This master should be used by designers working on Port of Portland construction projects and by designers working for PDX tenants (“Tenants”). Usage notes highlight a few specific editing choices, however the entire section should be evaluated and edited to fit specific project needs.

SECTION 087100 – DOOR HARDWARE

1. GENERAL
	* + 1. DESCRIPTION
				1. This section describes items known commercially as finish or door hardware that are required for swinging doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
				2. This section includes the following:

Hinges.

Pivots.

Lock cylinders and keys.

Lock and latch sets.

Door trim units.

Weatherstripping.

Thresholds.

Weldable boxes.

* + - 1. RELATED WORK SPECIFIED ELSEWHERE
				1. Section 079200, Joint Sealants
				2. Division 9, Finishes
			2. REFERENCES
				1. ADA: Americans with Disabilities Act
				2. ANSI/ BHMA: American National Standards Institute/Builders Hardware Manufacturers Association

ANSI/ BHMA A156.18: American National Standard for Materials and Finishes

ANSI A117.1: Accessible and Usable Buildings and Facilities

* + - * 1. NFPA: National Fire Protection Association

NFPA 101: Life Safety Code

* + - 1. COORDINATION
				1. Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
			2. SUBMITTALS
				1. Product Data: Submit product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
				2. Hardware Schedule: Coordinate hardware schedule with doors, frames and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

Final Hardware Schedule Content: Based on hardware indicated, organize schedule into hardware sets indicating complete designations of every item required for each door or opening. Include the following information:

Type, style, function, size and finish of each hardware item.

Name and manufacturer of each item.

Fastenings and other pertinent information.

Location of each hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.

Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

Mounting locations for hardware.

Door and frame sizes and materials.

Keying information.

Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.

Samples of Finish Hardware: Submit minimum 2-by-4-inch plate samples of each type of finish required, except primed finish. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated in the work, within limitations of keying coordination requirements.

Templates: For doors, frames and other work to be factory-prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

* + - 1. MAINTENANCE
				1. Furnish a complete set of specialized tools and maintenance instructions as needed for the Port’s continued adjustment, maintenance, and removal and replacement of door hardware.
			2. QUALITY ASSURANCE
				1. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.
				2. Supplier Qualifications: Door hardware supplier with warehousing facilities in project’s vicinity and who is or employs an experienced hardware consultant, available during the course of the work to consult with the Contractor and the Port about door hardware and keying.
				3. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
				4. Regulatory Requirements: Comply with provisions of the following:

Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), “Accessibility Guidelines for Buildings and Facilities (ADAAG),” ANSI A117.1, FED-STD-795, “Uniform Federal Accessibility Standards,” as follows:

Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.

Thresholds: Not more than 1/2 inch. Bevel raised thresholds with a slope of not more than 1:2.

NFPA 101: Comply with the following for means of egress doors:

Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.

Thresholds: Not more than 1/2 inch high.

* + - * 1. Preinstallation Conference: Conduct conference at work site. Review methods and procedures related to electrified door hardware including, but not limited to, the following:

Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.

Review sequence of operation for each type of electrified door hardware.

Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment, and facilities needed to make progress and avoid delays.

Review required testing, inspecting, and certifying procedures.

* + - 1. PRODUCT HANDLING
				1. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.
				2. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage it in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packaged in same container.
				3. Inventory door hardware jointly with representatives of hardware supplier and hardware installer unit until each is satisfied that count is correct.
				4. Deliver individually package door hardware items promptly to place of installation (shop or work site).
				5. Provide secure lock-up for door hardware delivered to the project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.
			2. WARRANTY
				1. Warranty Period: Five years from date of substantial completion, unless otherwise indicated.
				2. Special Warranty: Submit written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

Structural failures including excessive deflection, cracking, or breakage.

Faulty operation of operators and door hardware.

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

1. PRODUCTS
	* + 1. PORT-FURNISHED PRODUCTS
				1. Final replacement cores and keys will be furnished and installed by the Port.

Products listed below as “no substitution” have been specifically exempted by the Port’s C&P dept. The Schlage exemption expires March 1, 2026. The LCN and Von-Durpin exemptions expire August 1, 2026.

* + - 1. MANUFACTURERS
				1. Manufacturers shall be the following or pre-bid approved equal unless noted as no substitution.

Hinges: Stanley, McKinney, Hager.

Cylinders: Schlage, no substitution.

Lock and Latches: Schlage, no substitution.

Kick Plates, Stops, and Miscellaneous: Ives, Trimco, Rockwood.

Weldable Box: Keedex.

Seals, Door Bottoms, and Thresholds: Pemko, Reese, Zero.

Closers: LCN, no substitution.

Exit Hardware: Von-Duprin, no substitution.

* + - 1. SCHEDULED HARDWARE
				1. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following:

Manufacturer’s Product Designations: The product designation and name of one manufacturer is listed for each hardware type required for the purpose of establishing minimum requirements. Provide either the product designated or, where more than one manufacturer is specified under the Manufacturers article above for each hardware type, the comparable product of one of the other manufacturers that comply with requirements.

* + - 1. MATERIALS AND FABRICATION
				1. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer’s standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standard for each type hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish optional materials or forming methods for those indicated, except as otherwise specified.
				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 or, if exposed in surfaces of other work, to match finish of this other work as closely as possible.
				4. Provide concealed fasteners for hardware units that are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.
			2. HINGES, BUTTS, AND PIVOTS
				1. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
				2. Screws: Provide Phillips flat-head screws complying with the following requirements.

For metal doors and frames install machine screws into drilled and tapped holes.

Finish screw heads to match surface of hinges or pivots.

* + - * 1. Hinges Pins: Except as otherwise indicated, provide hinge pins as follows:

Out-Swing Doors with Locks: Nonremovable pins.

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

* + - * 1. Number of Hinges: Provide number of hinges indicated but not less than three hinges for door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height.
			1. LOCK CYLINDERS AND KEYING
				1. Equip locks with cylinders with full size interchangeable core pin tumbler inserts. Provide Schlage construction cores SCH 23-030-ICX as temporary inserts for use during the construction period. Upon completion of the work, permanent inserts will be furnished and installed by the Port.
				2. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.
			2. LOCKS, LATCHES, AND BOLTS
				1. Strikes: Provide manufacturer’s standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.

Provide flat lip strikes for locks with three-piece, antifriction latch bolts as recommended by manufacturer.

* + - * 1. Security: Provide BHMA Grade 1 Security listed locksets with fully reversible lock case which does not require removal of lock case cover to re-hand. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

Provide 1/2-inch minimum throw of latch for other bored and preassembled types of locks and 3/4-inch minimum throw of latch for mortise locks. Provide 1-inch minimum throw for all dead bolts.

* + - 1. DOOR TRIM UNITS
				1. Fasteners: Provide manufacturer’s standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
				2. Fabricate protection plates not more than 1-1/2 inch less than door width on hinge side and not more than 1/2 inch less than door width on pull side by height indicated.

Metal Plates: Stainless steel, 0.050 inch (U.S. 18 gauge).

* + - 1. WEATHERSTRIPPING AND SEALS
				1. Provide continuous sound seals on interior doors. Provide non-corrosive fasteners.
			2. THRESHOLDS
				1. Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.
			3. HARDWARE FINISHES
				1. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/ BHMA A156.18 “Materials and Finishes,” including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

USP 600 primed for painting.

US28 628 satin aluminum.

US32D 630 satin stainless steel.

ALUM. 689 aluminum painted.

US26D (BHMA No. 626) dull chrome plated.

1. PRODUCTS
	* + 1. INSTALLATION
				1. Mount hardware units at heights indicated in “Recommended Locations for Builders Hardware for Standard Steel Doors and Frames” by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by the Port.
				2. 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 protection with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate involved.
				3. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
				4. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
				5. Set thresholds in full bed of butylrubber or polyisobutylene mastic sealant complying with requirements specified in Section 079200.
				6. Weatherstripping and Seals: Comply with manufacturer’s instructions and recommendations to the extent installation requirements are not otherwise indicated.
			2. ADJUSTING, CLEANING, AND TRAINING
				1. Adjust and check each are 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.

Where door hardware is installed more than one month prior to acceptance or occupancy of space or area, return to the installation 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.

Clean adjacent surfaces soiled by hardware installation.

Instruct the Port’s personnel in proper adjustment and maintenance of door hardware and hardware finishes.

* + - 1. HARDWARE SCHEDULE

Add hardware schedule as applicable to the project.

* + - * 1. Provide hardware for each door to comply with hardware set numbers indicated in the hardware schedule below. Hardware sets indicate quantity, item, manufacturer and product designation, size, and finish or color, as applicable.

END OF SECTION 087100