PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Commercial door hardware for the following:
      a. Swinging doors.
      b. Other doors to the extent indicated.
   2. Cylinders for doors specified in other Sections.
   3. Electrified door hardware.

B. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
   1. Final replacement cores and keys to be installed by the University.

1.2 SUBMITTALS

A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Details of electrified door hardware, indicating the following:
   1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring. Include the following:
      a. System schematic.
      b. Point-to-point wiring diagram.
      c. Riser diagram.
      d. Elevation of each door.
   2. Detail interface between electrified door hardware and access control system.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Design/Builder, Architect, and the University about door hardware and keying.
   1. Electrified Door Hardware Supplier Qualifications: An experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials.
      a. Engineering Responsibility: Prepare 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.

C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and 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.

1. Electrified Door Hardware Qualifications: Experienced in providing consulting services for electrified door hardware installations.

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

E. Regulatory Requirements: Comply with provisions of the following:
   1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," Title 24 of the California Code of Regulations, and ICC/ANSI A117.1 as follows:
      a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
      b. Door Closers: Comply with the following maximum opening-force requirements indicated:
         1) Interior and Exterior Hinged Doors: 5 lbf applied perpendicular to door.
         2) Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
         3) Fire Doors: 15 lbf maximum applied perpendicular to door.
      c. Thresholds: Top of threshold not more than 1/2 inch above the floor or landing, not more than 1/4 inch maximum vertical edge, and change in level between 1/4 inch and 1/2 inch beveled at a gradient of not more than 1:2
   2. In addition to complying with other requirements specified, comply with the following for means of egress doors:
      a. Latches, Locks, and Exit Devices: Not more than 15 lbf to actuate exit devices and latches when applied in the direction of exit travel. Locks shall not require the use of a key or special knowledge or effort for operation.
      b. Delayed Egress Locks: Lock releases within 15 seconds after applying a force, not more than 15 lb. and not more than 2 seconds.
   3. Electrified Door Hardware: Listed and labeled as defined in California Electrical Code, Article 100, by a testing agency acceptable to authorities having jurisdiction.

F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UBC Standard 7-2 (based on UL 10 B-1988) and UL 10 C.
   1. Test Pressure (Positive-pressure test): After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches or less above the sill.

G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Review methods and procedures related to door hardware including, but not limited to, the following:
   1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
   2. Review sequence of operation for each type of electrified door hardware.

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

1.4 COORDINATION

A. Coordinate layout and installation of recessed pivots and closers with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

B. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices and access control system.

1.5 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive the University of other rights the University may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Design/Builder under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of operators and door hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period: 2 years from date of Completion, unless otherwise indicated.

D. Warranty Period for Locksets and Exit Devices: 5 years from date of Completion.

E. Warranty Period for Surface Manual Closers: 10 years from date of Completion. Closer shells shall be warranted for the lifetime of building in which installed.

F. Warranty Period for Concealed Floor and Overhead Closers: 10 years from date of Completion.

G. Warranty Period for Continuous Hinges: 10 years from date of Completion.

1.6 MAINTENANCE SERVICE

A. Maintenance Service: Beginning at Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Delete this Article if door hardware allowance is used or if there is no Door Hardware Schedule.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
   2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES AND PIVOTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hinges:
      a. Hager Companies (HAG).
      b. McKinney Products Company; Div. of Assa Abloy. (MCK).
   2. Pivots and Pivot Hinges:
      a. Rixson-Firemark, Inc.; Div. of Yale Security Inc. (RIX).
      b. McKinney Products Company; Div. of Assa Abloy. (MCK).
   3. Continuous Pin and Barrel Hinges:
      a. Markar Products, Inc. (MAR).
      b. McKinney Products Company; Div. of Assa Abloy. (MCK).

B. Electrified Functions for Hinges: Comply with the following:
   1. Electrical Contact: Exposed electrical contacts for transfer of power.
   2. Power Transfer: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle.
   3. Monitoring: Concealed electrical monitoring switch.
   4. Power Transfer and Monitoring: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle, and with concealed electrical monitoring switch.

C. Continuous-Pin and Barrel Hinges: Minimum 0.25 diameter stainless steel pin, with 14 gauge stainless steel or aluminum hinge leaves, carrying doors weighing up to 600 pounds and durability tested minimum of 1,500,000 cycles; fabricated to full height of door and frame. Fabricate hinges to symmetrical template screw locations.

D. Fasteners: Comply with the following:
   1. Threaded Inserts: For metal doors and frames.
   2. Wood Screws: For wood doors and frames.

3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head screws. Finish screw heads to match surface of hinges.

## 2.3 LOCKSETS AND PASSAGE SETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Mechanical Locks and Latches:
      a. Sargent Architectural Hardware; Div. of Essex (SGT).
      b. Yale Commercial Hardware, Div of Assa Abloy (YAL).

B. Standards: Comply with the following:
   1. Mortise Locks and Latches: BHMA A156.13.
   2. Auxiliary Locks: BHMA A156.5.
   3. Exit Locks: BHMA A156.5.

C. Mortise Locks: Stamped steel case with steel or brass parts; BHMA Grade 1; Series 1000.
   1. Lock Body shall include quick reversibility mechanism without removing lock body cover.
   2. Lock shall include stainless steel latch bolt and must remain 50% inside lock body.
   3. Lock body shall meet ANSI Operational Grade 1 & Security Grade 1.
   4. Lever design to return within ½" of door face.
   5. Lever return springs shall be internal to the lock case.
   6. Locksets shall be capable of direct retrofit into existing campus doors prepped for mortise locksets. No altering or drilling of new holes shall be required to fit existing.

D. Auxiliary Locks: BHMA Grade 1.

E. Certified Products: Provide door hardware listed in the following BHMA directories:
   1. Mechanical Locks and Latches: BHMA's "Directory of Certified Locks & Latches."

F. Backset: 2-3/4 inches unless otherwise indicated.

## 2.4 ELECTRIFIED LOCKS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Electric Mortise Locksets:
      a. Sargent Architectural Hardware; Div. of Essex (SGT).
      b. Yale Commercial Hardware, Div of Assa Abloy (YAL).

B. Electric Controlled Mortise Locksets: Solenoid operated, self-contained in mortise lock case, with internal rectifier. ULC Listed fail-secure locks of types and grades indicated; with 24 volt DC continuous duty solenoid lock mounted inside door and strike plate attached to frame. Comply with the following:
   1. BHMA Grade: Grade 1.
   2. Equip locksets with internal “RX” switch to monitor inside/outside lever.
   3. UL listed regulated and filtered 24VDC power supplies furnished with lockset.

C. Exit Locks: Surface-mounted deadbolts or latch bolts; with battery-powered alarm that sounds when unauthorized use of door occurs; housed in metal case. Provide red-and-white pressure-sensitive lettering reading "PUSH TO OPEN--ALARM WILL SOUND."

2.5 DOOR BOLTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Surface Bolts:
      a. Door Controls International (DCI).
      b. Hager Companies (HAG).
      c. Ives: H. B. Ives (IVS).
      d. Triangle Brass Manufacturing Company, Inc. (TRM).
   2. Flush Bolts:
      a. Door Controls International (DCI).
      b. Ives: H. B. Ives (IVS).
      c. Triangle Brass Manufacturing Company, Inc. (TRM).

2.6 EXIT DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Panic Exit Devices:
      a. Sargent Architectural Hardware; Div. of Essex (SGT).
      b. Yale Commercial Hardware, Div of Assa Abloy (YAL).

B. Standard: BHMA A156.3.
   1. BHMA Grade: Grade 1.

C. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UBC Standard 10-4 (based on UL 305-79) and UBC Standard 7-2 (based on UL 10B-1998).

D. Panic Exit Device Construction: Modern push pad type with no more than 3-1/4” projection, reversible device with heavy-duty cold forged steel or bronze chassis, satin stainless steel latch cover, rail, touch bar and end cap.
   1. Electric exit devices shall be low–current draw units, with maximum inrush of 2 amps, normal operation not to exceed .45 amps and maximum .172 amps solenoid seated.

2.7 CYLINDERS AND KEYING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cylinders and Keys:
      a. Yale Commercial Hardware; Div. of Assa Abloy. (YAL).
      b. Telkee; Division of Sunroc Corporation (SUN).

B. Standards: Comply with the following:
   1. Cylinders: BHMA A156.5.
   2. Key Control System: BHMA A156.5.

C. Cylinder Grade: BHMA Grade 1.

D. Cylinders: Yale interchangeable core type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:

1. Number of Pins: Seven
2. YALE ZC Keyway ( Campus Standard )
3. Mortise Type: Threaded cylinders with rings and straight cam.
4. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
5. Exterior door cylinders shall have security collars to prevent wrenching of cylinder from lockset or panic exit trim.
6. Verify appropriate cam is installed for cylinder is compatible with specified lock.

E. Construction Keying: Comply with the following:
1. Construction Keys: Provide 20 construction keys and 2 control keys.
2. Construction Cylinders: Provide construction cores to be replaced by permanent cores.
   a. Furnish permanent cores and control keys to the University, via Registered Restricted shipment, - “Return Receipt Requested”.

2.8 STRIKES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Electric Strikes:
   a. Hanchett Entry Systems. (HES).
   b. Securitron (SEC).

2.9 CLOSERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Surface-Mounted Closers:
   a. Norton Door Controls; Div. of Assa Abloy (NOR).
   b. Sargent; Div of Essex (SGT).
2. Concealed Overhead Closers:
   a. Rixson-Firemark, Inc.; Div. of Assa Abloy (RIX).
3. Closer Holder Release Devices:
   a. Norton Door Controls; Div. of Assa Abloy (NOR).
   b. Rixson-Firemark, Inc.; Div. of Assa Abloy (RIX).

B. Standards: Comply with the following:
1. Closers: BHMA A156.4.
2. Closer Holder Release Devices: BHMA A156.15.

C. Surface Closers: BHMA Grade 1, non-handed.

D. Concealed Overhead Closers: BHMA Grade 1, with fully adjustable spring power and delayed action closing.

E. Power-Assist Closers: Provide electro-hydraulic, surface mounted low energy operators with rack and pinion design contained within cast aluminum housing. Door closing force shall be adjustable to insure adequate closing control. Operator shall have an adjustable back check feature to cushion the door opening speed if opened violently. Power operator unit shall provide conventional door closer opening and closing forces unless the power

operator motor is activated by an initiating device. Door control shall be adjustable to provide compliance with the requirements of the Americans with Disabilities Act (ADA) and ANSI Standards A117.1 and A156.19 Furnish unit with push button controls for setting door close and door open positions. Operators to have open obstruction detection and close obstruction detection built into the unit. Operators to have door closer assembly with adjustable spring size, separate adjustable valves for latch, sweep speed, and pressure adjustment to control door closing valve.

1. Low Energy Operators shall be tested to over 1,000,000 cycles in an approved certified BHMA testing facility.
2. Provide operators which have modular design to allow separate repair service and replacement of body motor-pump assembly, control board and ELS board components.

2.10 STOPS AND HOLDERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Don-Jo Manufacturing (DJM).
   2. Ives: H. B. Ives (IVS).
   3. Norton Door Controls; Div. of Yale Security Inc. (NOR).

B. Standards: Comply with the following:
   1. Stops and Bumpers: BHMA A156.16.
   2. Mechanical Door Holders: BHMA A156.16.
   3. Electromagnetic Door Holders: BHMA A156.15.
   4. Combination Overhead Holders and Stops: BHMA A156.8.
   5. Door Silencers: BHMA A156.16.

C. Electromagnetic Door Holders for Labeled Fire Door Assemblies: Coordinate with fire detectors and interface with fire alarm system.

D. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
   1. Where floor or wall stops are not appropriate, provide overhead holders.

E. Silencers for Wood Door Frames: BHMA Grade 1; neoprene or rubber, minimum 5/8 by 3/4 inch; fabricated for drilled-in application to frame.

F. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch; fabricated for drilled-in application to frame.

2.11 DOOR GASKETING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Door Gasketing:
      a. National Guard Products, Inc. (NGP).
      b. Pemko Manufacturing Co., Inc. (PEM).
      c. Reese Enterprises, Inc. (RE).
   2. Door Bottoms:
      a. National Guard Products, Inc. (NGP).
      b. Pemko Manufacturing Co., Inc. (PEM).
      c. Reese Enterprises, Inc. (RE).
      d. Standard: Comply with BHMA A156.22.

B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
   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 closed.
   3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

C. Air Leakage: Not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.

D. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UBC Standard 7-2 (based on UL 10B-1988) and UL 10 C.
   1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.

E. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL 10B or NFPA 252.

F. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.

G. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

H. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.

I. Shall be drilled and machined for fasteners at factory.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 series.
   1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.

B. Wood Doors: Comply with DHI A115-W series.

### 3.2 INSTALLATION

A. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room. Verify location with Design/Builder.
   1. Configuration: Provide one power supply for each door opening.
   2. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.

3.3 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Design/Builder will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
   1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

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 so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

B. Six-Month Adjustment: Approximately six months after date of Notice of Completion, Installer shall perform the following:
   1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
   2. Consult with and instruct the University's personnel on recommended maintenance procedures.
   3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

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

END OF SECTION