SECTION 08110
STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Standard steel doors and frames.
2. Assemblies for fire-rated openings.

B. Related Sections:

1. Door hardware: Elsewhere in Division 8.
2. Painting: Division 9.

1.02 REFERENCES

A. SDI 100-1991 -- Recommended Specifications: Standard Steel Doors and Frames; Steel Door Institute; 1991.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's printed product information indicating compliance with specified requirements.

B. Shop Drawings: Submit drawings for fabrication and installation of steel doors and frames, including the following information:

1. Details of construction, joints, and connections.
2. Details of each frame type, including anchorage.
3. Elevations of each opening type.
4. Conditions at openings, including coordination with glass and glazing requirements.
5. Location and installation requirements of door hardware and reinforcements.
6. Schedule of openings coordinated with numbering system used in contract documents.

C. Quality Assurance Certification: Submit manufacturer's certification that products have been constructed and tested in full compliance with ANSI/SDI 100. As applicable, include test reports for core construction and reinforcing methods not specifically designated as acceptable by ANSI/SDI 100.

1.04 QUALITY ASSURANCE

A. Quality Standard: Comply with SDI 100.

B. Labeled Assemblies: At all locations where fire-rated door and frame assemblies are required, provide assemblies which comply with NFPA 80 and have been tested and labeled in accordance with ASTM E 152 by agency acceptable to governing authorities.

C. Coordination: Transmit copy of final shop drawings to wood door manufacturer to allow prefitting of wood doors to steel frames.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in crates or cartons suitable for storage at the site.

B. Replace items damaged in delivery, unless damage is minor and can be repaired to match intact items, as determined by the Architect.

C. Store products under cover, raised above ground level, and stacked to prevent warping and to promote air circulation.

1. Prevent moisture from accumulating and remove saturated packaging before products can be damaged.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Provide products complying with requirements of the contract documents and made by one of the following:

1. Allied Steel Products, Inc.
2. Amweld Building Products, Inc.
3. Ceco Door Products, a Division of United Dominion.
4. Copco Door Company.
5. Mesker Door, Inc.
6. Pioneer Industries Division/CORE Industries, Inc.
7. Republic Builders Products Division/DESCO.
8. Steelcraft Manufacturing Company/Masco Industries.

2.02 MATERIALS

A. Steel Sheets, Galvanized: ASTM A 591, electrolytic zinc-coated, Class A, mill phosphatized.

B. Anchorages: Galvanized steel, minimum 18 gage.

C. Fasteners and Inserts: Units standard with manufacturer.

1. Exterior walls: ASTM A 153, hot-dip galvanized, Class C or D.

D. Paint:

1. Primer: Manufacturer's standard rust-inhibitive coating, suitable to receive finish coatings specified.

2.03 FABRICATION

A. General: Shop-fabricate assemblies to greatest extent possible, assuring that installed units will be without warp, twist, bow, or other defect in appearance or function.

B. Exposed Door Faces: Fabricate from cold-rolled steel.

C. Frames: Fabricate from cold-rolled or hot-rolled steel.

D. Edge Channels, Stiffeners, and Reinforcement: Fabricate from cold-rolled or hot-rolled steel.

E. Exterior Doors: Fabricate from electrolytic galvanized steel.

F. Seal top and bottom edges integrally with door construction, or use minimum 16 gage steel channels to form flush closure.

G. Exterior Frames: Fabricate from galvanized steel.

H. Exposed Screws and Bolts: Where required, provide only countersunk, flat Phillips-head fasteners.

I. Insulated Assemblies: At locations scheduled, provide insulating door and frame assemblies which have been tested in accordance with ASTM C 236 for thermal resistance.

1. U-value: 0.24 BTU per hour per square foot per degree F, minimum.

J. Hardware Preparation: Comply with DHI A115 series specifications for door and frame preparation, using final hardware schedule and templates from hardware supplier.

1. Reinforcement: Reinforce doors and frames for field-installed exposed hardware items.
2. Locations: Comply with final shop drawings.

K. Shop Painting:

1. Preparation: Clean surfaces thoroughly before beginning painting operations, removing rust, scale, oil, grease, and other contaminants.
2. Primer: Apply primer evenly to achieve full protection of all exposed surfaces.

L. Exposed Screws and Bolts: Where required, provide only countersunk, flat Phillips-head fasteners.

M. Insulated Assemblies: At locations scheduled, provide insulating door and frame assemblies which have been tested in accordance with ASTM C 236 for thermal resistance.

1. Maximum U-value: 0.24 BTU per hour per square foot per degree F.

N. Hardware Preparation: Comply with DHI A115 series specifications for door and frame preparation, using final hardware schedule and templates from hardware supplier.

1. Reinforcement: Reinforce doors and frames for field-installed exposed hardware items.
2. Locations: Comply with final shop drawings.

O. Shop Painting:

1. Preparation: Clean surfaces thoroughly before beginning painting operations, removing rust, scale, oil, grease, and other contaminants.
2. Primer: Apply primer evenly to achieve full protection of all exposed surfaces.

2.04 STEEL DOORS

A. General: Fabricate steel doors in accordance with requirements of SDI 100.

B. Exterior Doors:

1. Grade III - Extra Heavy-Duty, Model 1A - Full Flush (14 gage).

2.05 STEEL FRAMES

A. General: Fabricate steel frames for scheduled openings, in styles and profiles as shown, using concealed fasteners.

1. Minimum thickness: 16 gage interior; 14 gage exterior.
2. Construction: Mitered and welded corners.

B. Door Silencers: Drill stops to receive silencers.

1. Provide 3 silencers on strike jambs of single-swing frames.
2. Provide 2 silencers on heads of frames for pairs of doors.
3. Provide for 2 silencers on heads of frames for double egress doors.

C. Guards: Weld protective covers to back of hardware openings at locations where grout, plaster, or other materials might interfere with hardware operation.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install steel doors, frames, and accessories to comply with manufacturer's recommendations.

1. Comply with detailed installation requirements of final shop drawings.

B. Frame Installation:

1. General: Adhere to provisions of SDI 105.

2. Place welded frames prior to construction of enclosing elements, braced securely to achieve plumb, planar installation. Remove braces after anchorages have achieved final set, leaving frames in smooth, undamaged condition.

3. Anchors: Provide 3 wall anchors per jamb at hinge and strike levels and minimum 18 gage base anchors.

4. Openings at in-place masonry: Fasten frames securely to masonry with machine screws and masonry anchorages.

5. Fire-rated openings: Comply with requirements of NFPA 80.

6. Metal stud partitions: Attach wall anchors to stud framing with tapping screws.

C. Fill all door frames with grout at all locations.

D. Door Installation:

1. General: Comply with requirements and clearances specified in SDI 100.

2. Fire-rated doors: Comply with NFPA 80 requirements and clearances.

E. Fixed Panel Installation:

1. Install fixed panels with concealed fasteners.

3.02 ADJUST AND CLEAN

A. Touch-Up: At locations where primer has been abraded or minor rusting has occurred, sand smooth and spray-apply compatible primer.

B. Final Operating Adjustments: Check hardware at all openings for proper operation of doors, making final corrections as required to assure that work of this section is complete and undamaged.

END OF SECTION 08110

SECTION 08331
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 SCOPE

A. Overhead coiling doors, operating hardware, exterior, electric operation.

B. Wiring from electric circuit disconnect to operator to control station.

1.02 RELATED REQUIREMENTS

A. Section 09900 - Paints and Coatings: Field paint finish.

B. Section 13851 - Fire Alarm System: Fire alarm interconnection.

C. Section 16155 - Equipment Wiring: Power to disconnect.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2010.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.

C. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC; National Electrical Manufacturers Association; 2000 (R2005).

D. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2009, Revision 1 - 2010.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide general construction, component connections and details, electrical equipment, .

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

D. Samples: Submit two slats, 12" x 12" inch in size illustrating shape, color and finish texture.

E. Manufacturer's Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.

F. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

1.05 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Doors:

1. Overhead Door Company
2. Cornell Iron Works, Inc: www.cornelliron.com.
3. The Cookson Company: www.cooksondoor.com.
4. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com.

2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.

1. Capable of withstanding positive and negative wind loads of 20 psf, without undue deflection or damage to components.
2. Sandwich slat construction with insulated core of ridged Polyisocyanurate type insulation; insulation (u-) value: 0.50 BTU/hr sq ft deg F.
   a. Front slat 22 ga.; back slat 24 ga.
3. Nominal Slat Size: 2 inches wide x required length.
4. Finish: Factory painted, color as selected.
5. Guides: Angles; galvanized steel.
6. Hood Enclosure: As indicated; aluminum.
7. Electric operation.
8. Mounting: As indicated.

2.03 MATERIALS

A. Curtain Construction: Interlocking slats.

1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
3. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.

B. Steel Slats: Minimum 18 gage ASTM A653/A653M galvanized steel sheet.

C. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.

D. Steel Guides: Formed from galvanized steel sheet, complying with ASTM A653/A653M.

1. Galvanizing: Minimum G90/Z275 coating.

E. Hood Enclosure: Internally reinforced to maintain rigidity and shape.

1. Minimum 22 gage.
2. Prime paint with polyester top coat.

F. Hardware:

1. Lock Cylinders: Specified in Section 08710.

G. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

2.04 ELECTRIC OPERATION

A. Electric Operators:

1. Mounting: Side mounted.
2. High starting torque, reversible, constant duty, Class A insulated; overload protected; sized to operate door between 2/3 foot per second and 1 foot per second.
3. Motor Enclosure:
   a. Exterior doors: NEMA MG 1 Type 4; TEFC.
4. Motor Rating: 3/4 hp; continuous duty.
5. Motor Controller: NEMA ICS 6, full voltage, reversing magnetic motor starter.
6. Controller Enclosure: NEMA 250 Type 1.
7. Opening Speed: 9 to 12 inches per second.
8. Coordinate motor electric service criteria with building electrical supply.
9. Brake: Adjustable friction clutch type, activated by motor controller.
10. Manual override in case of power failure.

B. Control Station: Standard three button (OPEN-STOP-CLOSE) momentary control for each operator.

1. 24 volt circuit.
2. Mometary-contact, 3 button, labeled OPEN, CLOSE, and STOP.

C. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to reverse operator upon striking object, hollow neoprene covered.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Coordinate installation of electrical service with Section 16155.

F. Complete wiring from disconnect to unit components.

G. Complete wiring from fire alarm system.

H. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.

I. Install perimeter trim and closures.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION 08331

SECTION 08710
FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Section 08110 – Hollow Metal Doors and Frames.
2. Section 08810 – Glass and Glazing.
3. Section 09900 – Painting and Coating.

D. 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. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.03 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of 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 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:
   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.
4. Submittal Sequence: Submit the final Door Hardware Schedule at 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.

C. Proof of Certification: Provide copy of manufacturer(s) official certification or accreditation document indicating proof of status as a qualified and authorized provider of the primary Integrated Wiegand Access Control Products.

D. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

E. Informational Submittals:

1. LEED Submittals: Manufacturer's product information and applicable sustainability program credits that are available to contribute towards a LEED rated project certification.
   a. Credit MR 4.1 and 4.2: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and pre-consumer recycled content by

weight for each Product specified under this Section. Use materials with recycled content such that the sum of the post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4.1 (total of 20% based on cost) of the total values of the material in the project as follows:

i) Floor Closers: 63%
ii) Pivots: 78%
iii) Cylindrical Locks: 58%
iv) Mortise Locks: 57%
v) Exit Devices: 54%
vi) Door Closers: 51%
vii) Overhead Stops: 46%

b. Low-Emitting Materials EQ 4.2: Provide products that reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants; products shall not produce VOC emissions.

2. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

G. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.04 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 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.

B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders 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.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years 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 in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier 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.

E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:

1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," 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:
      i) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      ii) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
   c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
3. NFPA 101: Comply with the following for means of egress doors:
   a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
   b. Thresholds: Not more than 1/2 inch high.
4. 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 NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
   a. Test Pressure: Positive pressure labeling.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. 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. Prior to installation of door hardware, arrange for manufacturers' representatives to hold 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 sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. 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.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.06 COORDINATION

A. 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.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) 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.

1.07 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship

within 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 systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Ten years for manual door closer bodies.

1.08 MAINTENANCE SERVICE

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

B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

1. 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:
   a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
2. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
   a. Permanent cylinders, cores, and keys to be installed by Owner.

B. 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 architect, owner, and their designated consultants.

2.02 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. 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:
   a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
   b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing hinges unless Hardware Sets indicate heavy weight.
   c. Tornado Resistant Assemblies: At a minimum, provide heavy weight hinges with stainless steel screws used in accordance with and specified as part of a Severe Storm Shelter Opening meeting ICC 500 and FEMA 361.
4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
   a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
      i) Out-swinging exterior doors.
      ii) Out-swinging access controlled doors.
5. Acceptable Manufacturers:
   a. McKinney Products (MK), or equal.

2.03 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable. Provide related

accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

1. Acceptable Manufacturers:
   a. Rockwood Manufacturing (RO).
   b. Trimco (TC).
   c. Or equal.

2.04 CYLINDERS AND KEYING

A. General: All lock and cylinder housings shall accept Best SFIC 7-pim permanent cylinders.

B. Keying System: Owner will coordinate permanent cores directly with manufacturer's representative. Provide temporary removable cores at all exterior, mechanical room and storage room openings.

C. Key Quantity: Provide the following minimum number of keys:

1. Construction Control Keys: Two (2)
2. Construction keys: Five per building.

2.05 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.

1. Acceptable Manufacturers:
   a. Sargent Manufacturing (SA) – 9200 Series or 8200 Series as scheduled, or equal.

B. Lock Trim Design: As specified in Hardware Sets.

2.06 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

B. 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 A156.5.
4. Dustproof Strikes: BHMA A156.16.

2.07 CONVENTIONAL EXIT DEVICES

A. 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 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 manufacturer's catalog and template book for specific requirements.
   a. Fire Exit Removable Mullions: Provide keyed removable mullions for use with 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 UL 305 and NFPA 252. Mullions to be used only with exit devices for which they have been tested.
3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
4. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.
   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.
   b. Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.
6. Vertical Rod Exit Devices: Provide and install interior surface and concealed vertical rod exit devices as Less Bottom Rod (LBR) unless otherwise indicated.
7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 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.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness. Painted or aluminum metal rails are not acceptable. Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.

1. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
   b. Sargent Manufacturing (SA) - 80 Series.
   c. Or equal.

C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish. Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets. At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.

1. Acceptable Manufacturers:
   a. Corbin Russwin Hardware (RU) - 700/900 Series.
   b. Sargent Manufacturing (SA) - 980S Series.
   c. Or equal.

2.08 DOOR CLOSERS

A. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade 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 or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units with high impact, non-corrosive plastic covers standard.

1. Acceptable Manufacturers:
   a. Sargent Manufacturing (SA) - 1431 Series, or equal.

2.09 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. 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, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Acceptable Manufacturers:
   a. Rockwood Manufacturing (RO).
   b. Trimco (TC).
   c. Or equal.

2.10 ARCHITECTURAL SEALS

A. 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.

B. 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.

C. 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 UBC 7-2, Fire Tests of Door Assemblies.

D. 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.

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

F. Acceptable Manufacturers:

1. Pemko Manufacturing (PE).
2. Reese Enterprises, Inc. (RS).
3. Or equal.

2.11 FABRICATION

A. 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.

2.12 FINISHES

A. 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.

B. 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.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. 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.

3.02 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

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

3.03 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with 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.

B. Mounting Heights: Mount door hardware units at heights indicated in 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.

C. Retrofitting: Install door hardware to comply with 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 substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. 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.

3.04 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.05 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.

3.06 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.07 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.08 DOOR HARDWARE SCHEDULE

A. 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 prior to 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.

B. Refer to Section 080671, Door Hardware Schedule, for hardware sets.

C. Manufacturer's Abbreviations:

1. MK - McKinney
2. SA - Sargent
3. RO - Rockwood

4. BE - Stanley Security Solutions Inc (BE)
5. PE - Pemko

Hardware Schedule

JET MIX PUMP STATION
Set: A
Doors: 101, 102
Description: Exterior Entry/Exit - NEC

3	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Exit Device	72-7P 8804 PSB	US32D	SA
1	Combinated Permanent Core	1E-7 as required	626	BE
1	Door Closer	SRI 1431 CPSH	EN	SA
1	Threshold	1715AK WS10SS		PE
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
1	Sweep	315CN		PE
1	Rain Guard	346C		PE

Set: B
Doors: 105
Description: Exterior Pair

6	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
2	Flush Bolt	555	US26D	RO
1	Mortise Lock	3 72-7P 76 9250 LNJ LC	US32D	SA
1	Combinated Permanent Core	1E-7 as required	626	BE
2	Door Closer	SRI 1431 CPSH	EN	SA
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
2	Sweep	315CN		PE
1	Rain Guard	346C		PE
1	Gasketing	S88D		PE

Notes: Overlapping astragal by door manufacturer.

Set: C
Doors: 106
Description: Exterior

3	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Mortise Lock	3 72-7P 76 9250 LNJ LC	US32D	SA
1	Combinated Permanent Core	1E-7 as required	626	BE
1	Door Closer	SRI 1431 CPS	EN	SA
1	Threshold	1715AK WS10SS		PE
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
1	Sweep	315CN		PE
1	Rain Guard	346C		PE

Set: D
Doors: 107
Description: Exterior

3	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Mortise Lock	3 72-7P 76 9250 LNJ LC	US32D	SA
1	Combinated Permanent Core	1E-7 as required	626	BE
1	Door Closer	1431 O	EN	SA
1	Threshold	1715AK WS10SS		PE
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
1	Sweep	315CN		PE
1	Rain Guard	346C		PE
1	Sweep	345C		PE

Set: E
Doors: 103
Description: Privacy - Toilet

3	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Privacy Set	49 8265 LNJ	US32D	SA
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Set: F
Doors: 104
Description: Overhead Door

1	SFIC Cylinder	1E-72	626	BE
1	Combinated Permanent Core	1E-7 as required	626	BE

Notes: Balance of hardware by door manufacturer.
Verify cylinder type and quantity with door manufacturer.

DIVERSION PUMP STATION
Set: 1.0
Doors: 100
Description: Exterior Entry/Exit - NEC

3	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Exit Device	72-7P 8804 PSB	US32D	SA
1	Combinated Permanent Core	1E-7 as required	626	BE
1	Door Closer	SRI 1431 CPSH	EN	SA
1	Threshold	1715AK WS10SS		PE
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
1	Sweep	315CN		PE
1	Rain Guard	346C		PE

Set: 2.0
Doors: 101
Description: Exterior Entry/Exit Pair - NEC

6	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Removable Mullion	L980S	PCSA	
1	Exit Device	72-7P 8804 PSB	US32D	SA
1	Exit Device (exit only)	LD 8810	US32D	SA
1	SFIC Cylinder	1E-72	626	BE
2	Combinated Permanent Core	1E-7 as required	626	BE
2	Door Closer	SRI 1431 CPSH	EN	SA
1	Threshold	1715AK WS10SS		PE
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
2	Sweep	315CN		PE
1	Rain Guard	346C		PE
1	Astragal	S771D		PE

Set: 3.0
Doors: 102, 103
Description: Exterior

3	Hinge	TA2314 SSF NRP 4-1/2" x 4-1/2"	US32D	MK
1	Mortise Lock	3 72-7P 76 9250 LNJ LC	US32D	SA
1	Combinated Permanent Core	1E-7 as required	626	BE
1	Door Closer	SRI 1431 CPS	EN	SA
1	Threshold	1715AK WS10SS		PE
2	Jamb Gasketing	290AS		PE
1	Head Gasketing	2891AS		PE
1	Sweep	315CN		PE
1	Rain Guard	346C		PE

END OF SECTION 08710