1. **GENERAL**
	1. RELATED DOCUMENTS
		1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
	2. SUMMARY
		1. This Section includes commercial door hardware for the following:
			1. Swinging doors.
			2. Sliding doors.
			3. Other doors to the extent indicated.
		2. Door hardware includes, but is not necessarily limited to, the following:
			1. Mechanical door hardware.
			2. Electromechanical door hardware.
			3. Automatic operators.
			4. Cylinders specified for doors in other sections.
		3. Related Sections:
			1. Division 08 Section “Hollow Metal Doors and Frames”.
			2. Division 08 Section “Flush Wood Doors”.
			3. Division 08 Section “Sound Control Hollow Metal Door Assemblies”.
			4. Division 08 Section “Sound Control Wood Door Assemblies”.
			5. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
			6. Division 08 Section “Automatic Door Operators”.
		4. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
			1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
			2. ICC/IBC - International Building Code.
			3. NFPA 70 - National Electrical Code.
			4. NFPA 80 - Fire Doors and Windows.
			5. NFPA 101 - Life Safety Code.
			6. NFPA 105 - Installation of Smoke Door Assemblies.
			7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
			8. State Building Codes, Local Amendments.
	3. SUBMITTALS
		1. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions, and finishes.
		2. Door Hardware Schedule: Prepared by or under the supervision of the supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
			1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
			2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in the same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
			3. Content: Include the following information:
				1. Type, style, function, size, label, hand, and finish of each door hardware item.
				2. Manufacturer of each item.
				3. Fastenings and other pertinent information.
				4. Location of door hardware set, cross-referenced to Drawings, both on floor plans and indoor and frame schedule.
				5. Explanation of abbreviations, symbols, and codes contained in the schedule.
				6. Mounting locations for door hardware.
				7. Door and frame sizes and materials.
				8. Warranty information for each product.
			4. Submittal Sequence: Submit the final Door Hardware Schedule at the earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
		3. Informational Submittals:
			1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by the manufacturer and witnessed by a qualified independent testing agency.
		4. Operating and Maintenance Manuals: Provide manufacturers with operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.
	4. QUALITY ASSURANCE
		1. Manufacturers Qualifications: Engage qualified manufacturers with a minimum of 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
		2. Installer Qualifications: A minimum 3 years of documented experience installing both standard and electrified 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.
		3. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years of documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
		4. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
			1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third-party source will not be accepted.
			2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
		5. Each unit is to bear a third-party permanent label demonstrating compliance with the referenced standards.
		6. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
			1. Before installation of door hardware, conduct a project-specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal, and wood doors. Training will include the use of installation manuals, hardware schedules, templates, and physical product samples as required.
			2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
			3. Review the sequence of operation narratives for each unique access-controlled opening.
			4. Review and finalize the construction schedule and verify the availability of materials.
			5. Review the required inspecting, testing, commissioning, and demonstration procedures
		7. After installation, provide written documentation that components were applied to the manufacturer's instructions and recommendations and according to the approved schedule.
	5. DELIVERY, STORAGE, AND HANDLING
		1. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to the Project site. Do not store electronic access control hardware, software, or accessories at the Project site without prior authorization.
		2. Tag each item or package separately with identification related to the final Door Hardware Schedule and include basic installation instructions with each item or package.
	6. COORDINATION
		1. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory-prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
		2. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced, and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling, and access control system hardware without additional in-field modifications.
	7. WARRANTY
		1. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrently with, other warranties made by the Contractor under requirements of the Contract Documents.
		2. Warranty Period: Written warranty, executed by the manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within the specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
			1. Structural failures including excessive deflection, cracking, or breakage.
			2. Faulty operation of the hardware.
			3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
			4. Electrical component defects and failures within the system's operation.
		3. Standard Warranty Period: One year from the date of Substantial Completion, unless otherwise indicated.
		4. Special Warranty Periods:
			1. Ten years for mortise locks and latches.
			2. Five years for exit hardware.
			3. Twenty-five years for manual overhead door closer bodies.
			4. Five years for motorized electric latch retraction exit devices.
			5. Two years for electromechanical door hardware.
	8. MAINTENANCE SERVICE
		1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for the Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
2. **PRODUCTS**
	1. SCHEDULED DOOR HARDWARE
		1. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that the products are to be supplied under.
		2. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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 establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
		3. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the owner, and their designated consultants.
	2. SCHEDULED DOOR HARDWARE
		1. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that the products are to be supplied under.
		2. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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 establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
		3. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the owner, and their designated consultants.
	3. HANGING DEVICES
		1. Hinges: ANSI/BHMA A156.1 certified butt hinges with the number of hinge knuckles and other options as specified in the Door Hardware Sets.
			1. Quantity: Provide the following hinge quantity:
				1. Two Hinges: For doors with heights up to 60 inches.
				2. Three Hinges: For doors with heights 61 to 90 inches.
				3. Four Hinges: For doors with heights 91 to 120 inches.
				4. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
			2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
				1. Widths up to 3’0”: 4-1/2” standard or heavyweight as specified.
				2. Sizes from 3’6” to 4’0”: 5” standard or heavyweight as specified.
			3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
				1. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil-impregnated bearing hinges unless Hardware Sets indicate standard weight.
				2. Interior Doors: Standard weight, steel, ball bearing or oil-impregnated bearing hinges unless Hardware Sets indicate heavy weight.
			4. Hinge Options: Comply with the following:
				1. Non-removable Pins: With the exception of electric through wire hinges, provide a set screw in the hinge barrel that, when tightened into a groove in the hinge pin, prevents removal of a pin while the door is closed; for the all-out-swinging lockable doors.
			5. Manufacturers:
				1. Hager Companies (HA).
				2. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
		2. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with a minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible, and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
			1. Manufacturers:
				1. IVES (IV).
				2. Hager Companies (HA).
				3. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
		3. Pivots: ANSI/BHMA A156.4, Grade 1, certified. Space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil-impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL-listed for windstorms where applicable.
			1. Manufacturers:
				1. IVES 7200 Series (IV).
				2. Architectural Builders Hardware (AH).
				3. Rixson Door Controls (RF).
	4. POWER TRANSFER DEVICES
		1. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and a sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
			1. Manufacturers:
				1. IVES (IV) – 5BB1HW – TW8
				2. Hager Companies (HA) - ETW-QC (# wires) Option.
				3. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.
		2. Electrified Quick Connect Intermediate Transfer Pivots: Provide electrified offset intermediate transfer pivot hinges with Molex™ standardized plug connectors and a sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly into through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
			1. Manufacturers:
				1. IVES (IV) – TW8
				2. Architectural Builders Hardware (AH) - EL019-EZ (# wires).
				3. Rixson Door Controls (RF) - E-M19-QC (# wires).
		3. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and a sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies.
			1. Manufacturers:
				1. Securitron (SU) - EL-CEPT Series.
				2. Von Duprin (VD) - EPT-10 Series.
	5. DOOR OPERATING TRIM
		1. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
			1. Flush bolts to be furnished with a top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
			2. Furnish dust-proof strikes for bottom bolts.
			3. Surface bolts to be a minimum of 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
			4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
			5. Manufacturers:
				1. IVES (IV) – FB Series
				2. Burns Manufacturing (BU).
				3. Door Controls International (DC).
				4. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
		2. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever, and inactive-leaf release trigger. Model as indicated in hardware sets.
			1. Manufacturers:
				1. IVES (IV) – CORG.
				2. Burns Manufacturing (BU).
				3. Door Controls International (DC).
				4. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
		3. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
			1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
			2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2 inches from the face of the door unless otherwise indicated.
			3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2 inches from the face of the door and offset of 90 degrees unless otherwise indicated.
			4. Fasteners: Provide the manufacturer's designated fastener type as indicated in Hardware Sets.
			5. Manufacturers:
				1. IVES (IV).
				2. Burns Manufacturing (BU).
				3. Hiawatha, Inc. (HI).
				4. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
	6. CYLINDERS AND KEYING
		1. General: Cylinder manufacturer to have a minimum (10) years of experience designing secured master key systems and have on record a published security keying system policy.
		2. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
			1. Threaded mortise cylinders with rings and cams to suit hardware application.
			2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
			3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
			4. Tubular deadlocks and other auxiliary locks.
			5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
			6. Keyway: Match Facility Standard.
		3. Removable Cores: Removable core cylinders are not allowed on UNL projects.
		4. Keying System: UNL Key Shop to cover all keying needs.
	7. KEY CONTROL
		1. Key Control Cabinet: No key control cabinets are used on UNL projects.
	8. MECHANICAL LOCKS AND LATCHING DEVICES
		1. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion-resistant steel case and be field-reversible for handing without disassembly of the lock body.
			1. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. The indicator is to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180-degree viewing angle with a protective covering to prevent tampering.
			2. Manufacturers:
				1. Sargent Manufacturing (SA) - 8200 Series.
				2. Schlage (SC) - L9000 Series.
		2. Multi-Point Locksets: ANSI/BHMA A156.37, Certified Products Directory (CPD) listed vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual-mounted outside lever trim controls available in a variety of ANSI/BHMA operational functions. The option for single top latching only eliminates the need for bottom strikes.
			1. Manufacturers:
				1. Sargent Manufacturing (SA) - 7000 Series.
				2. Schlage (SC) - LM9200 Series.
	9. ELECTROMECHANICAL LOCKING DEVICES
		1. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed, subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below and in the hardware sets.
			1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including outside door lock/unlock trim control, latch bolt and lock/unlock status monitoring, deadbolt monitoring, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.
			2. Energy Efficient Design: Provide lock bodies that have a holding current draw of 15mA maximum and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
			3. Manufacturers:
				1. Sargent Manufacturing (SA) - 8200 Series.
				2. Schlage (SC) - L9000 EL/EU/RX Series.
		2. Electromechanical Multi-Point Locks: Vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual-mounted outside lever trim controls available in a variety of ANSI/BHMA operational functions. The option for single top latching only eliminates the need for bottom strikes. Electromechanical options include solenoid-activated trim, electric latch retraction, and inside and outside lever monitoring.
			1. Energy Efficient Design: Provide lock bodies that have a holding current draw of 15mA maximum and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
			2. Manufacturers:
				1. Sargent Manufacturing (SA) - 7000 Series.
				2. Schlage (SC) – LM9200 Series.
	10. AUXILIARY LOCKS
		1. Push-Pull Latches, Paddle Type, Mortise: ANSI/BHMA A156.13, Series 1000, Operational and Security Grade 1 Certified Products Directory (CPD) listed mortise type push-pull locks and latches with ligature-resistant paddle trim capable of being mounted in vertical (up or down) and horizontal (sideways) positions. Locksets are to be manufactured with a corrosion-resistant, formed steel case and be non-handed, field-reversible for re-handing without disassembly of the lock body. Paddles and covers are manufactured from cast stainless steel or brass material. Provide optional lead-lining (lock body) and Torx® fasteners as specified in Hardware Sets.
			1. Manufacturers:
				1. Sargent Manufacturing (SA) - 8200 ALP Series.
				2. Schlage (SC) – HL6 Series.
	11. LOCK AND LATCH STRIKES
		1. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect the frame, finished to match door hardware set, unless otherwise indicated, and as follows:
			1. Flat-Lip Strikes: For locks with three-piece anti-friction latch bolts, as recommended by the manufacturer.
			2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
			3. Aluminum-Frame Strike Box: Provide the manufacturer's special strike box fabricated for aluminum framing.
		2. Standards: Comply with the following:
			1. Strikes for Mortise Locks and Latches: BHMA A156.13.
			2. Strikes for Bored Locks and Latches: BHMA A156.2.
			3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
			4. Dustproof Strikes: BHMA A156.16.
	12. ELECTRIC STRIKES
		1. Standard Electric Strikes: Electric strikes tested to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire-rated openings. Strikes shall be of stainless-steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of

1 million operating cycles. Provide strikes with 12 or 24 VDC capability, fail-secure unless otherwise specified. Where specified provide latch bolt and latch bolt strike monitoring indicating both the position of the latch bolt and the locked condition of the strike.

1. Manufacturers:
	1. HES (HS) – 1006/4500C Series.
	2. Von Duprin (VD) - 6200/6400 Series.
		1. Standard Electric Strikes: Electric strikes tested to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire-rated openings. Strikes shall be tested to a minimum of 1500 pounds of static strength and 70-foot pounds of dynamic strength with a minimum endurance of 500,000 operating cycles. Provide strikes with 12 or 24 VDC capability with field selectable fail-secure/fail-safe. Where specified provide latch bolt monitoring indicating both the position of the latch bolt and locked condition of the strike.
			1. Manufacturers:
				1. HES (HS) - 5000/5200 Series.
				2. Von Duprin (VD) - 4200/5100 Series.
	3. CONVENTIONAL EXIT DEVICES
		1. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
			1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by the manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
			2. Where exit devices are required on fire-rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult the manufacturer’s catalog and template book for specific requirements.
			3. Except on fire-rated doors, provide exit devices with a hex key dogging device to hold the push bar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
			4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
			5. Lever Operating Trim: Where exit devices require lever trim, furnish the manufacturer's heavy-duty escutcheon trim with threaded studs for thru bolts.
				1. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
				2. Where the function of the exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
			6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dustproof strikes where thermal pins are required to project into the floor.
			7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for a maximum of 2” wide stiles.
			8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
			9. Rail Sizing: Provide exit device rails factory-sized for proper door width application.
			10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
		2. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with a deadlock feature.
			1. Manufacturers:
				1. Sargent Manufacturing (SA) - 80 Series.
				2. Von Duprin (VD) - 99 Series.
		3. Extruded Aluminum Removable Mullions: ANSI/BHMA A156.3 anodized, removable mullions with malleable-iron top and bottom retainers. Mullions are to be provided standard with stabilizers and embedded weatherstrip.
			1. Manufacturers:
				1. Same as the exit device manufacturer.
		4. Tube Steel Removable Mullions: ANSI/BHMA A156.3 Removable steel mullions with malleable- iron top and bottom retainers and a primed paint finish.
			1. Provide keyed removable feature where specified in the Hardware Sets.
			2. Provide stabilizers and mounting brackets as required.
			3. Manufacturers:
				1. Same as the exit device manufacturer.
	4. ELECTROMECHANICAL EXIT DEVICES
		1. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to the same compliance standards and requirements as mechanical exit devices. Electrified exit devices are to be of type and design as specified below and in the hardware sets.
			1. Energy Efficient Design: Provide devices that have a holding current draw of 15mA maximum and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
			2. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors that have a maximum current draw of 600mA. Solenoid-driven latch retraction is not acceptable.
			3. Manufacturers:
				1. Sargent Manufacturing (SA) - 80 Series.
				2. Von Duprin (VD) – QEL 99 Series.
	5. DOOR CLOSERS
		1. All door closers specified herein shall meet or exceed the following criteria:
			1. General: Door closers are to be from one manufacturer, matching in design and style, with the same type of door preparations and templates regardless of application or spring size. Closers are to be non-handed with full-sized covers.
			2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire-rated doors.
			3. Size of Units: Comply with the manufacturer's written recommendations for sizing door closers depending on the size of the door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
			4. Closer Arms: Provide heavy-duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
			5. Closers shall not be installed on the exterior or corridor side of doors, where possible install closers on doors for optimum aesthetics.
			6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers, and drop plates as required for proper installation. Provide through-bolt on all wood doors as specified in the hardware sets.
		2. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy-duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one-piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
			1. Manufacturers:
				1. LCN Closers (LC) - 4040XP Series.
				2. Sargent Manufacturing (SA) - 351 Series.
	6. ELECTROHYDRAULIC DOOR OPERATORS
		1. General: Provide low-energy operators of the size recommended by the manufacturer for door size, weight, and movement; for the condition of exposure; and compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
			1. Fire-Rated Doors: Provide door operators with fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
		2. Standard: Certified ANSI/BHMA A156.19.
		3. Performance Requirements:
			1. Opening Force if Power Fails: Not more than 15 lbs. is required to release a latch if provided, not more than 30 lbs. is required to manually set the door in motion, and not more than 15 lbs. is required to fully open the door.
			2. Entrapment Protection: Not more than 15 lbs. is required to prevent the stopped door from closing or opening.
		4. Configuration: Surface-mounted door operators to control single swinging and pair of swinging doors.
		5. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guidelines. Provide a time delay for the door to remain open before initiating the closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, the door operator functions as a manual door closer with fully adjustable opening and closing forces, with or without electrical power.
		6. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.
		7. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors, and specified auxiliary contacts.
		8. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
		9. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

# See 087113.

* + - 1. Record (RE) – 8100 Series Preferred
			2. Norton Door Controls (NO) - 6000 Series.
	1. ARCHITECTURAL TRIM
		1. Door Protective Trim
			1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
			2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on the stop side of single doors and 1” LDW on the stop side of pairs of doors, and not more than 1" less than door width on the pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
			3. Where plates are applied to fire-rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
			4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
				1. Stainless Steel: 300 grade, 050-inch thick.
			5. Options and fasteners: Provide the manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
			6. Manufacturers:
				1. IVES (IV).
				2. Burns Manufacturing (BU).
				3. Hiawatha, Inc. (HI).
				4. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
	2. DOORSTOPS AND HOLDERS
		1. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
		2. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, no floor stops allowed. Where wall bumpers are not appropriate, provide overhead-type stops and holders.
			1. Manufacturers:
				1. IVES (IV).
				2. Burns Manufacturing (BU).
				3. Hiawatha, Inc. (HI).
				4. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
		3. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
			1. Manufacturers:
				1. IVES (IV).
				2. Rixson Door Controls (RF).
				3. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
				4. Sargent Manufacturing (SA).
	3. ARCHITECTURAL SEALS
		1. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
		2. 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 UL 1784.
			1. Provide smoke-labeled perimeter gasketing at all smoke-labeled openings.
		3. 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-10C.
			1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
		4. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
		5. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by the manufacturer.
		6. Manufacturers:
			1. National Guard Products (NG).
			2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
			3. Reese Enterprises, Inc. (RE).
	4. ELECTRONIC ACCESSORIES
		1. Exit Delay Locking Systems: Devices to be used must be integrated into hardware panics, with electronics being located within the panic housing. Operates on either 12VDC or 24VDC.
			1. Manufacturers:
				1. Sargent Manufacturing (SA) - 80 Series. Option 59-Delayed Egress
				2. Von Duprin (VD) – CX-99 Series. Chexit.
		2. Request-to-Exit Motion Sensor: Motion sensors are not to be used.
		3. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface-mounted models include a wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
			1. Manufacturers:
				1. Security Door Controls (SD) - DPS Series.
				2. Securitron (SU) - DPS Series.
		4. Power is provided through UNL Access Control Systems.
	5. FABRICATION
		1. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers' recognized installation standards for application intended.
	6. FINISHES
		1. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
		2. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
		3. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

**PART 3 - EXECUTION**

* 1. EXAMINATION
		1. Examine scheduled openings, with the Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
		2. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.
	2. PREPARATION
		1. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
		2. Wood Doors: Comply with ANSI/DHI A115-W series.
	3. INSTALLATION
		1. Install each item of mechanical and electromechanical hardware and access control equipment to comply with the manufacturer's written instructions and according to specifications.
			1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including hanging devices; locking devices; closing devices; and seals.
		2. Mounting Heights: Mount door hardware units at heights indicated in the following applicable publications, unless specifically indicated or required to comply with governing regulations:
			1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
			2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
			3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
			4. Provide blocking in drywall partitions where wall stops or other wall-mounted hardware is located.
		3. Retrofitting: Install door hardware to comply with the manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
		4. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
		5. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.
	4. FIELD QUALITY CONTROL
		1. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
			1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.
	5. ADJUSTING
		1. 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.
	6. CLEANING AND PROTECTION
		1. Protect all hardware stored on the construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install all hardware at the latest possible time frame.
		2. Clean adjacent surfaces soiled by door hardware installation.
		3. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at the time of owner occupancy.
	7. DOOR HARDWARE SETS
		1. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware, and missing items should be brought to the attention of the architect with corrections made before the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
			1. Quantities listed are for each pair of doors, or each single door.
			2. The supplier is responsible for handling and sizing all products.
			3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
		2. Manufacturer’s Abbreviations:
			1. MK – McKinney
			2. IV – IVES Hardware
			3. SO - SOSS Invisible Hinges
			4. PE - Pemko
			5. SU - Securitron
			6. RF - Rixson
			7. RO - Rockwood
			8. SA - SARGENT
			9. SC – Schlage
			10. HS – HES
			11. AD - Adams Rite
			12. RE - RECORD Auto Operators
			13. LU - Lund Equipment Co
			14. OT - Other