000, Grade 1.

2.05 CONSTRUCTION KEY SYSTEM

- A. Removable construction core system for locks.
- B. See Article Manufacturer's Services under Part 3, Execution.

2.06 EXIT DEVICES

A. Manufacturers:

1. Von Duprin.
2. Or equal.

B. Physical Characteristics:

1. Finish:
 - a. Exit Device: Satin chromium-plated No. 626.
 - b. Removable Mullion: Aluminum with prime coat.

C. Functional Characteristics:

1. Furnish fire exit devices and mullions at fire-rated doors.
2. Lever trim with escutcheon.
3. Key Lockable, Removable Mullion: Aluminum construction, by exit device manufacturer.
4. Exit Device Types:

No.	Type Description	Products	ANSI
X1	Rim type, active leaf; with removable mullion for pairs	99L03	Type 1 08

D. Performance Characteristics: ANSI A156.3.

2.07 CLOSERS

A. Manufacturers:

1. Sargent.
2. Or equal.

B. Physical Characteristics:

1. Arm Material: Forged steel.
2. Body Material: Die cast aluminum.
3. Closer Covers: High impact plastic of flame retardant grade; aluminum color.
4. Finish: Manufacturer's standard powder coated finish in aluminum color.

C. Functional Characteristics:

1. Full rack and pinion type with steel spring and non-freezing hydraulic fluid.
 - a. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
 - b. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors as scheduled.
 - c. Maximum Operating Pressure and Closing Speed for Accessible Doors:
 - 1) Maximum operating pressure as follows:
 - a) Interior Doors: Maximum 5 force pounds.
 - b) Exterior Doors: Maximum 8.5 force pounds.
 - 2) Closing Speed (from 90-degree position to 12 degrees from latch): 5 second minimum.
2. Size closers in accordance with manufacturer's standards. Mount regular arm closers on pull side of doors. Mount parallel arm closers on push side of doors. On pair of doors provide closer on active leaf only, unless noted otherwise.
3. Closer Types:

No.	Type/Description	Products	ANSI
C1	Regular arm	351 Series	C02011
C3	Regular arm with hold-open	351-H Series	C02051
C6	Parallel arm with integral stop and hold-open	351-PSH Series	C02061

D. Performance Characteristics:

1. ANSI A156.4, Grade 1.
2. ADA and ANSI A117.1 compliant.
3. UL 10C rated for positive pressure fire test.

2.08 SWING DOOR OPERATOR

A. Manufacturers:

1. Stanley.
2. Or equal.

B. Physical Characteristics:

1. Power assisted door operator with slam protection, power close, and safety presence sensor.
2. Material: Aluminum in clear anodic finish.

3. Mounting: Surface.
4. Door Arms: A combination of door arms and linkage shall provide positive control of door through entire swing; units shall permit use of butt hung doors.
5. Provide door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
6. Power: 120V ac, 5 amps minimum, 50/60-Hz.
7. Electromechanical Operators: Self-contained unit powered by a minimum 3/16 hp, permanent-magnet DC motor; through a high torque reduction gear system.
8. Signage: 6-inch minimum diameter with wording "Automatic Caution Door" with black lettering on a yellow background on both sides of the door.

C. Functional Characteristics:

1. Manual Use: The operator shall function as a manual door closer in the direction of swing with or without electrical power. The operator shall deliver an even, consistent open force across the entire transition from door fully closed to door fully open.
2. Operator Type:

No.	Type Description	Products	ANSI
O1	Automatic Swing Door Operator	M-Force	A156.10

D. Performance Characteristics:

1. ANSI/ BHMA A156.10.
2. ANSI/ BHMA A156.19.
3. The operator shall be designed to output audible noise ratios less than or equal to 50 dba.

2.09 PUSH PLATES

A. Manufacturers:

1. Stanley.
2. Or equal.

B. Physical Characteristics:

1. Hard-wired 4-1/2-inch square push plates.
2. Engraved with international symbol of accessibility and "Push To Open".

C. Functional Characteristics:

1. Easy to press and safe accessibility for all pedestrians.
2. Push Plate Type:

No.	Type Description	Products	ANSI
P1	Push to open plate switch	D400	A156.10

D. Performance Characteristics: ADA compliant.

2.10 STOPS AND HOLDERS

A. Manufacturers:

1. Overhead Stops and Hold-Open:
 - a. Sargent.
 - b. Or equal.

B. Physical Characteristics:

1. Overhead Stop with Hold-Open:
 - a. Body Material: Bronze.
 - b. Finish: Satin Chrome, 26D.
 - c. Hold-open Range: 85 degrees to 110 degrees.
 - d. Non-Handed.

C. Functional Characteristics:

1. Machine Screws: In threaded anchors at concrete or masonry.
2. Self-Tapping Screws: At stud partitions, wood, or metal mountings.
3. Stop and Holder Types and Manufacturers for Each Leaf:

No.	Type Description	Manufacturers and Products	ANSI
S1	Floor stop	Baldwin; 4000	L02131
S2	Wall bumper	Baldwin; 4273	L02241
S7	Overhead stop with hold-open	Sargent; 590H Series	C05541

D. Performance Characteristics:

1. Overhead Stop and Hold-Open: ANSI A158, Grade 1.

2.11 BOLTS

A. Manufacturers:

1. Ives.
2. Or equal.

B. Physical Characteristics:

1. Bolt Throw: 3/4 inch.
2. Rod Length: 12 inches minimum.
3. Finish: Satin Chrome No. 626.

C. Functional Characteristics:

1. Bolts are nonhanded and suited for hollow metal doors and manually operated. Top bolt extends to door frame and bottom bolt extends to dustproof strike in floor (and coordinated with threshold where occurs).
2. Bolt Types and Manufacturers:

No.	Type/Description	Product	ANSI
B1	Top and bottom flush bolts and dust proof strike for bottom bolt	FB457 & DP1	L04201

D. Performance Characteristics:

1. UL 10C Listed (3 hours) for fire doors.
2. ANSI A156.3.

2.12 KICKPLATES

A. Manufacturers:

1. Rockwood.
2. Or equal.

B. Physical Characteristics:

1. Solid metal, not plated. Bevel four edges.
2. Finish: Satin stainless steel No. 630.

C. Functional Characteristics:

1. Width of door leaf less than 1-1/2 inches at single leaf and less than 1 inch at pairs.
2. Types:
 - a. K1: 10 inches high by 0.125 inch thick.

D. Performance Characteristics: None.

2.13 THRESHOLDS

A. Manufacturers:

1. Pemko.
2. Or equal.

B. Physical Characteristics:

1. One-piece full width of opening (between door jambs).
2. Finish: Mill finish aluminum, unless indicated otherwise.

C. Functional Characteristics:

1. Provide with stainless steel machine screws in threaded expansion anchors at concrete.
2. Types:

No.	Type Description	Pemko
T2	Saddle (serrated, 4" x 1/4")	270A

D. Performance Characteristics:

1. ANSI A156.21.
2. ADA barrier-free and ANSI A117.1 compliant.

2.14 WEATHERSTRIP

A. Manufacturers:

1. Pemko.
2. Or equal.

B. Physical Characteristics:

1. Gaskets:
 - a. Material: Rubber (or vinyl) with adhesive backing for mounting to door frame.

- b. Size: 1/4 inch high by 1/2 inch wide; capable of compressing to seal up to a 1/16-inch gap.
 - c. Finish: Black.
- 2. Door Shoes:
 - a. Material: Aluminum; U-shaped configuration.
 - b. Size: Length to match door by 1-5/8 inches height.
 - c. Finish: Dark bronze anodized.
- 3. Rain Drips:
 - a. Material: Aluminum.
 - b. Size: Length of 4 inches longer than door by width of 2-1/2 inches by 5/8 inch.
 - c. Finish: Dark bronze anodized.

C. Functional Characteristics:

- 1. Gaskets: Furnish continuous weatherstripping at top and sides of exterior doors.
- 2. Door Shoes: Provides seal between bottom of hollow metal door and threshold.
- 3. Rain Drips: Directs water away from door head.
- 4. Types and Manufacturers:

No.	Type Description	Product
W1	Rubber or vinyl bulb at jambs and head, and at meeting stiles of pairs	S88D
	Door shoe	222DV
	Rain drip	346D
W2	Rubber or vinyl bulb at jambs and head, and at meeting stiles of pairs	S88D
	Door shoe	222DV

D. Performance Characteristics:

- 1. Gaskets:
 - a. Air Infiltration (Maximum 0.09 cfm): Meet ASTM E283.
 - b. ANSI A156.22.
- 2. Door Shoes:
 - a. Air Infiltration (Maximum 0.09 cfm): Meet ASTM E283.
 - b. ANSI A156.22.
- 3. Rain Drips: None.

2.15 MISCELLANEOUS ITEMS

- A. Provide as indicated in Door and Hardware Schedule as shown on the Drawings:

M1	Nameplate as specified in Section 10 14 00, Signage, in text noted in Door and Hardware Schedule
M2	Nameplate and barrier-free pictorial symbol as specified in Section 10 14 00, Signage, in text noted in Door and Hardware Schedule

2.16 SILENCERS

- A. Physical Characteristics: High-grade, durable grey rubber.
- B. Functional Characteristics:
1. At metal frame of each hinged door that does not have seals scheduled.
 2. Three at single leaves and two at pairs.
- C. Performance Characteristics: None.

2.17 TEMPLATES

- A. Fabricate to template hardware applied to metal doors and frames.
- B. Ensure that required templates are furnished to various manufacturers for fabrication purposes.
- C. Templates: Make available not more than 10 days after receipt of approved Hardware Schedule.

2.18 EXIT AND FIRE DOORS

- A. Exit Doors: Always openable from inside by simple turn of lever handle or push on panic bar without use of key or any special knowledge or effort, to include at least one leaf of door pairs.
- B. Hardware for Fire Doors: UL, Fire Protection Equipment List.

PART 3 EXECUTION

3.01 INSTALLATION

- A. In accordance with manufacturer's written instructions.
- B. Make Work neat and secure, develop full strength of components, and provide proper function.
- C. Prevent marring, scratching, or otherwise damaging adjacent finishes during hardware installation.
- D. Latchbolts:
 - 1. Install to engage in strikes automatically, whether activated by closers or manually.
 - 2. In no case shall additional manual pressure be required to engage latchbolt in strike.
- E. Stops and Holders: Set to allow doors to open as far as possible.
- F. Wall Mounted Hardware: Install over solid structural backing or solid blocking in hollow walls.
- G. Thresholds:
 - 1. Cope ends neatly to profile of jamb.
 - 2. Set in sealant and seal ends to jambs.
- H. Hardware: Adjust for easy, noise-free operation.
- I. Replace damaged hardware items.

3.02 MOUNTING DIMENSIONS

- A. Standard Door Hardware Locations: As recommended and published by Door and Hardware Institute, except as noted or detailed otherwise.
- B. Door Silencers: Install 3 inches from top and bottom of jamb and 1 inch above strike at single doors, and 3 inches from edges of doors in head for pairs of doors.
- C. Nameplates: See Section 10 14 00, Signage, for mounting height.

3.03 MANUFACTURER'S SERVICES

- A. Deliver permanent lock cores to Site.
- B. Remove temporary construction cores and insert permanent cores.
- C. Inspect each lock set to ensure permanent cores are operating satisfactorily.
- D. Deliver to Contracting Officer change and control keys for permanent system.
- E. Return temporary construction cores to manufacturer.
- F. Furnish manufacturer's representative for the following services at Site or classroom as designated by Contracting Officer:
 - 1. For installation assistance, inspection, and Manufacturer's Certificate of Proper Installation.
 - 2. For functional and performance testing.

3.04 PROTECTION

- A. Cover and protect exposed surfaces of hardware during installation and until Substantial Completion.
- B. Fit, dismantle, and reinstall finish hardware as required for finish painting work.
- C. Protect and prevent staining of hardware during construction in accordance with manufacturer's recommendations.
- D. Remove protective measures and permanent lock cylinders installed prior to final cleaning.

3.05 DOOR AND HARDWARE SCHEDULE

- A. Door and Hardware Schedule as shown on the Drawings, is guide to functional requirements of each opening.
- B. Provide finish hardware as scheduled. Items omitted shall be as recommended by manufacturer or Architectural Hardware Consultant for fully functional hardware set.

3.06 HARDWARE SETS

HDW-1:	Item	Type
	1-1/2 Pair butt hinges	H1
	1 Exit device (rim type) with cylinders for keying to other locks as required	X1/L16
	1 Swing door operator	O1
	2 Push plates	P1
	1 Metal kickplate	K1
	1 Threshold	T2
	1 Set weatherstrip	W2
HDW-2:	Item	Type
	3 Pair butts	H1
	2 Exit devices (rim type) with cylinders for keying to other locks as required	X1/L16
	1 Removable mullion	X1
	2 Closers	C6
	2 Metal kickplates	K1
	1 Threshold	T2
	1 Set weatherstrip	W2
HDW-3:	Item	Type
	1-1/2 Pair butts	H1
	1 Lock	L5
	1 Closer	C3
	1 Wall stop	S2
	1 Metal kickplate	K1
	1 Nameplate	M1

HDW-4:	Item	Type
	3 Pair butts	H1
	1 Lock (on active leaf)	L1
	1 Set flush bolts (on inactive leaf)	B1
	1 Closer (on active leaf)	C6
	1 Threshold	T2
	2 Metal kickplates	K1
	1 Set weatherstrip	W1
	1 Nameplate	M1
HDW-5:	Item	Type
	3 Pair butts	H1
	1 Lock (on active leaf)	L1
	1 Set flush bolts (on inactive leaf)	B1
	1 Closer (on active leaf)	C6
	1 Threshold	T2
	2 Metal kickplates	K1
	1 Set weatherstrip	W2
	1 Nameplate	M1
HDW-6:	Item	Type
	3 Pair butts	H1
	1 Lock (on active leaf)	L1
	1 Set flush bolts (on inactive leaf)	B1
	1 Closer (on active leaf)	C6
	2 Metal kickplates	K1
	1 Nameplate	M1

HDW-7:	Item	Type
	1-1/2 Pair butts	H1
	1 Exit device (rim type) with cylinder for keying to other locks as required	X1/L16
	1 Closer	C6
	1 Threshold	T2
	1 Set weatherstrip	W1
	1 Nameplate	M1
HDW-8:	Item	Type
	1-1/2 Pair butts	H1
	1 Lock	L14
	1 Closer	C1
	1 Wall bumper	S2
	1 Metal kickplate	K1
	1 Nameplate	M1
HDW-9:	Item	Type
	1-1/2 Pair butts	H1
	1 Privacy lock	L8
	1 Wall bumper	S2
	1 Nameplate and Pictorial Symbol	M2
HDW-10:	Item	Type
	1-1/2 Pair butts	H1
	1 Latch	L5
	1 Metal Kickplate	K1
	1 Overhead stop	S7
	1 Wall bumper	S2
	1 Nameplate	M1

HDW-11:	Item	Type
	1-1/2 Pair butts	H1
	1 Lock	L1
	1 Closer	C6
	1 Threshold	T2
	1 Metal kickplate	K1
	1 Set weatherstrip	W1
	1 Nameplate	M1
HDW-12:	Item	Type
	1-1/2 Pair butts	H1
	1 Exit device (rim type) with cylinder for keying to other locks as required	X1/L16
	1 Closer	C1
	1 Threshold	T2
	1 Kickplate	K1
	1 Nameplate	M1
HDW-13:	Item	Type
	1-1/2 Pair butts	H1
	1 Exit device (rim type) with cylinder for keying to other locks as required	X1/L16
	1 Closer	C6
	1 Threshold	T2
	1 Set weatherstrip	W2
	1 Nameplate	M1
HDW-14:	Item	Type
	1-1/2 Pair butts	H1
	1 Lock	L1
	1 Closer	C6
	1 Threshold	T2
	1 Set weatherstrip	W1

HDW-15:	Item	Type
	1-1/2 Pair butts	H1
	1 Exit device (rim type) with cylinder for keying to other locks as required	X1/L16
	1 Closer	C6
	1 Threshold	T2
	1 Kickplate	K1
HDW-16:	Item	Type
	1-1/2 Pair butts	H1
	1 Privacy lock	L8
	1 Floor stop	S1
	1 Nameplate and Pictorial Symbol	M2
HDW-17:	Item	Type
	1-1/2 Pair butts	H1
	1 Latch	L3
	1 Closer	C6
	1 Metal kickplate	K1
	1 Nameplate	M1
HDW-18:	Item	Type
	1-1/2 Pair butts	H1
	1 Exit device (rim type) with cylinder for keying to other locks as required	X1/L16
	1 Closer	C3
	1 Wall stop	S2
	1 Metal kickplate	K1
	1 Nameplate	M1

HDW-19:	Item	Type
	Butt Hinges (quantity as required for door height)	H1
	1 Lock	L5
	1 Set weatherstrip	W1
HDW-20:	All hardware by door manufacturer except cylinder.	

END OF SECTION