

## SECTION 08710

### Door Finish Hardware

#### PART 1 – GENERAL

##### 1.01 SUMMARY

- A. Section includes hardware for doors specified in “Hardware Sets”.
- B. Related Divisions:
  - 1. Division 03 Concrete
  - 2. Division 06 Rough & Finish Carpentry
  - 3. Division 07 Joint Sealants
  - 4. Division 08 Openings
  - 5. Division 09 Finishes
  - 6. Division 10 Specialties

##### 1.02 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
  - 1. ANSI/BHMA A156.1 Butts & Hinges (2016)
  - 2. ANSI/BHMA A156.2 Bored & Preamsembled Locks & Latches (2017)
  - 3. ANSI/BHMA A156.3 Exit Devices (2020)
  - 4. ANSI/BHMA A156.4 Door Controls – Closers (2019)
  - 5. ANSI/BHMA A156.5 Cylinders and Input Devices for Locks (2020)
  - 6. ANSI/BHMA A156.6 Architectural Door Trim (2015)
  - 7. ANSI/BHMA A156.7 Template Hinge Dimensions (2016)
  - 8. ANSI/BHMA A156.8 Door Controls – Overhead Stops and Holders (2015)
  - 9. ANSI/BHMA A156.12 Interconnected Locks & Latches (2018)
  - 10. ANSI/BHMA A156.13 Mortise Locks & Latches (2017)
  - 11. ANSI/BHMA A156.18 Materials & Finishes (2020)
  - 12. ANSI/BHMA A156.21 Thresholds (2019)
  - 13. ANSI/BHMA A156.22 Door Gasketing Systems (2017)
  - 14. ANSI/BHMA A156.26 Continuous Hinges (2017)
  - 15. ANSI/BHMA A156.28 Keying Systems (2018)
- B. International Code Council/American National Standards Institute (ICC/ANSI)/ADA:
  - 1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities.
- C. Door and Hardware Institute (DHI):
  - 1. DHI Publication – Abbreviations and Symbols (2019).
  - 2. DHI Publication – Installation Guide for Doors and Hardware (2020).
  - 3. DHI Publication – Sequence and Format of Hardware Schedule (2019).
- D. National Fire Protection Agency (NFPA):
  - 1. NFPA 70 National Electrical Code.
  - 2. NFPA 80 Standard for Fire Doors and Other Opening Protectives.
  - 3. NFPA 105 Standard for the Installation of Smoke Door Assemblies.

##### 1.03 SUBMITTALS

- A. Submit in accordance with Conditions of the Contract and Division 01 Administrative Requirements and Submittal Procedures Section.
- B. Shop Drawings:
  - 1. Schedule hardware in vertical format using the DHI publication Sequence and Formatting for the Hardware Schedule.

2. Include abbreviations and symbols page to include manufacturers' abbreviations, finish code descriptions, and fastener abbreviations including descriptions according to the DHI publication Abbreviations and Symbols.
3. Detail headings referencing the Architect's heading, opening number, locations, fire rating, handing, degree of opening, and description of the opening elements. Include Voltage, amperage, and operational descriptions for openings that have electrified hardware.
4. Coordinate final door hardware schedule with doors, frames, and related work listing proper sizing of hardware, addressing door thickness, handing, function, mounting accessories, and finish of hardware.
5. List related door devices specified in other Sections for each opening.
6. Architectural Hardware Consultant (AHC), as certified by DHI, who will affix seal attesting to completeness and correctness, including the review of the hardware schedule prior to submittal.

C. Product Data:

1. Furnish manufacturers' catalog sheets on design, grade, and function of items listed in hardware schedule. Submit only relevant information and circle or highlight the technical information including: model numbers, sizing information, voltage and amperage requirements, options and accessories required, means of fastening, listings of fire-rated applications, and finishes.

E. Templates:

1. Within fourteen days of receiving approved door hardware submittals submit complete list of templates for each hardware item to the opening manufacturers and the installers. Include detailed lists of the hardware location requirements for mortised and surface applied hardware.

F. Closeout Submittals: Include the following information as well as highlight and flag fire rated openings for annual inspections:

1. Cover page with required information:
  - a. Project name
  - b. Hardware supplier's name and contact information.
  - c. Date of substantial completion.
2. Final record hardware schedule.
3. Product Data.
4. Keying Schedule.
5. Operating and Maintenance Manual.
6. Warranty Information.

#### 1.04 QUALITY ASSURANCE

- A. Hardware supplier shall employ an Architectural Hardware Consultant (AHC) as certified by DHI and a member of the seal program who will be available at reasonable times during course of work for Project hardware consultation.
- B. Where openings are required to be accessible door hardware shall conform to ICC/ANSI A117.1.
- C. Fire Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware complying with NFPA 80 that are listed and/or labeled by a qualified testing agency for fire-protection ratings indicated.
- D. Smoke and Draft Control Door Assemblies: Where smoke and draft control doors are required, provide door hardware that meets requirements of assemblies in compliance with NFPA 105.
- E. Door hardware certified to ANSI/BHMA standards as noted, manufacturer must participate and be listed in BHMA Certified Products Directory.
- F. Substitution requests shall be submitted in compliance with Division 01: create a comparison chart that includes the testing information as well as the warranty for both the specified product and the proposed substitution. Include the reason for requesting the substitution, clear catalog copy highlighting the proposed product and options, compliance statement, technical data, product warranty and lead time, to show how the proposed can meet or exceed established level of design, function, and quality.
  1. Items listed with no substitute manufacturers have been requested by the Owner to meet existing standard and will not be reviewed for substitution unless the product is no longer available.

G. Meetings: Comply with requirements in Division 01 Section "Project Meetings."

1. Keying Meeting

- a. Within fourteen days of receiving approved door hardware submittals, contact Owner to establish a keying conference. Include keying meeting decisions into final keying schedule submittal after reviewing the following, but not limited to:
  - i. Function of the building, flow of traffic, individual area's purpose, and degree of security.
  - ii. Lock functions and operation.
  - iii. Preliminary key system schematic diagram.
  - iv. Verify existing keyway(s), and/or proposed keyway(s)
  - v. Visual key and cylinder identification
  - vi. Quantity of keys required including master level keys, change keys, and keys per lock.
  - vii. Review the key control system.
  - viii. Determine the recipient and contact information for the delivery of keys and accessories.

2. Pre-installation Meeting

- a. Convene meeting within fourteen days of receiving approved door hardware submittals. Participants from all affected buildings trades shall attend. Minimum participants should include: Contractor, installer, material supplier, and manufacturer representatives.
- b. Inspect and discuss preparatory work performed by other trades.
- c. Include in-conference decisions regarding proper installation methods and procedures for receiving and handling hardware.
- d. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- e. Review required testing, inspecting, and certifying procedures.

H. Installer Qualifications: Specialized in performing installation of this Section and have five years minimum documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Pack each item complete with necessary parts and fasteners in manufacturer's original packaging.
- B. Mark hardware that is not bulk packed with architect's opening number, hardware set number, and item number for each type of hardware. Include keyset symbols and corresponding hardware component for keyed products. Mark hardware that is bulk packed with manufacturers' part number and reference all hardware sets associated.
- C. Deliver hardware to the job site according to the phasing agreed upon in the pre-installation meeting. Inventory the delivery with the supplier's assistance. Immediately note shortages and damages on the shipping receipts and bill of lading. Coordinate replacement or repair with the supplier.
- D. Deliver permanent keys, cores, and related accessories directly to Owner via registered mail or overnight package service. Establish the instructions for delivery to Owner at "Keying Conference."
- E. Provide a clean, dry, and secure room for hardware delivered. Shelve hardware off the floor and with larger items of hardware stored on pallets. Arrange locksets and keyed cylinders by opening number. Organize the balance of hardware by brand, model of hardware, and hardware set number. Leave the door markings of the hardware visible for installers.
- F. Waste Management and Disposal: Separate waste materials for use or recycling in accordance with Division 01.

1.06 WARRANTY

- A. General Warranty: Comply Division 01 for Warranty requirements.
- B. Special Warranty: Warranties specified in this article will not deprive Owner of other rights.
  1. Ten years for manual door closers.
  2. Five years for locks.
  3. Five years for exit devices.

1.07 MAINTENANCE

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

## PART 2 – PRODUCTS

### 2.01 MATERIALS

A. General:

1. Produce hardware units of basic metal and forming method using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified within this specification section for applicable hardware units for finish designations indicated.

B. Fasteners:

1. Furnish screws for installation with each hardware item. Use only fasteners that are furnished by the hardware manufacturer to meet the manufacturer's templating requirements, warranty and NFPA 80 requirements.
2. Provide Phillips flat-head screws except as otherwise indicated.
3. Finish exposed screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
4. Use machine screws with lead expansion shields at hardware mounting to masonry walls and floors.
5. Wood screw with plastic anchors at drywall applications without reinforcement and wood screws at applications with reinforcements.
6. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.
  - a. 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.
  - b. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex nut fasteners.
7. At exterior openings furnish stainless-steel fasteners for exposed fasteners, for example thresholds and screw-applied weatherstripping.

### 2.02 CONVENTIONAL HINGES

- A. Hinges, electric hinges, and self-closing hinges of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Products to be certified and listed by the following:

1. Butts and Hinges: ANSI/BHMA A156.1.
2. Template Hinge Dimensions: ANSI/BHMA A156.7.
3. Self-Closing Hinges: ANSI/BHMA A156.17.

C. Butt Hinges:

1. Hinge weight and size unless otherwise indicated in hardware sets:
  - a. Doors up to 36" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .134" and a minimum of 4-1/2" in height.
  - b. Doors over 36" wide up to 48" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .145" and a minimum of 5" in height.
  - c. Doors greater than 1-3/4" thick provide hinges with a minimum thickness of .190" and a minimum of 5" in height.
  - d. Width of hinge is to be minimum required to clear surrounding trim.
  - e. Doors considered to be low to medium frequency use would require standard weight hinges and medium to high frequency use would require heavy weight hinges.
2. Base material unless otherwise indicated in hardware sets:
  - a. Exterior Doors: 304 Stainless Steel, Brass or Bronze material.
  - b. Interior Doors: Steel material.
  - c. Fire Rated Doors: Steel or 304 Stainless Steel materials.
  - d. Stainless Steel ball bearing hinges to have stainless steel ball bearings. Steel ball bearings are unacceptable.
3. Quantity of hinges per door unless otherwise stated in hardware sets:

- a. Doors up to 60" in height provide 2 hinges.
  - b. Doors 60" up to 90" in height provide 3 hinges.
  - c. Doors 90" up to 120" in height provide 4 hinges.
  - d. Doors over 120" in height add 1 additional hinge per each additional 30" in height or fraction thereof.
  - e. Dutch doors provide 4 hinges up to 120" in height and 1 additional per each additional 30" in height or fraction thereof.
4. Hinge design and options unless otherwise indicated in hardware sets:
- a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
  - b. Out-swinging lockable and access-controlled doors are required to have Non-Removable Pins (NRP) to prevent removal of pin while door is in closed position.
  - c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
- D. Acceptable Manufacturers:
1. Hager
  2. PBB
  3. McKinney

#### 2.03 ALUMINUM GEARED CONTINUOUS HINGES

- A. Continuous hinges of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Products to be certified and listed by ANSI/BHMA A156.26 Grade 1.
- C. Determine final model numbers and accessories required using the following criteria:
1. Door inset in relation to the frame face.
  2. Door thickness and weight.
  3. At fire rated openings provide hinges that carry a UL certification, up to and including 90-minute applications for wood doors and up to 3-hour applications for metal doors and provide studs as required by the manufacturer's listings.
  4. Provide heavy-duty hinges for high frequency and exterior applications.
  5. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
  6. Size length of hinge to equal the actual door height unless otherwise stated in hardware sets.
- D. Material and Design:
1. Base material: Anodized aluminum manufactured from 6063-T6 material; unexposed working metal surfaces be coated with TFE dry lubricant.
  2. Bearings:
    - a. Continuous hinges are to have a minimum spacing between bearings of 2-9/16". Typical door from 80" to 84" in height to have a minimum of 32 bearings.
- E. Acceptable Manufacturers:
1. Hager
  2. National Guard Products
  3. Select

#### 2.04 MANUAL FLUSH BOLTS

- A. Flush bolts of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Manufacturer to be listed by the following: Auxiliary Hardware: ANSI/BHMI A156.16.
- C. Labeled openings: Provide automatic or constant latching flush bolts per hardware schedule for inactive leaf of pairs of doors. Provide dust proof strikes for bottom bolt.

D. Non-Labeled openings: Provide two flush bolts for inactive leaf of pairs of doors per hardware schedule. Provide extension rods so that the center line of the top flush bolt is not more than 78” above the finish floor. Provide dust proof strike from bottom bolt.

E. Acceptable Manufacturers:

Hager
Rockwood
Trimco

2.05 CYLINDRICAL STANDARD DUTY CYLINDRICAL LOCKS AND LATCHES

A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:

1. ANSI/BHMA A156.2 Series 4000 Certified to Grade 2.
2. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48” in width and up to 96” in height.
3. UL10C/UBC 7-2 Positive Pressure Rated.

C. Lock and latch function numbers and descriptions of manufacturer’s series as listed in hardware sets.

D. Material and Design:

1. Lock and latch chassis to be zinc dichromate for corrosion resistance.
2. Keyed functions to be of a freewheeling design to help resist against vandalism.
3. Non-handed, field reversible.
4. Thru bolt mounting with no exposed screws.
5. Levers, zinc cast and plated to match finish designation in hardware sets.
6. Roses made of wrought brass or stainless-steel material.

E. Latch and Strike:

1. Stainless steel latch bolt with minimum of 1/2” throw and deadlocking for keyed and exterior functions. Provide 3/4” latch bolt for pairs of fire-rated doors where required by door manufacturer. Standard backset to be 2-3/4” and adjustable faceplate to accommodate a square edge door or a standard 1/8” beveled edge door.
2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4” x 4-7/8” with proper lip length to protect surrounding trim.

F. Options:

1. Doors requiring lead line protection – provide locks with 1/16” lead applied to lock and 1/16” lead wrapped around latch bolt.
2. Provide knurled levers on entry side of doors that are potentially dangerous to visually impaired persons.

G. Acceptable Manufacturers:

Hager
Schlage
Best

2.06 MORTISE HEAVY DUTY MORTISE LOCKS AND LATCHES

A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:

1. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
2. UL/cUL Labeled and listed up to 3 hours for single doors up to 48” in width and up to 96” in height.
3. UL10C/UBC 7-2 Positive Pressure Rated.
4. ICC/ANSI A117.1.

C. Lock and latch function numbers and descriptions of manufacturer’s series as listed in hardware sets.

D. Material and Design:

1. Lock cases from fully wrapped, 12-gauge steel, zinc dichromate for corrosion resistance.
2. Non-handed, field reversible without opening lock case.
3. Break-away spindles to prevent unlocking during forced entry or vandalism.
4. Levers, zinc cast, forged brass or stainless steel and plated to match finish designation in hardware sets.
5. Sectional Roses, solid brass or stainless-steel material and have a minimum diameter of 2-7/16".
6. Armor fronts, self-adjusting to accommodate a square edge door or a standard 1/8" beveled edge door.

E. Latch and Strike:

1. Stainless steel latch bolt with minimum of 3/4" throw and deadlocking for keyed and exterior functions.
2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4" x 4-7/8" with proper lip length to protect surrounding trim.
3. Deadbolts to be 1-3/4" total length with a minimum of a 1" throw and 3/4" internal engagement when fully extended and made of stainless-steel material.

F. Acceptable Manufacturers:

Hager
Best
Sargent

## 2.07 INTERCONNECTED LOCKS AND LATCHES

A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:

1. ANSI/BHMA A156.12 Series 5000 Certified to Grade 2.
2. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48" in width and up to 96" in height.
3. UL10C/UBC 7-2 Positive Pressure Rated.
4. ICC/ANSI A117.1

C. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware sets.

D. Material and Design:

1. Lock and latch chassis to be zinc dichromate for corrosion resistance.
2. Keyed functions to be of a freewheeling design to help resist against vandalism.
3. Non-handed, field reversible.
4. Levers, zinc cast and plated to match finish designation in hardware sets.
5. Roses, solid brass or stainless-steel material and have a minimum diameter of 2-1/2".

E. Acceptable Manufacturers:

Hager
Schlage
Sargent

## 2.08 EXIT DEVICES

A. Exit Devices of one manufacturer as listed for continuity of design and consideration of warranty. Touchpad type finish to match balance of door hardware.

B. Standards: Manufacturer to be certified and/or listed by the following:

1. BHMA Certified ANSI A156.3 Grade 1.
2. UL/cUL Listed for up to 3 hours for "A" labeled doors.
3. UL10C/UBC 7-2 Positive Pressure Rated.
4. UL10B Neutral Pressure Rated.
5. UL 305 Listed for Panic Hardware.
6. 2007 Florida Building Code Certification Number: FL9481.1.

C. Material and Design:

1. Provide exit devices with actuators that extend a minimum of one-half of door width.

2. Where trim is indicated in hardware sets provide the lever design to match design of lock levers.
3. Exit device to mount flush with door.
4. Latch bolts:
  - a. Rim device – 3/4” throw, Pullman type with automatic dead-latching, stainless steel
  - b. Surface vertical rod device – Top 1/2” throw, Pullman type with automatic dead-latching, stainless steel. Bottom 1/2” throw, Pullman type, held retracted during door swing, stainless steel.
5. Fasteners: Wood screws, machine screws, and thru bolts.

D. Lock and Latch Functions: Function numbers and descriptions of manufacturer’s series and lever styles indicated in door hardware sets.

E. Acceptable Manufactures:

Hager
Von Duprin
Sargent

## 2.09 CYLINDERS AND KEYING

A. Cylinders of one manufacturer as listed for continuity of design and consideration of warranty.

B. Products to be certified and listed by the following:

1. Auxiliary Locks: ANSI/BHMA A156.5

C. Cylinders:

1. Provide cylinders matched to the types required for hardware that has a locking function and for keyed electronic functions. Furnish with appropriate collars, cams, and tailpieces to fit and operate associated hardware. Stacking collars is not acceptable, a single collar of proper size is required.
2. Manufacturer’s standard tumbler type six-pin conventional cylinder.
3. Provide concealed key control (CKC) at cylinder by stamping or permanently marking the keyset symbol in a location on the cylinder that is concealed when installed.

D. Keying:

1. Provide a new factory registered key system.
2. Provide a bitting list to Owner of combinations as established and expand to twenty-five percent for future use or as directed by Owner.
3. Keys to be shipped directly to the Owner’s Representative as established during the keying conference.
  - a. Package the keys in individual envelopes, grouped by keyset symbol, and label envelopes with project name, factory registry number, and keyset symbol.
4. Stamp large bow key blanks with visual key control (keyset symbol) and “Do Not Duplicate”.
5. Provide construction keyed cylinders as required per the keying meeting.
6. Single seven-pin key will operate both conventional cores and SFIC small format interchangeable cores.

E. Acceptable Manufacturers:

Hager
Schlage
Sargent

## 2.10 PUSH/PULL PLATES AND BARS

A. Push/Pull plates and bars of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer to be certified by the following:

1. Architectural Door Trim: ANSI/BHMA A156.6.
2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

C. Push plates: .050” thick, square corner and beveled edges with countersunk screw holes. Width and height as stated in hardware sets.



D. Acceptable Manufacturers:

Hager
Rockwood
Trimco

E. Pull Plates: .050" thick, square corner and beveled edges. Width and height as stated in hardware sets, 1" diameter pull, with clearance of 2-1/2" from face of door.

F. Acceptable Manufacturers:

Hager
Rockwood
Trimco

2.11 CLOSERS

A. Closers of one manufacturer as listed for continuity of design and consideration of warranty. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.

B. Standards: Manufacturer to be certified by the following:

1. BHMA Certified ANSI A156.4 Grade 1.
2. ADA Complaint ANSI A117.1.
3. UL/cUL Listed up to 3 hours.
4. UL10C Positive Pressure Rated.
5. UL10B Neutral Pressure Rated.

C. Material and Design:

1. Provide aluminum or cast iron, as specified, non-handed bodies with full plastic covers.
2. Closers will have separate staked adjustable valve screws for latch speed, sweep speed, and backcheck.
3. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting.
4. Double heat-treated steel, tempered springs.
5. Precision machined heat-treated steel piston.
6. Triple heat-treated steel spindle.
7. Full rack and pinion operation.

D. Mounting:

1. Out-swing doors surface parallel arm mount closers except where noted on hardware schedule.
2. In-swing doors surface regular arm mount closers except where noted on hardware schedule.
3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

E. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements.

1. Interior hinged openings: 5.0 lbs.
2. Fire-rated and exterior openings are to be adjusted to have minimum opening force allowable by authority having jurisdiction.

F. Fasteners: Provide self-reaming, self-tapping wood and machine screws, and sex nuts and bolts for each closer.

G. Acceptable manufacturers:

Hager
Norton
Sargent

2.12 PROTECTIVE TRIM

- A. Protective trim of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Size of protection plate: single doors, size two inches less door width (LDW) on push side of door, and one inch less door width on pull side of door. For pairs of doors, size one inch less door width (LDW) on push side of door, and 1/2 inch on pull side of door. Adjust sizes to accommodate accompanying hardware, such as, edge guards, astragals, and others.
  - 1. Kick Plates 10" high or sized to door bottom rail height.
  - 2. Mop Plates 4" high.
  - 3. Armor Plates 36" high.
- C. Products to be certified and listed by the following:
  - 1. Architectural Door Trim: ANSI/BHMA A156.6.
  - 2. UL.
- D. Material and Design:
  - 1. 0.050" gage stainless steel.
  - 2. Corners square, polishing lines, or dominant direction of surface pattern so they run across door width of plate.
  - 3. Bevel top, bottom, and sides uniformly leaving no sharp edges.
  - 4. Countersink holes for screws. Space screw holes so they are no more than eight inches CTC, along a centerline not over 1/2" in from edge around plate. End screws maximum of 0.53" from corners.
- E. UL label stamp required on protection plates when top of plate is more than 16 inches above bottom of door on fire rated openings. Verify door manufacturer's UL listing for maximum height and width of protection plate to be used.

F. Acceptable Manufacturers:

Hager
Trimco
Burns

2.13 STOPS AND HOLDERS

- A. Stops and holders of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls have stainless steel machine screws and lead expansion shields.
- C. Products to be certified and listed by the following:
  - 1. Auxiliary Hardware: ANSI/BHMA A156.16.
- D. Acceptable Manufacturers:

Hager
Rockwood
Burns
- E. Overhead Stops and Holders: Provide overhead stops and holders for doors that open against equipment, casework sidelights and other objects that would make wall stops/holders and floor stops/holders inappropriate. Provide sex bolt attachments for mineral core wood door applications.
- F. Products to be certified and listed by the following:
  - 1. Overhead Stops and Holders: ANSI/BHMA A156.8 Grade 1.

G. Acceptable Manufacturers:

Hager
Glynn Johnson
Sargent

2.14 THRESHOLDS

- A. Thresholds of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Set thresholds for exterior and acoustical openings in full bed of sealant with lead expansion shields and stainless-steel machine screws complying with requirements specified in Division 07 Section "Joint Sealants: Notched in field to fit frame by hardware installer. Refer to Drawings for special details.
- C. Standards: Manufacturer to be certified by the following:
  - 1. Thresholds: ANSI/BHMA A156.21.
  - 2. American with Disabilities Act Accessibility Guidelines (ADAAG).

D. Acceptable Manufacturers:

Hager
K.N. Crowder
Reese

2.15 DOOR GASKETING AND WEATHERSTRIP

- A. Door gasketing and weatherstrip of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide noncorrosive fasteners for exterior applications.
  - 1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
  - 2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
  - 3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
  - 4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
  - 5. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4" beyond width of door.
- C. Products to be certified and listed by the following:
  - 1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.
  - 2. BHMA certified for door sweeps, automatic door bottoms, and adhesive applied gasketing.
- D. Smoke-Labeled Gasketing: Comply with NFPA 105 listed, labeled, and acceptable to Authorities Having Jurisdiction, for smoke control indicated.
  - 1. Provide smoke-labeled gasketing on 20-minute rated doors and on smoke rated doors.
- E. Fire-Rated Gasketing: Comply with NFPA 80 listed, labeled, and acceptable to Authorities Having Jurisdiction, for fire ratings indicated.
- F. Refer to Section 08 1416 Wood Doors for Category A or Category B. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required.

G. Acceptable Manufacturers:

Hager
K.N. Crowder
Reese

2.16 SILENCERS

- A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.
- B. Products to be certified and listed by the following:
  - 1. Auxiliary Hardware: ANSI/BHMA A156.16

C. Acceptable Manufacturers:

Hager
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Rockwood
Trimco

## 2.17 FINISHES

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within 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 range of approved samples.
- B. Comply with base material and finish requirements indicated by ANSI/BHMA A156.18 designations in hardware schedule.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Examine doors and frames, with installers present, for compliance with requirements for installation tolerances, labeled fire-rated construction, wall and floor construction, and other conditions affecting performance.
- B. Where hardware will be installed directly on walls inspect applications for blocking material of sufficient type and size for hardware.
- C. Notify Architect via a prepared written report and endorsed by installer of any discrepancies between the door schedule, door types, drawings, and scheduled hardware. List conditions detrimental to application, to the proper and timely completion of the work and performance of the hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

### 3.02 INSTALLATION

- A. Install hardware using manufacturers' recommended fasteners and installation instructions, at height locations and clearance tolerances that comply with:
  - 1. NFPA 80
  - 2. NFPA 105
  - 3. ICC/ANSI A117.1
  - 4. DHI Publication – Installation Guide for Doors and Hardware
  - 5. Approved shop drawings
  - 6. Approved hardware schedule
- B. Install soffit mounted gaskets prior to other soffit mounted hardware ensuring a continuous seal around the perimeter of the opening without cutting or notching.
- C. Locate surface mounted door closers on stairwell side of stair doors, interior side of exterior openings, or on the room side of openings, unless it is a sterile room.
- D. Locate wall mounted bumper to contact the operating trim. Verify that pushbuttons of locksets do not contact the stop and inadvertently lock the door.
- E. Mount armor, mop, and kick plates flush with the bottom of the door and centered horizontally on the door.
- F. Notch thresholds with no larger than a 1/32-inch gap matching the frame profile. Set in a full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants" forming a tight seal between threshold and mounting surface. Caulk and seal the entire perimeter to prevent water leakage. Remove excess sealants immediately and clean the area thoroughly.
- G. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location.

### 3.03 FIELD QUALITY CONTROL

- A. Schedule a final walk through to inspect hardware installation ten (10) business days before final acceptance of the Owner. Visually inspect for proper fasteners and verify that doors open, close, latch properly, and that openings are installed to meet NFPA 80 and ANSI A117.1 requirements. Correct deficiencies, including missing hardware immediately. Provide a written report detailing discrepancies of each opening within five (5) business days of the walk through.
- B. Prior to receiving certificate of occupancy have doors inspected by a Certified Fire and Egress Door Assembly Inspector (CFDAI), as certified by Intertek (ITS), submit a written report to the Owner and Contractor. Doors failing inspection must be adjusted, modified, or replaced to be within appropriate code requirements without delay.

3.04 ADJUSTMENT, CLEANING, AND DEMONSTRATING

- A. Prior to final adjustments, the HVAC system must be completed and balanced. Test that all openings meet ANSI A117.1 for closer opening pressure, closing speed, latching, and hardware operating forces. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application.
- B. Prior to final walk-through inspection, clean adjacent surfaces soiled by hardware installation. Clean finish hardware per manufacturer's instructions after final adjustments have been made. Remove all protection and replace items that cannot be cleaned to manufacturer's level of finish quality.
- C. Demonstration and training will be conducted as per the following sessions. All sessions will be recorded and turned over to the Owner for future use.
  - 1. Hardware Maintenance: Conduct a training class for building maintenance personnel demonstrating the adjustment, operation, and maintenance of ALL hardware. Special tools for finish hardware to be turned over and demonstrated usage at the meeting.
  - 2. Key control system: Train the Owner's designated representative on the key control system demonstrating the permanent file keys, duplicate loaner keys, key receipts, key envelopes, key change identification sheets, bitting lists, tags, and labels. When key management software is provided training will be provided for the setup and usage of the software.

3.05 PROTECTION

- A. Leave manufacturer's protective film intact and, protect exit devices, locks, and surface mounted hardware with kraft paper or bubble wrap. Cover fire labels at painted products that bear a label with magnetic or masking tape. Keep protection in place until time of final cleaning and adjustment.

3.06 HARDWARE SET SCHEDULE

- A. Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, and performance.
  - 1. Review products that may require mounting accessories to meet door, frame, and swing conditions as these final details vary from manufacturer to manufacturer and provide as required.
  - 2. Where additional items of hardware are required for completion of the Work, a written statement of such omission, error, or other discrepancy is required to be submitted to the Architect, prior to bid date for clarification via an addendum.
  - 3. Abbreviations listed below do not appear in the manufacturer's literature, for any other abbreviations refer to manufacturer's literature.:
    - a. LDW = Less than Door Width
    - b. LAR = Length as Required
    - c. QTY = Quantity
    - d. CTC = Centerline to Centerline
    - e. BT = Back-to-Back mounting
    - f. FEC = Flush End Cap

B. Manufacturer List

Code	Manufacturer
	By Others
HA	Hager

Code	Manufacturer
SLCT	Select

C. Option List

Code	Description
ADA Turn	ADA Thumb Turn
H	HANDICAP CLEARANCE (3")

3.07 HARDWARE SCHEDULE

Set #AL 01

Doors: 100, 100A, 103, 104, 104A, 105, 107, 117, 118, 119, 120, 121, 121A, 121B, 121C, 121D, 121E, 121F, 121G

1 Cylinder(s)	3901/3902 as req'd	US26D	HA
1 Balance of Hardware	By Door/Frame Mfr./Supplier		

Set #01

Doors: 123A, 129A, 130

1 Hardware	By Door Mfr./Supplier
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Set #02

Doors: 115, 127

1 Continuous Hinge(s)	SL18HD x LAR	CL	SLCT
1 Exit Device(s)	4501 RIM FEC	US32D	HA
1 Night Latch Exit Trim(s)	45NL AUG	US26D	HA
1 Rim Cylinder(s)	3901	US26D	HA
1 Closer(s)	5100 HDCS	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Threshold	520S N x LAR	MIL	HA
1 Weatherstrip	881S N x LAR	MIL	HA
1 Sweep(s)	750S N x LAR	CLR	HA
1 Rain Drip Cap	810S x LAR	MIL	HA

Hardware set is intended as a guide. Confirm with door and frame manufacturer to ensure all required ratings are met.

Set #03

Doors: 123, 130A

1 Continuous Hinge(s)	SL18HD x LAR	CL	SLCT
1 Corridor Lockset	3856 SECT AUG ADA Turn	US26D	HA
1 Closer(s)	5100 HDCS	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Threshold	520S N x LAR	MIL	HA
1 Weatherstrip	881S N x LAR	MIL	HA
1 Sweep(s)	750S N x LAR	CLR	HA
1 Rain Drip Cap	810S x LAR	MIL	HA

Set #03

Hardware set is intended as a guide. Confirm with door and frame manufacturer to ensure all required ratings are met.

Set #04

Doors: 129, 131

1	Continuous Hinge(s)	SL18HD x LAR	CL	SLCT
1	Storeroom Lockset	3881 SECT AUG ADA Turn	US26D	HA
1	Closer(s)	5100 HDCS	ALM	HA
1	Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1	Threshold	520S N x LAR	MIL	HA
1	Weatherstrip	881S N x LAR	MIL	HA
1	Sweep(s)	750S N x LAR	CLR	HA
1	Rain Drip Cap	810S x LAR	MIL	HA

Hardware set is intended as a guide. Confirm with door and frame manufacturer to ensure all required ratings are met.

Set #05

Doors: 132

2	Continuous Hinge(s)	SL18HD x LAR	CL	SLCT
2	Surface Bolt(s)	276D 12"	US26D	HA
1	Storeroom Lockset	3881 SECT AUG ADA Turn	US26D	HA
1	Overhead Stop(s) Inactive Leaf	7016 SRF	US32D	HA
1	Closer(s) Active Leaf	5100 HDCS	ALM	HA
2	Kick Plate(s)	190S 10" x 1" LDW	US32D	HA
1	Threshold	520S N x LAR	MIL	HA
1	Weatherstrip	881S N x LAR	MIL	HA
2	Sweep(s)	750S N x LAR	CLR	HA
1	Astragal	874S N x LAR	MIL	HA
1	Rain Drip Cap	810S x LAR	MIL	HA

Hardware set is intended as a guide. Confirm with door and frame manufacturer to ensure all required ratings are met.

Set #06

Doors: 123B

3	Hinge(s)	BB1279 4 1/2" x 4 1/2" NRP	US26D	HA
1	Office Lockset	3550 AUG	US26D	HA
1	Closer(s)	5200 HDCS	ALM	HA
1	Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1	Threshold	413S x LAR	MIL	HA
1	Seal	726 x LAR	S	HA
1	Sweep(s)	750S N x LAR	CLR	HA

Set #07

Doors: 124

3	Hinge(s)	BB1279 5" x 4 1/2"	US26D	HA
1	Storeroom Lockset	3580 AUG	US26D	HA
1	Closer(s)	5200	ALM	HA
1	Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1	Convex Wall Stop(s)	232W	US32D	HA
1	Seal	726 x LAR	S	HA

Set #08

Doors: 128

3 Hinge(s)	BB1168 4 1/2" x 4 1/2"	US26D	HA
1 Classroom Lockset	3570 AUG	US26D	HA
1 Closer(s)	5200	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Convex Wall Stop(s)	232W	US32D	HA
1 Threshold	413S x LAR	MIL	HA
1 Seal	726 x LAR	S	HA
1 Sweep(s)	750S N x LAR	CLR	HA

Set #09

Doors: 108

4 Hinge(s)	BB1168 4 1/2" x 4 1/2"	US26D	HA
1 Classroom Lockset	3570 AUG	US26D	HA
1 Closer(s)	5200	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Convex Wall Stop(s)	232W	US32D	HA

Set #10

Doors: 106, 112, 116, 122

4 Hinge(s)	BB1279 4 1/2" x 4 1/2"	US26D	HA
1 Office Lockset	3550 AUG	US26D	HA
1 Concave Wall Stop(s)	236W	US32D	HA
3 Silencers	307D	GREY	HA

Set #11

Doors: 110, 111, 126

4 Hinge(s)	BB1168 4 1/2" x 4 1/2"	US26D	HA
1 Push Plate(s)	30S 8" x 16"	US32D	HA
1 Pull Plate	H 34J 4" x 16"	US32D	HA
1 Closer(s)	5200	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Mop Plate(s)	190S 4" x 1" LDW	US32D	HA
1 Convex Wall Stop(s)	232W	US32D	HA
3 Silencers	307D	GREY	HA

Set #12

Doors: 125

3 Hinge(s)	BB1279 4 1/2" x 4 1/2"	US26D	HA
1 Privacy Set w/ Indicator	3796 AUG	US26D	HA
1 Closer(s)	5200	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Mop Plate(s)	190S 4" x 1" LDW	US32D	HA
1 Convex Wall Stop(s)	232W	US32D	HA
1 Seal	726 x LAR	S	HA



Set #13

Doors: 102, 114

4 Hinge(s)	BB1279 4 1/2" x 4 1/2"	US26D	HA
1 Storeroom Lockset	3580 AUG	US26D	HA
1 Closer(s)	5200	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Convex Wall Stop(s)	232W	US32D	HA
3 Silencers	307D	GREY	HA

Set #14

Doors: 109

4 Hinge(s)	BB1279 4 1/2" x 4 1/2" NRP	US26D	HA
1 Storeroom Lockset	3580 AUG	US26D	HA
1 Closer(s)	5200	ALM	HA
1 Kick Plate(s)	190S 10" x 2" LDW	US32D	HA
1 Convex Wall Stop(s)	232W	US32D	HA
3 Silencers	307D	GREY	HA