SECTION 08710 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

   a. Swinging doors.

2. Cylinders for door hardware specified in other Sections.

B. Related Sections:

1. Section 06411 "Wood-Veneer-Faced Architectural Cabinets" for cabinet door hardware provided with cabinets.
2. Section 08311 "Access Doors and Frames" for access door hardware, except cylinders.

C. Products furnished, but not installed, under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1. Lock cylinders to be installed under other Sections.
2. Permanent lock cores to be installed by Owner.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: For plastic protective trim units in each finish, color, and texture required for each type of trim unit indicated.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
c. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
d. Content: Include the following information:

1) Identification number, location, hand, fire rating, size, and material of each door and frame.
2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
5) Fastenings and other pertinent information.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For electrified door hardware, from the manufacturer.

1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Warranty: Special warranty specified in this Section.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish to the Owner two dozen extra screws and other fasteners of each size, type and finish used with the hardware items provided.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Source Limitations: Obtain each type of door hardware from a single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

C. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

D. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:

   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

E. Keying Conference: Conduct conference at Project site to comply with requirements in Section 01310 "Project Management and Coordination." In addition to Owner, Construction Manager, Contractor, and Architect, conference participants shall also include Installer's Architectural Hardware Consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Address for delivery of keys.

F. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Review required testing, inspecting, and certifying procedures.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.9 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.

c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.

a. Manual Closers: 10 years from date of Substantial Completion.

1.11 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and [named manufacturers' products or products equivalent in function and comparable in quality to named products as approved by the Architect.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 HINGES

A. Hinges: BHMA A156.1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Bommer Industries, Inc.
b. Hager Companies.
c. IVES Hardware; an Ingersoll-Rand company.

2.3 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch latchbolt throw.
2. Mortise Locks: Minimum 3/4-inch latchbolt throw.
3. Deadbolts: Minimum 1-inch bolt throw.

C. Lock Backset: 2-3/4 inches, unless otherwise indicated.

D. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

E. Mortise Locks: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. SARGENT Manufacturing Company; an ASSA ABLOY Group company: 8200 Series with LNP lever design.
b. Schlage Commercial Lock Division; an Ingersoll-Rand company: L Series with 17 A lever design.

2.4 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

1. Manufacturer: Subject to compliance with requirements, provide products by the following

a. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

B. Standard Lock Cylinders: BHMA A156.5; permanent cores that are removable; face finished to match lockset.

C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.5 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.

1. Existing System:

a. Master key or grand master key locks to Owner's existing system: Sargent – NO SUBSTITUTIONS.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: Information to be furnished by Owner.

2. Quantity: In addition to one extra key blank for each lock, provide the following:

a. Cylinder Change Keys: Locks keyed alike: 4 per set / locks keyed differed: 3 per lock.
b. Master Keys: Six per master group.
c. Grand Master Keys: Five.
d. Great-Grand Master Keys: Five.

2.6 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:

a. Falcon Lock; an Ingersoll-Rand company.
b. Norton Door Controls; an ASSA ABLOY Group company.
c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

2.7 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:

a. Architectural Builders Hardware Mfg., Inc.
b. Glynn-Johnson; an Ingersoll-Rand company.

c. Rixson Specialty Door Controls; an ASSA ABLOY Group company.

2.8 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:

a. Hager Companies.
b. IVES Hardware; an Ingersoll-Rand company.
c. Rockwood Manufacturing Company.

2.9 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
3. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.10 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.

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

2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.
2. Furnish permanent cores to Owner for installation.

E. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01820 "Demonstration and Training."

3.7 DOOR HARDWARE SCHEDULE

A. Hardware Set 001

Door numbers: W4-41C, W4-44C

Each to have:

3	Ea	Hinge	5BB1 4.5 x 4.5	652	Ives
1	Ea	Store/Utility Room Lock	L9466L 06A	626	Schlage
1	Ea	Mortise Cylinder	64-41 x Required Cam	626	Sargent
2	Ea	Cylinder Core	10 6300		Sargent
2	Ea	Kick Plate	8400 10” x 2” LDW	630	Ives
1	Ea	Wall Stop	WS406CCV or FS438	630	Ives
3	Ea	Silencer	S64	GRY	Ives

B. Hardware Set 002

Door numbers: W4-22D

Each to have:

3	Ea	Hinge	5BB1 4.5 x 4.5	652	Ives
1	Ea	Store/Utility Room Lock	L9466L 06A	626	Schlage
1	Ea	Mortise Cylinder	64-41 x Required Cam	626	Sargent
2	Ea	Cylinder Core	10 6300		Sargent
2	Ea	Kick Plate	8400 10” x 2” LDW	630	Ives
1	Ea	Overhead Stop	450S	630	Ives
3	Ea	Silencer	S64	GRY	Ives

C. Hardware Set 003

Door numbers: W4-29A, ~~**W4-29B**~~

Each to have:

6	Ea	Hinge	5BB1 4.5 X 4.5 NRP	652	Ives
2	Ea	Manual Flushbolt	FB458	626	Ives
1	Ea	Dust Proof Strike	DP2	626	Ives
1	Ea	Store/Utility Room Lock	L9080L 06A	626	Schlage
1	Ea	Mortise Cylinder	64-41 X REQUIRED CAM	626	Sargent
1	Ea	Cylinder Core	10 6300		Sargent
2	Ea	Wall Stop	WS406CCV OR FS438	630	Ives
2	Ea	Silencer	SR64	GRY	Ives

D. Hardware Set 004

Door numbers: W4-28A

Each to have:

3	Ea	Hinge	5BB1 4.5 x 4.5 NRP	652	Ives
1	Ea	Storeroom Lock	L9080L 06A	626	Schlage
1	Ea	Mortise Cylinder	64-41 x Required Cam	626	Sargent
1	Ea	Cylinder Core	10 6300		Sargent
1	Ea	Surface Closer	SC71 RW/PA	689	Falcon
1	Ea	Overhead Stop	100S	630	Ives
3	Ea	Silencer	S64	GRY	Ives

E. Hardware Set 005

Door numbers: W4-22E, **W4-22C,** ~~**W4-28B,**~~ W4-28C, W4-44B, W4-47B, W4-41B

Each to have:

3	Ea	Hinge	5BB1 4.5 x 4.5	652	Ives
1	Ea	Passage Set	L9010 06A	626	Schlage
2	Ea	Kick Plate	8400 10” x 2” LDW	630	Ives

1	Ea	Wall Stop	WS406CCV or FS438	630	Ives
3	Ea	Silencer	S64	GRY	Ives

F. Hardware Set 006

Door numbers: W4-27, W4-37, W4-50, W4-21~~**(ALT GT-1)**~~, W4-22A~~**(ALT GT-1)**~~, W4-22B~~**(ALT GT-1)**~~, **W4-28B,** W4-38~~**(ALT GT-1)**~~, W4-41A~~**(ALT GT-1)**~~, W4-44A~~**(ALT GT-1)**~~, W4-47A~~**(ALT GT-1)**~~

Each to have:

3	Ea	Hinge	5BB1 4.5 X 4.5 NRP	652	Ives
1	Ea	Power Transfer	EPT-10	689	Von Duprin
1	Ea	Panic Hardware	CX98L 996L	626	Von Duprin
1	Ea	Rim Cylinder	64-34	626	Sargent
1	Ea	Mortise Cylinder	64-41 X Required Cam	626	Sargent
2	Ea	Cylinder Core	10 6300		Sargent
1	Ea	Surface Closer	SC71 RW/PA	689	Falcon
1	Ea	Kick Plate	8400 10" X 2" LDW	630	Ives
1	Ea	Wall Stop	WS406CCV OR FS438	630	Ives
1	Set	Seals	S88D	DKB	Pem
2	Ea	Card Read Furnished by C Bord			B/O
1	Ea	Power Supply	PS873	GRY	Von Duprin

G. Hardware Set 007

Door numbers: W4-29B

Each to have:

6	**Ea**	**HINGE**	**5BB1HW 4.5 X 4.5 NRP**	**652**	**Ives**
2	**Ea**	**POWER TRANSFER**	**EPT-10**	**689**	**Von Duprin**
1	**Ea**	**MULLION**	**KR4954**	**689**	**Von Duprin**

2	**Ea**	**FIRE EXIT HARDWARE**	**RX98EO-F**	**626**	**Von Duprin**
2	**Ea**	**MORTISE CYLINDER**	**64-41 X REQUIRED CAM**	**626**	**Sargent**
2	**Ea**	**CYLINDER CORE**	**10 6300**		**Sargent**
1	**Ea**	**EXIT TRIM**	**VIP993-MG-FSE-06**	**626**	**SCE**
1	**Ea**	**ASTRAGAL**	**297AS**	**AL**	**Pem**
2	**Ea**	**SURFACE CLOSER**	**SC71 RW/PA**	**689**	**Falcom**
2	**Ea**	**KICK PLATE**	**8400 10" X 1" LDW**	**630**	**Ives**
2	**EA**	**WALL STOP**	**WS406CCV OR FS438**	**630**	**Ives**
1	**Set**	**SEALS**	**S88D**	**DKB**	**Pem**
2	**Ea**	**Card REad Furnished by C Bord**			**B/O**
1	**Ea**	**Power Supply**	**PS873**	**GRY**	**Von Duprin**

DOOR OPERATION: Entrance from outside by valid credential or key override. Free egress from inside always.

END OF SECTION 08710