SECTION 08 7100 - DOOR HARDWARE

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes:
1. Mechanical and electrified door hardware for:
   a. Swinging doors.
B. Related Sections:
1. Division 01 Section “Alternates” for alternates affecting this section.
2. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.
3. Division 09 sections for touchup finishing or refinishing of existing openings modified by this section.
4. Division 26 sections for connections to electrical power system and for low-voltage wiring.
5. Division 28 sections for coordination with other components of electronic access control system.

1.3 REFERENCES
A. UL - Underwriters Laboratories
   1. UL 10B - Fire Test of Door Assemblies
   2. UL 10C - Positive Pressure Test of Fire Door Assemblies
   3. UL 1784 - Air Leakage Tests of Door Assemblies
   4. UL 305 - Panic Hardware
B. DHI - Door and Hardware Institute
   1. Sequence and Format for the Hardware Schedule
   2. Recommended Locations for Builders Hardware
   3. Key Systems and Nomenclature
C. ANSI - American National Standards Institute
   1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties.
D. Florida Building Codes.

1.4 SUBMITTALS
A. General:
   1. Submit in accordance with Conditions of Contract and Division 01 requirements.
   2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
   3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.
B. Action Submittals:
   1. Product Data: Product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
   2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
      a. Wiring Diagrams: For power, signal, and control wiring and including:
         1) Details of interface of electrified door hardware and building safety and security systems.
         2) Schematic diagram of systems that interface with electrified door hardware.
         3) Point-to-point wiring.
         4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
   a. Door Index; include door number, heading number, and Architects hardware set number.
   b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
   c. Type, style, function, size, and finish of each hardware item.
   d. Name and manufacturer of each item.
   e. Fastenings and other pertinent information.
   f. Location of each hardware set cross-referenced to indications on Drawings.
   g. Explanation of all abbreviations, symbols, and codes contained in schedule.
   h. Mounting locations for hardware.
   i. Door and frame sizes and materials.
   j. Name and phone number for local manufacturer's representative for each product.
   k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
      1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:
   a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system’s function, key symbols used and door numbers controlled.
   b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
      1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
   f. Prepare key schedule by or under supervision of supplier, detailing Owner’s final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:
   1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
   2. Product Certificates for electrified door hardware, signed by manufacturer:
      a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
   3. Certificates of Compliance:
      a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
      b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in “QUALITY ASSURANCE” article, herein.
      c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in “QUALITY ASSURANCE” article, herein.
4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.

5. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:
   1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
      a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
      b. Catalog pages for each product.
      c. Name, address, and phone number of local representatives for each manufacturer.
      d. Parts list for each product.
      e. Final approved hardware schedule edited to reflect conditions as installed.
      f. Final keying schedule
      g. Copies of floor plans with keying nomenclature
      h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
      i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
   1. Where specific manufacturer’s product is named and accompanied by “No Substitute,” including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)
      a. Where no additional products or manufacturers are listed in product category, requirements for “No Substitute” govern product selection.

B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
   1. Warehousing Facilities: In Project’s vicinity.
   2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
   3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer’s standard units in assemblies similar to those indicated for this Project.
   4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
      a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
   2. Can provide installation and technical data to Architect and other related subcontractors.
   3. Can inspect and verify components are in working order upon completion of installation.
   5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
   1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
   2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

F. Exterior Openings Severe Windstorm Components testing: Listed and labeled by a testing and inspecting agency acceptable to authority having jurisdiction, based on testing according to ANSI A250.13. Further compliance with Florida Building Codes for Exterior Openings.
G. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that comply with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

H. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
   1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at tested pressure differential of 0.3-inch wg of water.

I. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

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

K. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.
   1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf.
   2. Maximum opening-force requirements:
      a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
      b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
      c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
   3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
   4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches from latch, measured to leading edge of door.

L. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.
   2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      b. Preliminary key system schematic diagram.
      c. Requirements for key control system.
      d. Requirements for access control.
      e. Address for delivery of keys.

M. Pre-installation Conference: Conduct conference at Project site.
   1. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Inspect and discuss preparatory work performed by other trades.
   3. Inspect and discuss electrical roughing-in for electrified door hardware.
   4. Review sequence of operation for each type of electrified door hardware.
   5. Review required testing, inspecting, and certifying procedures.

N. Coordination Conferences:
   1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
   2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.6 DELIVERY, STORAGE, AND HANDLING

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

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
   1. Deliver each article of hardware in manufacturer’s original packaging.
C. Project Conditions:
   1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
   2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:
   1. Promptly replace products damaged during shipping.
   2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
   3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

F. Deliver keys and permanent cores to Owner by registered mail, overnight package service or hand delivery with signed receipt.

1.7 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

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

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

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

F. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
      a. Closers:
         1) Mechanical: 10 years.
         2) Electrified: 2 years.
      b. Exit Devices:
         1) Mechanical: 3 years.
         2) Electrified: 1 year.
      c. Locksets:
         1) Mechanical: 3 years.
         2) Electrified: 1 year.
      d. Continuous Hinges: Lifetime warranty.
   2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

A. Maintenance Tools:
   1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and particular project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings Awarding Authority has elected to prepare proprietary specifications.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect’s approval.

2.2 MATERIALS

A. Fasteners
   1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
   2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
   3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
   4. Install hardware with fasteners provided by hardware manufacturer.

2.3 HINGES

A. Provide Five-knuckle, Ball Bearing hinges.
   1. Manufacturers and Products:
      a. Scheduled Manufacturer and Product: Best FBB.
   2. Requirements, unless otherwise specified:
      1. 1-3/4” thick doors, up to and including 36 inches wide:
         a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inch high.
         b. Interior: Standard weight, steel, 4-1/2 inch high.
      2. 1-3/4” thick doors over 36 inches wide:
         a. Exterior: Heavy weight, bronze/stainless steel, 5 inch high.
         b. Interior: Heavy weight, steel, 5 inch high.
      3. 2” or thicker doors:
         a. Exterior: Heavy weight, bronze or stainless steel, 5 inch high.
         b. Interior: Heavy weight, steel, 5 inch high.
      4. Provide three hinges per door leaf for doors 90 inches or less in height, and one additional hinge for each 30 inches of additional door height.
      5. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins.
   d. Out-Swinging Interior Lockable Doors: Non-removable pins.
   e. Interior Non-lockable Doors: Non-rising pins.
7. Width of hinges: 4-1/2” at 1-3/4” thick doors, and 5” at 2” or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
8. Doors 36” wide or less furnish hinges 4-1/2” high; doors greater than 36” wide furnish hinges 5” high, heavy weight or standard weight as specified.

2.4 ELECTRIC POWER TRANSFER

A. Manufacturers:
   1. Scheduled Manufacturer and Product: ABH PT200 as specified.

B. Requirements:
   1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gauge of wires sufficient to accommodate electric function of specified hardware.
   2. Locate electric power transfer per manufacturer’s template and UL requirements, unless interference with operation of door or other hardware items.

2.5 BORED LOCKS – GRADE 1, HEAVY DUTY

A. Manufacturers and Products:
   1. Scheduled Manufacturers and Products: Dormakaba Commercial QCL100 Series.

B. Requirements
   1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1. Cylinders: Refer to “KEYING” article, herein.
   2. Provide locks with standard 2-3/4” backset, unless noted otherwise, with 1/2” latch throw.
   3. Provide locksets with separate anti-rotation through bolts, and no exposed screws. Provide levers that operate independently and have external return spring cassettes mounted under roses to prevent lever sag.
   4. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.

2.6 BORED LOCKS – GRADE 2, STANDARD DUTY

A. Manufacturers and Products:
   1. Scheduled Manufacturers and Products: Dormakaba Commercial QCL200 Series.

B. Requirements
   1. Certified by BHMA for ANSI A156.2 Series Grade 2, UL10C listed.
   2. ANSI A117.1 Accessibility Code (ADA Compliant).
   3. Fit modified ANSI A115.2 door preparation.
   4. 2-3/4” backset standard.
   5. Latch Faceplate 1 1/8” x 2 1/4”.
   6. ANSI Strike 1 1/4” x 4 7/8” standard.
   7. 1/2” inch throw latchbolt for all single doors.
   8. Function and design as indicated in the hardware groups.
2.7 CYLINDERS

A. Manufacturer and Product:

B. Requirements: Provide cylinders/cores complying with the following requirements.
   1. Cylinders/cores compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer’s series as indicated.

C. Full-sized cylinders with small format interchangeable cores (SFIC), in the below-listed configuration(s), distributed throughout the Project as indicated.
   1. Keying: Manufacturer-keyed permanent cylinders/cores, configured into keying system per “KEYING” article herein.
   2. Features: Cylinders/cores shall incorporate the following features.

D. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.

E. Identification stamping provisions must be approved by the Architect and Owner.

F. Failure to comply with stamping requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
   1. Forward cylinders/cores to Owner, separately from keys, by means as directed by Owner.

G. Project Cylinder/Core Distribution: Provide cylinders/cores complying with the following requirements in Project locations as indicated.

H. Replaceable Construction Cores.
   1. Provide temporary construction cores replaceable by permanent cores. Provide 12 operating keys for contractor use during construction.

I. Permanent Keyed Cores:
   1. Contractor to replace construction cores with permanent cores as directed by Owner. Installation will be in presence of owner representative, indicating keys operate locking hardware and to turn over all permanent keys.

2.8 KEYING

A. Keying System: Factory registered, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Keying Requirements – General for Commercial
   1. Permanent cylinders/cores keyed by the manufacturer according to the following key system.

C. Key Features: Provide keys with the following features.
   1. Patent Protection: Keys and blanks protected by a special broching in restricted keyway

D. Keys
   1. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   2. Identification: Stamp all keys with keyset symbol
   3. Quantity of keys:
      a. Provide (2) operating keys per keyed core.
      b. Provide (6) Master Keys.
      c. Provide (2) Control Keys

E. Coordinate with cylinder/core and key identification requirements above.

F. Stamp keys with Owner’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE”.

G. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
2.9 DOOR CLOSERS - MEDIUM DUTY

A. Manufacturers and Products:

B. Requirements:
   1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
   2. Provide door closers with fully hydraulic, full rack and pinion action.
   3. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
   4. Spring Power: Continuously adjustable over full range of closer sizes and providing reduced opening force as required by accessibility codes and standards.
   5. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
   6. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.10 PROTECTION PLATES

A. Manufacturers:
   1. Scheduled Manufacturer: Trimco
   2. Acceptable Manufacturers: Burns, Don-Jo, Ives, Rockwood

B. Requirements:
   1. Provide kick plates, mop plates, and armor plates minimum of 1/8 inch thick as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
   2. Sizes of plates:
      a. Kick Plates: 8 inches high by 2 inches less width of door on single doors, 1 inch less width of door on pairs

2.11 DOOR STOPS AND HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturer: Trimco
   2. Acceptable Manufacturers: Burns, Don-Jo, Ives, Rockwood

B. Provide door stops at each door leaf:
   1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
   2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
   3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.12 GASKETING

A. Manufacturers:
   1. Scheduled Manufacturer: National Guard
   2. Acceptable Manufacturers: Pemko, Reese, Zero International

B. Requirements:
   1. Provide gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.

2.13 SILENCERS

A. Manufacturers:
   1. Scheduled Manufacturer: Trimco
   2. Acceptable Manufacturers: Burns, Don-Jo, Ives, Rockwood

B. Requirements:
   1. Provide "push-in" type silencers for hollow metal or wood frames.
   2. Provide one silencer per 30 inches of height on each single frame, and two for each pair frame.
   3. Omit where gasketing is specified.
2.14 KEY CONTROL CABINET
   A. Manufacturers:
      1. Telkee, Lund, MMF.
   B. Key Control Cabinet: Provide one wall mounted key cabinet complete with hooks, index and tags to accommodate 50% expansion. Coordinate mounting location with architect.

2.15 FINISH
   A. Designations used in Schedule of Finish Hardware - 3.7, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products.
   B. Powder coat door closers to match other hardware, unless otherwise noted.
   C. Aluminum items shall be finished to match predominant adjacent material. Gasketing to coordinate with frame color.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
   B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
   C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
   D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
   A. Where on-site modification of doors and frames is required:
      1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
      2. Field modify and prepare existing door and frame for new hardware being installed.
      3. When modifications are exposed to view, use concealed fasteners, when possible.
      4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
         a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
         b. Wood Doors: DHI WDHS.5 “Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors.”
         c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION
   A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
      2. Custom Steel Doors and Frames: HMMA 831.
   B. Install each hardware item in compliance with manufacturer’s instructions and recommendations, using only fasteners provided by manufacturer.
   C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

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

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

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

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
   1. Replace construction cores with permanent cores as indicated in keying section.

I. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

J. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section “Joint Sealants.”

K. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

L. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

M. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

N. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
   2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
   3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

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

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

3.6 DEMONSTRATION

A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section “Demonstration and Training.”

3.7 DOOR HARDWARE SCHEDULE

A. Locksets, options, cylinders/keying, and other requirements. exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above specifications for special features.
# Manufacturer List

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>ABH Manufacturing Inc.</td>
</tr>
<tr>
<td>BE</td>
<td>Best Access Systems</td>
</tr>
<tr>
<td>BY</td>
<td>By Related Section</td>
</tr>
<tr>
<td>NA</td>
<td>National Guard</td>
</tr>
<tr>
<td>RC</td>
<td>RCI</td>
</tr>
<tr>
<td>SH</td>
<td>dormakaba Commercial Hardware</td>
</tr>
<tr>
<td>ST</td>
<td>BEST Hinges and Sliding</td>
</tr>
<tr>
<td>TR</td>
<td>Trimco</td>
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# Finish List

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>26D</td>
<td>Satin Chrome</td>
</tr>
<tr>
<td>626</td>
<td>Satin Chromium Plated</td>
</tr>
<tr>
<td>630</td>
<td>Satin Stainless Steel</td>
</tr>
<tr>
<td>689</td>
<td>Aluminum Painted</td>
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<tr>
<td>US28</td>
<td>Aluminum - Clear Anodized</td>
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# Option List

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>478S</td>
<td>4 7/8&quot; ANSI Strike</td>
</tr>
<tr>
<td>BF - 7 Pin Combinated</td>
<td>BF - 7 Pin Combinated</td>
</tr>
<tr>
<td>CSK</td>
<td>Counter Sinking of Kick Plates</td>
</tr>
<tr>
<td>F</td>
<td>Full Size Cover</td>
</tr>
<tr>
<td>SN</td>
<td>Sex Nuts</td>
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</table>
# Hardware Sets

## Set #01 - Int - Sgl - Multi-Restroom
Doors: 122, 123

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Set No.</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Butt Hinge</td>
<td>FBB179 4.5&quot; x 4.5&quot;</td>
<td>26D</td>
<td>ST</td>
</tr>
<tr>
<td>1 Passage Set</td>
<td>QCL230 M 478S</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>QDC211 F SN</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>1 Wall Bumper</td>
<td>1270WV</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>3 Silencer</td>
<td>1229A</td>
<td></td>
<td>GREY</td>
</tr>
</tbody>
</table>

## Set #02 - Int - Sgl - Office

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Set No.</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Butt Hinge</td>
<td>FBB179 4.5&quot; x 4.5&quot;</td>
<td>26D</td>
<td>ST</td>
</tr>
<tr>
<td>1 Office / Entry Lockset</td>
<td>QCL251 M 478S BF - 7 Pin Combinated</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>1 Wall Bumper</td>
<td>1270WV</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>3 Silencer</td>
<td>1229A</td>
<td></td>
<td>GREY</td>
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</tbody>
</table>

## Set #03 - Int - Sgl - Mech / Elec
Doors: 119

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Set No.</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Butt Hinge</td>
<td>FBB179 4.5&quot; x 4.5&quot;</td>
<td>26D</td>
<td>ST</td>
</tr>
<tr>
<td>1 Storeroom Lockset</td>
<td>QCL271 M 478S BF - 7 Pin Combinated</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>QDC213 F SN</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>1 Gasketing</td>
<td>5050 C (Head &amp; Jamb)</td>
<td></td>
<td>NA</td>
</tr>
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</table>

## Set #04 - Int - Sgl - Break Room
Doors: 120

<table>
<thead>
<tr>
<th>Item</th>
<th>Model/Description</th>
<th>Set No.</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Butt Hinge</td>
<td>FBB179 4.5&quot; x 4.5&quot;</td>
<td>26D</td>
<td>ST</td>
</tr>
<tr>
<td>1 Passage Set</td>
<td>QCL230 M 478S</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>QDC211 F SN</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>1 Wall Bumper</td>
<td>1270WV</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>1 Gasketing</td>
<td>5050 C (Head &amp; Jamb)</td>
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<td>NA</td>
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</tbody>
</table>

## Set #05 - Int - Sgl - Storage
Doors: 103, 112, 124, 125

<table>
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<tr>
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<th>Model/Description</th>
<th>Set No.</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Butt Hinge</td>
<td>FBB179 4.5&quot; x 4.5&quot;</td>
<td>26D</td>
<td>ST</td>
</tr>
<tr>
<td>1 Storeroom Lockset</td>
<td>QCL271 M 478S BF - 7 Pin Combinated</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>QDC211 F SN</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>1 Wall Bumper</td>
<td>1270WV</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>3 Silencer</td>
<td>1229A</td>
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<td>GREY</td>
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</tbody>
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**NOTE**: Delete Wall Bumper and provide QDC213 F SN Closer on Door 103.
### Set #06 - Int - Sgl - Secure Vestibule - CR

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Model</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors</td>
<td>121</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Butt Hinge</td>
<td>FBB168 4.5&quot; x 4.5&quot; NRP</td>
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<td>26D ST</td>
</tr>
<tr>
<td>Electrified Lockset</td>
<td>QCL193 M 478S BF - 7 Pin Combinated</td>
<td>1</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>Door Closer</td>
<td>QDC213 F SN</td>
<td>1</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>1</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>Card Reader</td>
<td>By Owner's Security Vendor</td>
<td>1</td>
<td></td>
<td>BY</td>
</tr>
<tr>
<td>Power Transfer</td>
<td>PT200</td>
<td>1</td>
<td>US28</td>
<td>AB</td>
</tr>
<tr>
<td>Power Supply</td>
<td>DKPS-2A</td>
<td>1</td>
<td></td>
<td>RC</td>
</tr>
<tr>
<td>Gasketing</td>
<td>5050 C (Head &amp; Jamb)</td>
<td>1</td>
<td></td>
<td>NA</td>
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</tbody>
</table>

**NOTE:** Card Reader and Wiring by Owner's Security Vendor.

Door normally closed and locked.
Card Reader releases trim on Electronic Lockset allowing entry.
Mechanical key in outside cylinder retracts latchbolt for entry.
Lockset to be released by activation of Building Fire Alarm System.
Door re-locks after closure.
Free Egress at all times by inside lever.
Coordinate electrical requirements with the electrical and security contractor.

### Set #07 - Int - Sgl - Secure Vestibule

<table>
<thead>
<tr>
<th>Item</th>
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<th>Model</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors</td>
<td>101A</td>
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<td></td>
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</tr>
<tr>
<td>Butt Hinge</td>
<td>FBB168 4.5&quot; x 4.5&quot;</td>
<td>3</td>
<td></td>
<td>26D ST</td>
</tr>
<tr>
<td>Passage Set</td>
<td>QCL230 M 478S</td>
<td>1</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>Door Closer</td>
<td>QDC213 F SN</td>
<td>1</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>1</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>Gasketing</td>
<td>5050 C (Head &amp; Jamb)</td>
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### Set #08 - Int - Sliding Reception Window

<table>
<thead>
<tr>
<th>Item</th>
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<th>Model</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Doors</td>
<td>102B</td>
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</tr>
<tr>
<td>Cylinder STD Hardware</td>
<td>As Required</td>
<td>1</td>
<td>626</td>
<td>BE</td>
</tr>
<tr>
<td>Remainder of Hrdwr. by Door Supplier</td>
<td></td>
<td></td>
<td></td>
<td>BY</td>
</tr>
</tbody>
</table>

### Set #09 - Int - Sgl - Reception

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Model</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doors</td>
<td>102A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butt Hinge</td>
<td>FBB179 4.5&quot; x 4.5&quot;</td>
<td>3</td>
<td></td>
<td>26D ST</td>
</tr>
<tr>
<td>Passage Set</td>
<td>QCL230 M 478S</td>
<td>1</td>
<td>626</td>
<td>SH</td>
</tr>
<tr>
<td>Door Closer</td>
<td>QDC211 F SN</td>
<td>1</td>
<td>689</td>
<td>SH</td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>1</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>Wall Bumper</td>
<td>1270WV</td>
<td>1</td>
<td>630</td>
<td>TR</td>
</tr>
<tr>
<td>Silencer</td>
<td>1229A</td>
<td>3</td>
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<td>GREY TR</td>
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</table>

---

**June 24, 2023**
### Set #10 - Int - Sgl - Waiting - CR

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Model/Description</th>
<th>Door Type</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butt Hinge</td>
<td>FBB168 4.5&quot; x 4.5&quot; NRP</td>
<td>26D ST</td>
<td></td>
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<tr>
<td>Electrified Lockset</td>
<td>QCL195 M 478S BF - 7 Pin Combinated</td>
<td>626 SH</td>
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</tr>
<tr>
<td>Door Closer</td>
<td>QDC211 F SN</td>
<td>689 SH</td>
<td></td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630 TR</td>
<td></td>
</tr>
<tr>
<td>Wall Bumper</td>
<td>1270WV</td>
<td>630 TR</td>
<td></td>
</tr>
<tr>
<td>Card Reader</td>
<td>By Owner's Security Vendor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Transfer</td>
<td>PT200</td>
<td>US28 AB</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>DKPS-2A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630 TR</td>
<td></td>
</tr>
<tr>
<td>Wall Bumper</td>
<td>1270WV</td>
<td>630 TR</td>
<td></td>
</tr>
<tr>
<td>Card Reader</td>
<td>By Owner's Security Vendor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Transfer</td>
<td>PT200</td>
<td>US28 AB</td>
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<tr>
<td>Power Supply</td>
<td>DKPS-2A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630 TR</td>
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</tr>
<tr>
<td>Wall Bumper</td>
<td>1270WV</td>
<td>630 TR</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**: Card Reader and Wiring by Owner's Security Vendor.

Door normally closed and locked.
Card Reader releases trim on Electronic Lockset allowing entry.
Mechanical key in outside cylinder retracts latchbolt for entry.
Door re-locks after closure.
Free Egress at all times by inside lever.
Coordinate electrical requirements with the electrical and security contractor.

### Set #11 - Int - Sgl - Entry

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Model/Description</th>
<th>Door Type</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butt Hinge</td>
<td>FBB168 4.5&quot; x 4.5&quot; NRP</td>
<td>26D ST</td>
<td></td>
</tr>
<tr>
<td>Office / Entry Lockset</td>
<td>QCL251 M 478S BF - 7 Pin Combinated</td>
<td>626 SH</td>
<td></td>
</tr>
<tr>
<td>Door Closer</td>
<td>QDC211 F SN</td>
<td>689 SH</td>
<td></td>
</tr>
<tr>
<td>Kick Plate</td>
<td>K0050 8&quot; x 2&quot; LDW CSK</td>
<td>630 TR</td>
<td></td>
</tr>
<tr>
<td>Wall Bumper</td>
<td>1270WV</td>
<td>630 TR</td>
<td></td>
</tr>
<tr>
<td>Gasketing</td>
<td>5050 C (Head &amp; Jamb)</td>
<td>NA</td>
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</tr>
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</table>

### Set #12 - Exist - Ext - Exit - Alum

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Model/Description</th>
<th>Door Type</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder STD</td>
<td>As Required</td>
<td>626 BE</td>
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<tr>
<td>Hardware</td>
<td>Remainder of Hrdwr. by Door Supplier</td>
<td>BY</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**: Provide Card Reader, Power Supply and Transfer on Door x002.
Aluminum Doors. All hardware provided by door supplier except cylinder as noted above.
Tested assembly to comply with project wind load requirements.
Weatherstrip by Aluminum Door Supplier.
Verify Owner's requirements for Access Control.

### Set #13 - Exist Sliding Door - Alum

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Model/Description</th>
<th>Door Type</th>
<th>Note</th>
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</thead>
<tbody>
<tr>
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<td>ALL HARDWARE BY DOOR MFR.</td>
<td>BY</td>
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## Opening List

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<th>Hdw Set</th>
<th>Opening Label</th>
<th>Door Type</th>
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<tbody>
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<td>HM</td>
</tr>
<tr>
<td>105</td>
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