

## SECTION 087100 – DOOR HARDWARE

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes:
  - 1. Hardware for fire-rated doors.
  - 2. Lock cylinders for doors with balance of hardware specified in other sections.
  - 3. Thresholds.
  - 4. Weatherstripping and gasketing.
- B. Related Sections include the following:
  - 2. Division 7 Section "Joint Sealants" for setting exterior door thresholds.
  - 3. Division 8 Section "Hollow Metal Doors and Frames" for door hardware, expect as noted in section.
  - 4. Division 8 Section "Aluminum-Framed Entrances and Storefront Systems" for door hardware, expect as noted in section.
  - 5. Division 8 Section "Glazed Aluminum Curtain Walls" for door hardware, expect as noted in section.

#### 1.3 REFERENCE STANDARDS

- A. The following Reference Standards are to be applied to this specification:
  - 6. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
  - 7. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2019.
  - 8. BHMA A156.3 - Exit Devices 2020.
  - 9. BHMA A156.4 - Door Controls - Closers 2019.
  - 10. BHMA A156.5 - Cylinders and Input Devices for Locks 2020.
  - 11. BHMA A156.6 - Standard for Architectural Door Trim 2021.
  - 12. BHMA A156.8 - Door Controls - Overhead Stops and Holders 2021.
  - 13. BHMA A156.13 - Mortise Locks & Latches Series 1000 2022.
  - 14. BHMA A156.16 - Auxiliary Hardware 2018.
  - 15. BHMA A156.18 - Materials and Finishes 2020.
  - 16. BHMA A156.21 - Thresholds 2019.
  - 17. BHMA A156.22 - Standard for Gasketing 2021.
  - 18. BHMA A156.26 - Standard for Continuous Hinges 2021.

19. BHMA A156.28 - Standard for Recommended Practices for Mechanical Keying Systems 2018.
20. BHMA A156.30 - High Security Cylinders 2020.
21. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.
22. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames 2006.
23. DHI (H&S) - Sequence and Format for the Hardware Schedule 2019.
24. DHI (KSN) - Keying Systems and Nomenclature 2019.
25. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames 2004.
26. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors 1993; also in WDHS-1/WDHS-5 Series, 1996.
27. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
28. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
29. ISO 9001 - Quality Management Systems — Requirements 2015.
30. ITS (DIR) - Directory of Listed Products Current Edition.
31. MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests 2019h.
32. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
33. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
34. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
35. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
36. UL (DIR) - Online Certifications Directory Current Edition.
37. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.
38. UL 437 - Standard for Key Locks Current Edition, Including All Revisions.
39. UL 1037 - Antitheft Alarms and Devices Current Edition, Including All Revisions.
40. UL 1610 - Central-Station Burglar-Alarm Units Current Edition, Including All Revisions.
41. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure facility services connections are achieved in an orderly and expeditious manner.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by affected installers and the following:
  1. Architect.
  2. Installer's Architectural Hardware Consultant (AHC).
  3. Hardware Installer.
  4. Owner's Security Consultant.

- D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- E. Keying Requirements Meeting:
  - 1. Attendance Required:
    - a. Owner.
    - b. Architect.
  - 2. Agenda:
    - a. Establish keying requirements.
    - b. Verify locksets and locking hardware are functionally correct for project requirements.
    - c. Verify that keying and programming complies with project requirements.
    - d. Establish keying submittal schedule and update requirements.
  - 3. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
  - 4. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
  - 5. Deliver established keying requirements to manufacturers.

#### 1.5 **SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: A detailed listing that includes each item of hardware to be installed on each door.
  - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
  - 2. Comply with DHI (H&S) using door numbering scheme and hardware set numbers as indicated in Contract Documents.
    - a. Submit in vertical format.
  - 3. Include complete description for each door listed.
- D. Shop Drawings - Electrified Door Hardware: Include diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:

1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
  2. Elevations: Include front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
  3. Diagrams: Include point-to-point wiring diagrams that show each device in door opening system with related colored wire connections to each device.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Supplier's qualification statement.
- I. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- J. Keying Schedule:
1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- K. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- L. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- M. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
1. See Section 016000 - Product Requirements, for additional provisions.

#### 1.6 QUALITY ASSURANCE

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.
- D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

## 1.8 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
  - 1. Closers: Five years, minimum.
  - 2. Exit Devices: Three years, minimum.
  - 3. Locksets and Cylinders: Three years, minimum.

## PART 2 - PRODUCTS

### 2.1 GENERAL REQUIREMENTS

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Closers:
  - 4. Provide door closer on each exterior door, unless otherwise indicated.
  - 5. Provide door closer on each fire-rated and smoke-rated door.
  - 6. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
- D. Overhead Stops and Holders (Door Checks).
  - 1. Provide stop for every swinging door, unless otherwise indicated.
  - 2. Overhead Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop, unless otherwise indicated.
  - 3. Overhead stop is not required if a floor or wall stop has been specified for the door.
- E. Drip Guards: Provide at head of outswinging exterior doors unless protected by roof or canopy directly overhead.
- F. Thresholds:
  - 1. Exterior Applications: Provide at each exterior door, unless otherwise indicated.
- G. Weatherstripping and Gasketing:

1. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
2. Provide door bottom sweep on each exterior door, unless otherwise indicated.

H. Fasteners:

1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
  - a. Aluminum fasteners are not permitted.
  - b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
  - a. Self-drilling (Tek) type screws are not permitted.
3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
4. Provide wall grip inserts for hollow wall construction.
5. Fire-Resistance-Rated Applications: Comply with NFPA 80.
  - a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
  - b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

## 2.2 PERFORMANCE Requirements

A. Provide door hardware products that comply with the following requirements:

1. Applicable provisions of federal, state, and local codes.
  - a. ICC (IBC).
  - b. NFPA 101.
2. Accessibility: ADA Standards and ICC A117.1.
3. Fire-Resistance-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
4. Hardware on Fire-Resistance-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), testing firm acceptable to authorities having jurisdiction.
5. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
7. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
8. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

## 2.3 HINGES

A. Manufacturers: Conventional butt hinges.

1. BEST; dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
2. Allegion: Ives.
3. ASSA ABLOY: McKinney.

B. Properties:

1. Continuous Hinges: As applicable to each item specified.
  - a. Geared Continuous Hinges: As applicable to each item specified.
    - 1) Non-handed.
    - 2) Anti-spinning through-fastener.
    - 3) UL 10C listed for fire-resistance-rated doors.
      - a) Metal Door Installation: Rated up to 90 minutes.
      - b) Wood Door Installation: Rated up to 60 minutes.
    - 4) Sufficient size to permit door to swing 180 degrees

C. Sizes: See Door Hardware Schedule.

1. Hinge Widths: As required to clear surrounding trim.
2. Sufficient size to allow 180 degree swing of door.

D. Finishes: See Door Hardware Schedule.

E. Grades:

1. Continuous Hinges: Comply with BHMA A156.26, Grade 1.

F. Material: Base metal as indicated for each item by BHMA material and finish designation.

G. Types:

1. Continuous Hinges: Include geared hinges.

H. Options: As applicable to each item specified.

1. Continuous Hinges: One per door leaf.
2. Removable power transfer section with Quick Connect Connectors

I. Applications: At swinging doors.

1. Provide non-removable pins at out-swinging doors with locking hardware and all exterior doors.

J. Products:

1. Butt Hinges:
2. Continuous Hinges:
  - a. Aluminum geared hinges.

## 2.4 EXIT DEVICES

### A. Manufacturers:

1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
2. Allegion: Von Duprin 98 Series.
3. ASSA ABLOY: Sargent 80 Series.

### B. Properties:

1. Actuation: Crossbar.
2. Chassis:
  - a. Construction: Investment cast steel, zinc dichromate plated.
  - b. Compatibility: Standard Stile and Narrow Stile doors.
3. Touchpads: 'T' style metal touchpads and rail assemblies with matching chassis covers end caps.
4. Latch Bolts: Stainless steel deadlocking with 3/4 inch (19 mm) projection using latch bolt.
5. Lever Design: Match project standard lockset trims.
6. Cylinder: Include where cylinder dogging or locking trim is indicated.
7. Strike as recommended by manufacturer for application indicated.
8. Sound dampening on touch bar.
9. Dogging:
  - a. Non-Fire-Resistance-Rated Devices: Cylinder 1/4 inch (6 mm) hex key dogging.
  - b. Fire-Resistance-Rated Devices: Manual dogging not permitted.
10. Touch bar assembly on wide style exit devices to have a 1/4 inch (6.3 mm) clearance to allow for vision frames.
11. All exposed exit device components to be of architectural metals and "true" architectural finishes.
12. Handing: Field-reversible.
13. Fasteners on Back Side of Device Channel: Concealed - exposed fasteners not allowed.
14. Vertical Latch Assemblies' Operation: Gravity, without use of springs.
  - a. Latch Bolts: Stainless steel, with 1/2 inch (12.7 mm) throw.

### C. Grades: Complying with BHMA A156.3, Grade 1.

1. Provide exit devices tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.

### D. Standards Compliance:

1. UL Listed for Panic and Fire for Class II Circuitry.

### E. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.

### F. Options:



1. Vandal-Resistant Trim: Heavy-duty lever trim with heavy-duty investment-cast stainless steel components and extra strength shock absorbing overload springs.
  - a. Not requiring resetting.
  - b. Lever design to match locksets and latchsets.
2. Weatherized True Architectural Finish: Provide where indicated in Door Hardware Schedule as 626W.
  - a. Weatherized exterior components to include active case cover, touch bar, device channel, slide channel fillers, vertical rods, latch covers, and device end cap.
    - 1) Base Metal Material: Brass.
    - 2) Plated Finish: Satin nickel and chrome, using a double-dip, two-step process.
  - b. Performance Requirements:
    - 1) BHMA A156.18 Salt Spray Certified using 600 Hours of testing, 3 times longer than the Standard's requirements.
    - 2) MIL-STD-810G 509.6 Salt Fog Certified.
    - 3) MIL-STD-810G 510.6 Sand and Dust Certified.
    - 4) MIL-STD-810G 521.4 Icing or Freezing Rain Certified.
  - c. Compatible non-weatherized electrified options as specified in Door Hardware Schedule.
3. WTS touch bar switch.
4. WALW hardwired exit alarm.

G. Products:

5. 2000.

## 2.5 Removable Mullions

A. Manufacturers:

1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
2. Allegion: Von Duprin.
3. ASSA ABLOY: Sargent.

B. Properties:

1. Rectangular shape 3 inches (76 mm) by 2 inches (51 mm) tubes with minimum 1/8 inch (3.2 mm) wall thickness.
2. Furnished by the same manufacturer as exit devices.
3. Pre-drilled holes for installation of exit device strikes.
4. Spacers: Provide as required for proper installation, based on frame profile and dimensions.

C. Grades: Complying with BHMA A156.3.

D. Materials: Manufacturer's standard for items specified.

1. Top and Bottom Brackets: Investment-cast steel.

- E. Options:
  - 1. Furnish Keyed Removable “KR” feature and corresponding cylinders as specified.
    - a. Mullions capable of being installed without physical key present.
    - b. Physical key required to operate.
- F. Applications: As indicated on drawings and in Door Hardware Schedule.
- G. Products:
  - 1. 822 Series.

## 2.6 LOCK CYLINDERS

- A. Manufacturers:
  - 1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).
  - 2. Substitutions: Not permitted.
- B. Properties:
  - 1. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
    - a. Provide cylinders from same manufacturer as locking device.
    - b. Provide cams and/or tailpieces as required for locking devices.
    - c. Provide cylinders with appropriate format interchangeable cores where indicated.
- C. Grades:
  - 1. Standard Security Cylinders: Comply with BHMA A156.5.
- D. Material:
  - 1. Manufacturer's standard corrosion-resistant brass alloy.
- E. Types: As applicable to each item specified.
  - 1. Standard security small format interchangeable core (SFIC) type cylinders, with seven-pin, 1C - 7-pin cores.
  - 2. High security type cylinders with seven-pin cores.
- F. Applications: At locations indicated in hardware sets, and as follows
  - 1. As required for items with locking devices provided by other sections, including at elevator controls and cabinets.
    - a. When provisions for lock cylinders are referenced elsewhere in the Project Manual to this Section, provide compatible type of lock cylinder, keyed to building keying system, unless otherwise indicated.
- G. Products:

1. Rim/mortise.

## 2.7 DOOR PULLS AND PUSH PLATES

### A. Manufacturers:

1. Trimco: [www.trimcohardware.com/#sle](http://www.trimcohardware.com/#sle).
2. Ives.
3. Rockwood.

### B. Properties:

1. Pull Type: Straight, unless otherwise indicated.
2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
  - a. Edges: Beveled, unless otherwise indicated.

### C. Grades: Comply with BHMA A156.6.

### D. Material: Stainless steel, unless otherwise indicated.

### E. Products:

1. Anti-Vandal Pull at active leaf only.

## 2.8 CLOSERS

### F. Manufacturers:

1. Best: dormakaba Group: [www.dormakaba.com/us-en/#sle](http://www.dormakaba.com/us-en/#sle).
2. Allegion: LCN 4040 XP Series.
3. ASSA ABLOY: Sargent 281 Series.

### G. Properties:

1. Surface Mounted Closers: Manufacturer's standard.
  - a. Construction: One piece cast iron body and tube.
  - b. Maximum Projection from Face of Door: 2-7/16 inches (62 mm).
  - c. Mechanism: Separate tamper-resistant adjusting valves for closing and latching speeds.
    - 1) Include advanced backcheck feature.
  - d. Pinion: Stainless steel.
  - e. Hydraulic Fluid: All-weather type.
  - f. Arm Assembly: Standard for product specified.
    - 1) Material: Steel.
    - 2) Include hold-open, integral stop, or spring-loaded stop feature, as specified in Door Hardware Schedule.
    - 3) Parallel arm to be a heavy-duty rigid arm.

- 4) Where "IS" or "S-IS" arms are specified in hardware sets, if manufacturer does not offer this arm provide a regular arm mount closer in conjunction with a heavy-duty overhead stop equal to a dormakaba 900 Series.
- g. Covers:
  - 1) Type: Standard for product selected.
    - a) Full.
    - b) Full slotted.
  - 2) Material: Plastic.
  - 3) Finish: Painted.
- H. Grades:
  1. Closers: Comply with BHMA A156.4, Grade 1.
    - a. Underwriters Laboratories Compliance:
      - 1) Product Listing: UL (DIR) and ULC for use on fire-resistance-rated doors.
        - a) UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
- I. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.
  1. Devices listed with California Department of Forestry and Fire Protection, Office of the State Fire Marshal.
- J. Types:
  1. Rack-and-pinion, surface-mounted. 1-1/2 inches (38 mm) minimum bore.
- K. Options:
  1. Delayed action, adjustable with an independent valve.
- L. Installation:
  1. Mounting: Includes surface mounted installations.
  2. Mount closers on non-public side of door and stair side of stair doors unless otherwise noted in hardware sets.
  3. At outswinging exterior doors, mount closer on interior side of door.
  4. Provide adapter plates, shim spacers, and blade stop spacers as required by frame and door conditions.
  5. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
- M. Products:
  1. Surface Mounted:
    - a. EHD9000

## 2.9 THRESHOLDS

### A. Manufacturers:

1. National Guard Products, Inc: [www.ngpinc.com/#sle](http://www.ngpinc.com/#sle).
2. Pemko.
3. Reese.

### B. Properties:

1. Threshold Surface: Fluted horizontal grooves across full width.

### C. Grades: Thresholds: Comply with BHMA A156.21.

### D. Types: As applicable to project conditions. Provide barrier-free type at every location where specified.

1. Saddle Thresholds: Without thermal break.
2. Bumper Seal Thresholds with Gasket: Use silicone gaskets.

## 2.10 WEATHERSTRIPPING AND GASKETING

### A. Manufacturers:

1. National Guard Products, Inc: [www.ngpinc.com/#sle](http://www.ngpinc.com/#sle).
2. Reese.
3. Pemko.

### B. Properties:

1. Weatherstripping Air Leakage Performance: Not exceeding 0.3 cfm/sq ft) of door opening at 0.3 inches of water pressure differential for single doors, and 0.5 cfm/sq ft of door area at 0.3 inches of water pressure differential for double doors for gasketing other than smoke control, as tested according to ASTM E283/E283M; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
2. Rigid, Housed, Perimeter Gasketing: Sponge silicone gasket material held in place by aluminum housing; fastened to frame stop with screws.

### C. Grades: Comply with BHMA A156.22.

### D. Products:

1. Weatherstripping: See Door Hardware Schedule.
2. Meeting Stile Seals: See Door Hardware Schedule.
3. Door Bottom Seals:
  - a. Door Sweeps: See Door Hardware Schedule.

## 2.11 ELECTRIFIED HARDWARE

### A. Manufacturers:

1. dormakaba; dormakaba Group: [www.dormakaba.com/us-en/#sle](http://www.dormakaba.com/us-en/#sle).

### B. Properties:

1. Door Position Switches: Recessed devices with balanced magnetic contacts.
  - a. Power Requirement: 50mA Max, 100 VDC.
  - b. Switch Type: Using two Form C high reliability Rhodium-plated reed switches.
  - c. Provide door position switch that is self-locking in steel and wood.
  - d. SPDT configuration with magnetic tamper.
2. Wire Harnesses: Of sufficient length, with quick connectors.
  - a. Wire Harness End Connection to Power Supply or Junction Box: One end with bare leads.

### C. Products:

## 2.12 KEYS AND CORES

### A. Manufacturers:

1. BEST, dormakaba Group: [www.bestaccess.com/#sle](http://www.bestaccess.com/#sle).

### B. Properties: Complying with guidelines of BHMA A156.28.

1. Provide small format interchangeable core.
2. Provide Best standard keys and cores.
3. Provide keying information in compliance with DHI (KSN) standards.
4. Keying Schedule: Arrange for a keying meeting, with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements.
5. Keying: Master keyed.
6. Include construction keying and control keying with removable core cylinders.
7. Supply keys in following quantities:
  - a. Master Keys: 4 each.
  - b. Construction Master Keys: 6 each.
  - c. Construction Keys: 15 each.
  - d. Construction Control Keys: 2 each.
  - e. Control Keys if New System: 2 each.
8. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
9. Deliver keys with identifying tags to Owner by security shipment direct from manufacturer.
10. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."

11. Include installation of permanent cores and return construction cores to hardware supplier. Construction cores and keys to remain property of hardware supplier.

C. Products:

1. Standard

## 2.13 FINISHES

A. Finishes: Identified in Hardware Sets.

B. Finishes: Provide door hardware of same finish, unless otherwise indicated.

1. Finish: 622; black (former US equivalent US19), 630; satin stainless steel, with stainless steel 3000 series base material (former US equivalent 32D), 652; satin chromium plated over nickel, with steel base material (former US equivalent 26D), 689; aluminum painted, with any base material (former US equivalent US28), and 693; black painted; BHMA A156.18.

C. Exceptions:

1. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
2. Hinges for Fire-Rated Doors: Steel base material with painted finish, in compliance with NFPA 80.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Correct all defects prior to proceeding with installation.
- C. Verify that electric power is available to power operated devices and of correct characteristics.

### 3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install hardware using the manufacturer's fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.
- C. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- D. Install hardware for smoke and draft control doors in accordance with NFPA 105.

- E. Use templates provided by hardware item manufacturer.
- F. Do not install surface mounted items until application of finishes to substrate are fully completed.
- G. Wash down masonry walls and complete painting or staining of doors and frames.
- H. Complete finish flooring prior to installation of thresholds.
- I. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
  - 1. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
  - 2. For Steel Doors and Frames: See Section 6549.
  - 3. For Steel Door Frames: See Section 081213.
  - 4. For Aluminum-Framed Storefront Doors and Frames: See Section 084313.
  - 5. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
  - 6. Flush Wood Doors: See Section 081416.
  - 7. Stile and Rail Wood Doors: See Section 081433.
  - 8. Mounting heights in compliance with ADA Standards:
    - a. Locksets: 40-5/16 inch (1024 mm).
    - b. Push Plates/Pull Bars: 42 inch (1067 mm).
    - c. Deadlocks (Deadbolts): 48 inch (1219 mm).
    - d. Exit Devices: 40-5/16 inch (1024 mm).
    - e. Door Viewer: 43 inch (1092 mm); standard height 60 inch (1524 mm).
- J. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.
  - 1. See Section 079200 for additional requirements.
- K. Include in installation for existing doors and frames any necessary field modification and field preparation of doors and frames for new hardware. Provide necessary fillers, reinforcements, and fasteners for mounting new hardware and to cover existing door and frame preparations.

### 3.3 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of Section 014000 - Quality Requirements.
- B. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

### 3.4 ADJUSTING

- A. Adjust work under provisions of Section 017000 - Execution and Closeout Requirements.



- B. Adjust hardware for smooth operation.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

### 3.5 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation activities.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.
- D. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

### 3.6 PROTECTION

- A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

## HARDWARE SCHEDULES:

### Manufacturer List

Code	Name
BE	Best Access Systems
BY	By Related Section
NA	National Guard
PR	BEST Precision Exit Devices
RC	RCI
ST	BEST Hinges and Sliding
TR	Trimco

### Option List

Code	Description
1/4-20-2" COMBO	1/4-20 X COMBO MS/ANCHOR (SS)
1-3/4"	1-3/4" Thick Doors
36"	36" Door Width
BSHD90	Blade Stop Spacer

## PSU Harrisburg Window Replacement

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C	QUICK CONNECT WIRING OPTION
CA-03	Cylinder Attachment Kit (Rim/SVR Device)
CD	CYLINDER DOGGING
CE-12R	Removable Access Panel
DP90	Drop Plate
LDH	Less Door Height
LDW	Less Door Width
MCS	Mullion Cap Spacer (other Finishes)
MLR	MOTORIZED LATCH RETRACTION
NDW	Net Door Width
RP	RINGS-RIM CYLINDER
TS	TOUCHBAR MONITORING SWITCH
WTS	Weatherized Touchbar Monitoring Switch

## Finish List

Code	Description
605	Bright Brass, Clear Coated
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
AL	Aluminum
WHITE	White

## Hardware Sets

### Set #1 - Single

Doors: A102

1	Continuous Hinge	673HD UL 83" EPT Prep SO	BK	ST
1	Power Transfer	EPT-12C	630	PR
1	Anti-Vandal Pull	1096PHI	630	TR
1	Exit Device	TS 2103 1-3/4" 36" CA-03 CD	630	PR
1	Rim Cylinder	12E-72 STANDARD KEYING RP	626	BE
1	Mortise Cylinder	1E-74 STANDARD KEYING RP5	626	BE
1	Closer	EHD9016 SDST90 BSHD90 DP90	689	BE
1	Perimeter Seal	By Frame Supplier		BY
1	Brush Sweep W / Drip	C627 A FATT x NDW		NA
1	Saddle Threshold	425 HD x DOW x S.S. 1/4-20-2" Combo	AL	NA
1	Termination Harness	WH-6E		ST
1	Thru Wall Harness	WH-192P		ST
1	EPT to Device Harness	WH-6		ST
1	Position Switch	9540	WHITE	RC
1	Wiring Diagram	Point to Point & Riser Drawings		

NOTE: Door normally closed and secured. Door Position switch signals door status. TS switch signals authorized egress. Entry by key. Free egress at all times.

### Set #2 - Single - Electrified Rim Exit

Doors: A101, A107

1	Continuous Hinge	673HD UL 83" EPT Prep SO	BK	ST
1	Power Transfer	EPT-12C	630	PR
1	Anti-Vandal Pull	1096PHI	630	TR
1	Exit Device	C MLR TS 2103 1-3/4" 36" CA-03	605	PR
1	Rim Cylinder	12E-72 STANDARD KEYING RP	626	BE
1	Closer	EHD9016 SDST90 BSHD90 DP90	689	BE
1	Perimeter Seal	By Frame Supplier		BY
1	Brush Sweep W / Drip	C627 A FATT x NDW		NA
1	Saddle Threshold	425 HD x DOW x S.S. 1/4-20-2" Combo	AL	NA
1	Credential Reader	By Access Control Contractor (Div. 28)		BY
1	Power Supply	RPSMLR2		PR

1	Termination Harness	WH-6E		ST
1	Thru Wall Harness	WH-192P		ST
1	EPT to Device Harness	WH-6		ST
1	Position Switch	9540	WHITE	RC
1	Wiring Diagram	Point to Point & Riser Drawings		

NOTE: Door normally closed and secured. Door Position switch signals door status. TS switch signals authorized egress. Entry by key, remote release or approved credential. Free egress at all times.

#### Set #3 - Pair

Doors: A103, A104, A105

2	Continuous Hinge	673HD UL 83" EPT Prep SO	BK	ST
2	Power Transfer	EPT-12C	630	PR
1	Removable Mullion	KR822 MCS	689	PR
1	Anti-Vandal Pull	1096PHI	630	TR
1	Exit Device	TS 2103 1-3/4" 36" CA-03 CD	630	PR
1	Exit Device	TS 2101 1-3/4" 36" CD	630	PR
2	Rim Cylinder	12E-72 STANDARD KEYING RP	626	BE
2	Mortise Cylinder	1E-74 STANDARD KEYING RP5	626	BE
2	Closer	EHD9016 SDST90 BSHD90 DP90	689	BE
1	Perimeter Seal	By Frame Supplier		BY
1	Meeting Stile Seal	By Alum. Door Mfg.		BY
2	Brush Sweep W / Drip	C627 A FATT x NDW		NA
1	Saddle Threshold	425 HD x DOW x S.S. 1/4-20-2" Combo	AL	NA
2	Termination Harness	WH-6E		ST
2	Thru Wall Harness	WH-192P		ST
2	EPT to Device Harness	WH-6		ST
2	Position Switch	9540	WHITE	RC
1	Wiring Diagram	Point to Point & Riser Drawings		

NOTE: Door normally closed and secured. Door Position switch signals door status. TS switch signals authorized egress. Entry by key. Free egress at all times.

#### Set #4 - Pair - Electrified Rim Exit

Doors: A106

2	Continuous Hinge	673HD UL 83" EPT Prep SO	BK	ST
2	Power Transfer	EPT-12C	630	PR
1	Removable Mullion	KR822 MCS	689	PR
1	Anti-Vandal Pull	1096PHI	630	TR
1	Exit Device	C MLR TS 2103 1-3/4" 36" CA-03	605	PR
1	Exit Device	TS 2101 1-3/4" 36" CD	630	PR
2	Rim Cylinder	12E-72 STANDARD KEYING RP	626	BE
1	Mortise Cylinder	1E-74 STANDARD KEYING RP5	626	BE
2	Closer	EHD9016 SDST90 BSHD90 DP90	689	BE
1	Perimeter Seal	By Frame Supplier		BY
1	Meeting Stile Seal	By Alum. Door Mfg.		BY
2	Brush Sweep W / Drip	C627 A FATT x NDW		NA
1	Saddle Threshold	425 HD x DOW x S.S. 1/4-20-2" Combo	AL	NA
1	Credential Reader	By Access Control Contractor (Div. 28)		BY
1	Power Supply	RPSMLR2		PR

2	Termination Harness	WH-6E		ST
2	Thru Wall Harness	WH-192P		ST
2	EPT to Device Harness	WH-6		ST
2	Position Switch	9540	WHITE	RC
1	Wiring Diagram	Point to Point & Riser Drawings		

NOTE: Door normally closed and secured. Door Position switch signals door status. TS switch signals authorized egress. Entry by key, remote release or approved credential. Free egress at all times.

#### Opening List

Opening	Hdw Set	Opening Label	Door Type
A101	2		FG2/A5
A102	1		FG2/A5
A103	3		FG2/A6
A104	3		FG2/W1
A105	3		F/W1
A106	4		F/W1
A107	2		F/W2