

SECTION 087100 – FINISH HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included:
 - 1. Furnish hardware required to complete the work as shown on the drawings and as specified herein;
 - 2. Furnish trim attachments and fastenings, specified or otherwise required, for proper and complete installation.
 - 3. Furnish all items of Finish Hardware specified, scheduled, shown or required herein except those items specifically excluded from this section of the specification.

- B. Related work:
 - 1. Division 1 – General Requirements
 - 2. Division 6 – Rough Carpentry
 - 3. Division 6– Finish Carpentry: Installation of Finish Hardware
 - 4. Division 8 – Steel Doors and Frames
 - 5. Division 8 – Wood Doors
 - 6. Division 8 – Special Doors
 - 7. Division 8 – All Glass Entrances and Storefronts
 - 8. Division 8 – Aluminum Framed Entrances and Storefronts
 - 9. Division 16 – Smoke Detection Systems
 - 10. Division 16 – Security Access Systems

- C. Specific Omissions: Hardware for the following is specified or indicated elsewhere, unless specifically listed in the hardware sets:
 - 1. Cabinet Hardware.
 - 2. Signs, except as noted.
 - 3. Folding partitions, except cylinders where detailed.
 - 4. Sliding aluminum doors
 - 5. Chain link and wire mesh doors and gates
 - 6. Access doors and panels
 - 7. Overhead and Coiling doors

1.2 CODES AND REFERENCES

- A. Comply with the version year adopted by the Authority Having Jurisdiction:
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 80 - Fire Doors and Windows.
 - 4. NFPA 101 - Life Safety Code.
 - 5. NFPA 105 - Installation of Smoke Door Assemblies.
 - 6. Current State Building Codes, Local Amendments.

- B. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 DEFINITIONS

- A. "Finish Hardware": Items required for swinging, sliding and folding doors, except special types of unique and non-matching hardware specified under door and frame Sections of these Specifications.

1.4 SYSTEM DESCRIPTION

- A. Design requirements:
 - 1. Review of hardware requirements:
 - a. Thoroughly review finish hardware schedule, comparing it with the floor plan, door schedule, and door details to verify hardware requirements, quantities, door swings, finishes, and sizes.
 - b. If an inconsistency or error in the proposed construction documents is suspected, the hardware supplier is to bring it immediately to the attention of the Architect. If the quantity of items is questioned, for bidding purposes, assume the higher quantity is required and price accordingly.
 - c. Architect's review of Submittals is for design concept only, and does not relieve the Contractor of the responsibility to furnish sufficient material and functions required for a complete and code-worthy installation. Determination of all quantities is the responsibility of the Contractor.
- B. Performance requirements:
 - 1. Furnish finish hardware complying with the requirements of laws, codes, ordinances and guidelines of governmental authorities having jurisdiction:
 - a. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - b. ICC/IBC - International Building Code.
 - c. NFPA 80 - Fire Doors and Windows.
 - d. NFPA 101 - Life Safety Code.
 - e. NFPA 105 - Installation of Smoke Door Assemblies.
 - f. Current State Building Codes, Local Amendments.

1.5 Submittals:

- A. Hardware Schedule
 - 1. Submit number of Hardware Schedules as directed in Division 1.
 - 2. Follow guidelines established in Door & Hardware Institute Handbook (DHI) Sequence and Format for the Hardware Schedule unless noted otherwise.
 - 3. Schedule will include the following:
 - a. Door Index including opening numbers and the assigned Finish Hardware set.
 - b. Preface sheet listing category only and manufacturer's names of items being furnished as follows:

CATEGORY SPECIFIED		SCHEDULED	
Hinges	Manufacturer A	Manufacturer B	
Lock sets		Manufacturer X	Manufacturer X
Kick Plates	Open	Manufacturer Z	

- c. Hardware Locations: Refer to Article 3.1 B.2 Locations.
- d. Opening Description: Single or pair, number, room locations, hand, active leaf, degree of swing, size, door material, frame material, and UL listing.
- e. Hardware Description: Quantity, category, product number, fasteners, and finish.
- f. Headings that refer to the specified Hardware Set Numbers.

- g. Scheduling Sequence shown in Hardware Sets.
 - h. Product data of each hardware item, and shop drawings where required, for special conditions and specialty hardware.
 - i. Electrified Hardware system operation description.
 - j. "Vertical" scheduling format only. "Horizontal" schedules will be returned "Not Approved."
 - k. Typed Copy.
 - l. Double-Spacing.
 - m. 8 1/2 x 11 inch sheets
 - n. U.S. Standard Finish symbols or BHMA Finish symbols.
- B. Product Data:
- 1. Submit, in booklet form Manufacturers Catalog cut sheets of scheduled hardware.
 - 2. Submit product data with hardware schedule.
- C. Samples:
- 1. Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample, if required, of each type of exposed hardware unit, finished as required and tagged with full description for coordination with schedule.
 - 2. Samples 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. Key Schedule:
- 1. Submit detailed schedule indicating clearly how the Owner's final keying instructions have been followed.
 - 2. Submit as a separate schedule.
- E. Submit to General Contractor/Construction Manager, the factory order acknowledgement numbers for the various hardware items to be used on the project. The factory order acknowledgement numbers shall help to facilitate and expedite any service that may be required on a particular hardware item. General Contractor/Construction Manager shall keep these order acknowledgement numbers on file in the construction trailer.

1.6 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the requirements and the methods needed for proper performance of the work of this Section.
- B. Supplier qualifications:
- 1. A recognized architectural finish hardware supplier.
 - 2. Continuously in business of finish hardware supply for not less than 5 years.
- C. Provide the service of a qualified Architectural Hardware Specialist to:
- 1. Be available for consultation with the Architect at no additional cost to the Owner during progress of construction, and:
 - a. Inspect installation of all finish hardware items;

PARTNERS 15-151
FINISH HARDWARE
087100 - 4

- b. Make all minor adjustments required; and
 - c. Report to the Architect on completeness of the installation.
 2. The hardware consultant may be an employee of the supplier.
- D. Installer qualifications: Employ a competent hardware installer with at least five (5) years experience installing commercial grade hardware similar to that proposed for the Work.
- E. Source limitations: 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.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01620.
- B. Product identification:
1. Tag and mark each item separately in manufacturers unopened package, identifying it by product number and architectural opening number, as listed in the approved Finish Hardware Schedule.
 2. Include instructions, templates, and fasteners needed for installation.
- C. Deliver individually packaged hardware items on a vehicle operated by a direct employee of the Hardware Supplier. Contractor shall immediately, and in the presence of the Hardware Supplier, inventory the contents of the delivery.
- D. Hardware supplier: Furnish finish hardware items directly to the factory or mill for factory-installation, where required.

1.8 PROJECT CONDITIONS

- A. Provide a secure, well lit, dry storage area for the sole purpose of storing finish hardware. Prohibit access to all jobsite personnel, except those employed by the installing contractor.

1.9 WARRANTY

- A. Manufacturer's warranty:
1. Standard manufacturer's warranties apply for products listed in Part 2 products.
 2. Refer to Division 1 for further warranty requirements.
- B. During the warranty period, replace defective work, including labor, materials and other costs incidental to the work. Replace work found to be defective as defined in the General Conditions.
- C. Failures due to defective materials or workmanship to include, but not to be limited to:
1. Failures in operation of any operating component;
 2. Defects which contribute to unsightly appearance, potential safety hazard, or potential untimely failure of the products furnished under this Section.

PART 2 - PRODUCTS

JANUARY 6, 2016 / BIDDING - CONSTRUCTION

2.1 GENERAL

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each finish hardware item is indicated in the Finish Hardware Schedule at the end of this Section.
- B. Product designations:
 - 1. One or more manufacturers are listed for each hardware type required. Product listed is for basis of design. Only products listed in part 2 product descriptions will be allowed for substitution.
- C. ANSI/BHMA designations:
 - 1. Used to describe hardware items, or to define quality or function. Provide products complying with these standards in addition to additional requirements of this Section.
- D. Hand of door: Drawings show direction of slide, swing ("hand") of door leafs.
- E. Hardware: Use hardware manufactured to conform to published templates and, generally, prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

2.2 MATERIALS

- A. Base metals:
 - 1. Manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially-recognized) quality than that specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated.
 - 2. Do not furnish "optional" materials for those indicated, except as otherwise specified.
- B. Fasteners:
 - 1. Furnish Phillips flat-head screws with each hardware item, unless otherwise indicated.
 - 2. Exposed screws: Match finish of hardware (even where noted to be "prepared for paint").
 - 3. Use concealed fasteners for hardware units which are exposed when door is closed, except where no standard units of type specified are available with concealed fasteners.
 - 4. Do not use thru-bolts where bolt head or nut on opposite face would be exposed.
 - 5. Where adequate reinforcement is not feasible, thru-bolting would only be acceptable if through sleeves, or if sex-screw fasteners are used.
- C. Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware. Additionally furnish 2 ea. 609 Cylinder Wrenches.

2.3 MANUFACTURED UNITS, GENERAL

- A. Reference standards:
 - 1. Comply with ANSI A156 current series for each product type.
- B. Hardware finishes:
 - 1. Materials and Finishes Standard: Comply with ANSI A156.18 Finish designations used in schedules are listed, therein.
 - 2. Provide matching finishes for hardware units at each door, unless otherwise indicated.
 - 3. Match the color and texture of hardware items to manufacturer's standard finish for the latchset,

lockset, or push-pull unit.

4. Provide quality of finish, including thickness of plating or coating, composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than that specified or described by referenced standards.

C. Hardware for fire-rated openings:

1. Comply with NFPA 80
2. Tested and listed by Underwriters Laboratory (UL), or Factory Mutual (FM) for type, size and use of door, and complying with requirements of door and door frame label.
3. Provide UL or FM label on door indicating "Fire door to be equipped with fire-exit hardware".
4. Provide UL or FM label on exit device indicating "Fire Exit Hardware".

2.4 PRODUCTS

A. Hinges:

1. Continuous Hinges:
 - a. Continuous shall be Heavy Duty Geared type hinges with 400lb rating.
 - b. ANSI/BHMA A156.26 -Grade 1.
 - c. Fire-rating: "WHI-listed" or "UL-listed" as necessary
 - d. Placement of fire label will be on top of the door at cont. hinge locations.
 - e. Provide hinge filler plates to fill existing hinge preps.
 - f. Undersize doors according to hinge clearance requirements.
 - g. Furnish power transfers as specified.
 - h. Acceptable manufacturer's: International, Stanley, Zero

B. Lock Cylinders and Keying:

1. General:
 - a. Supplier shall meet with the owner and provide a completed key schedule. The key schedule shall include keysets, marks and key schedule corresponding to each opening.
2. Cylinders:
 - a. Type: Mortise or rim-type as required by function of locking device.
 - b. Provide screw on cams or tail piece as required.
 - c. Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.
 - d. Provide solid machined cylinder rings with tension spring to resist wrenching of cylinder. Length, finish and size as required.
 - e. Provide cylinder(s) and core(s) as required by function for each locking device.
3. System:
 - a. Provide cylinders, cores and keys to owners Master Key System.
 - b. Provide a combined core for each locking device as required.
4. Keying:
 - a. Deliver keys and final cores to the hardware installation Contractor for final installation, when directed by the Owner.
 - b. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
 - c. Key material: Nickel silver
 - d. Key quantity:
 - (1) Two (2) change keys for each lock.
 - (2) Two (2) control keys.

- C. Locksets:
1. Mortise Locks
 - a. Comply with ANSI A156.13 - 1987, Grade 1 criteria for mortise locks
 - b. Function: Indicated in the hardware sets.
 - c. Provide appropriate fasteners for lock and strike.
 - d. Trim: Stainless Steel PJEV lever-type equal to PDQ.
 - e. Acceptable products: PDQ MR/MJ Series, MBS R series, SDC 7800 Series
- D. Push Plates & Pull Plates:
1. General:
 - a. ANSI A156.6 Grade 1 criteria.
 2. Description:
 - a. Pull Plate: ADA Flush Pull by door manufacturer.
 - b. Push Plate 6" x 16" x .050 - Solid Stainless Steel
 3. Mounting:
 - a. Mount Pull Plate prior to Push Plate –Pull fasteners shall be concealed under Push Plate.
 4. Acceptable Manufacture: PDQ, Hiawatha, IDC
- E. Door closers:
1. General:
 - a. ANSI A156.4 - 1986 Grade 1 criteria.
 - b. All closers shall be the products of one manufacturer.
 2. Description:
 - a. Full rack-and-pinion type
 - b. Cast Iron Body.
 - c. Hydraulic fluid: Non-gumming and non-freezing.
 - d. Closer body: Non-handed, multi-size spring power.
 - e. With three non-critical V valves and hex key adjustment to independently regulate sweep latch speed and backcheck.
 - f. Provide mounting brackets necessary to clear sound seals and weatherstrip.
 - g. Enclose in a full, molded cover.
 - h. Provide drop plates or special brackets for proper mounting.
 - i. Pressure Relief Valves will NOT be accepted on Door Closers.
 - j. Provide Barrier Free power setting as required by ANSI A117.1
 - k. Where SCS is specified, furnish a Stainless Steel swivel snubber.
Stationary snubbers, rubber grommets and fixed studs will not be accepted.
 3. Acceptable products:
 - a. PDQ 7000 Series, Intl. Door Closers 44CI series, MBS QDC40
- F. Thresholds:
1. General:
 - a. ANSI A156.21 - 1989, Grade 1 criteria.
 - b. Comply with A.D.A. requirements, unless otherwise scheduled.
 2. Description:
 - a. Flat profile
 - b. Installation locations are scheduled.
 - c. Provide templates for thresholds to related door suppliers to coordinate proper undercut.
 3. Acceptable products: Reese, IDC, KN Crowder

PARTNERS 15-151
FINISH HARDWARE
087100 - 8

- G. Miscellaneous Hardware Equipment and Material:
 - 1. General:
 - a. Provide items and types as specified.

2.5 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

2.6 HARDWARE FINISHES

- A. General:
 - 1. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible and except as otherwise indicated.
 - 2. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening.
 - 3. 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.
 - 4. Provide finishes matching those established by BHMA or, if none established, match the Architect's sample.
 - 5. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than that specified for the applicable units of hardware by referenced standards.
 - 6. Finish designations used in schedules and elsewhere listed in ANSI A156.18 "Materials and Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.
- B. Provide the following hardware finishes, unless otherwise scheduled:
Dull Chrome, Stainless Steel, and Aluminum color pallet.
- C. Base material: Manufacturer's standard high-carbon steel, brass, or bronze.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 INSTALLATION

- A. General:
1. Install each item in its proper location firmly anchored into position, level and plumb, and in accordance with the manufacturer's recommendations.
 2. Hanging, hardware heights, locations, and degree of opening swing are indicated in the Drawings and Finish Hardware Schedule.
 3. Mount finish hardware units:
 - a. At recommended heights and locations as shown in approved finish hardware schedule, complying with requirements of the A.D.A., and pertinent provisions of the Building Code.
 - b. To function at proper degree of opening of doors as indicated on approved finish hardware schedule.
 - c. By manufacturer's template.
 - d. Prior to final finishing of the door. Remove hardware to allow finishing of door, and permanently reinstall hardware upon completion of finishing operation.
 3. Reinforce, where necessary, the substrate to assure proper attachment.
 4. Drill and countersink units which are not factory-prepared for anchorage fasteners.
 5. Space fasteners and anchors in accordance with industry standards.
 6. Provide hinge filler plates to fill existing hinge preps.
 7. Patch and repair any hinge, lock, closer or miscellaneous hardware preps on existing frames prior to hanging door and mounting new hardware.
- B. Installing closers:
1. Mount closers per manufacturer's template, and secure the Architect's approval of the closer installation.
 2. The Contractor will be required to **REPLACE** doors onto which closers are improperly mounted at no additional cost to the Owner. Repair or patching of such doors will not be acceptable.
- C. Installing Stops: Install all wall stops into reinforced wall or stud. Projection type wall stops should be mounted 80" from finish floor, with sloped portion of the stop facing up / flat side down. Install floor stops out of the way foot traffic at a height high enough to accommodate any ramp or uneven floor condition.
- D. Installing thresholds at exterior doors: Set in full bed of butyl-rubber, or polyisobutylene mastic sealant.

3.4 FIELD QUALITY CONTROL

- A. Inspection of final hardware installation: The Contractor, hardware suppliers, and Architectural Hardware Consultant (AHC) shall thoroughly check the quality of the installation and the functionality of each unit of finish hardware at all openings in the Work. The Hardware Supplier shall forward a detailed written report of all operational or installation deficiencies to the Architect and Contractor.

3.5 CLEANING AND ADJUSTING

- A. Check and adjust each item of hardware and each door upon completion of final installation. Verify proper function, and replace units which cannot be made to operate freely and smoothly, as intended for the application.

PARTNERS 15-151
FINISH HARDWARE
087100 - 10

- B. Clean adjacent surfaces soiled by hardware installation.

3.6 FINISH HARDWARE SCHEDULE

Hardware Set 1 -Single w/ Classroom Deadbolt & Pull [Lock / Unlock] + Closer Stop

1 ea	Continuous Hinge IDCA110HD	AL
1 ea	Classroom Deadbolt MJ134 -SF7	32D
1 ea.	ADA Flush Pull by Door Manufacturer	AL
1 ea	Push Plate 965	32D
1 ea	Closer 7101 BC SCS (Push side mount)	AL
1 ea	Threshold S205A	AL
1 set	Weatherstrip & Sweep by Door and Frame Manufacturer	AL
1 ea	Rain Drip R199A	AL

Hardware Set 2 -Single w/ Deadbolt Entry Lockset [Lock / Unlock] + Closer Stop

1 ea	Continuous Hinge IDCA110HD	AL
1 ea	Deadbolt Entry Lockset MR 162 PJEW -SF7	32D
1 ea.	SFIC Core -By Owner	26D
1 ea	Closer 7101 BC SCS (Push side mount)	AL
1 ea	Threshold S205A	AL
1 set	Weatherstrip & Sweep by Door and Frame Manufacturer	AL
1 ea	Rain Drip R199A	AL

END OF SECTION 087100