

SECTION 08113

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Standard and custom hollow metal doors and frames.
- 2. Steel sidelight, borrowed lite and transom frames.
- 3. Louvers installed in hollow metal doors.
- 4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

- 1. Division 01 Section "General Conditions".
- 2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
- 3. Division 08 Section "Flush Wood Doors".
- 4. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
- 5. Division 08 Section "Door Hardware".
- 6. Division 08 Section "Access Control Hardware".
- 7. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- 2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
- 3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- 4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- 5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
- 6. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
- 7. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- 8. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

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9. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
10. 10. SDI-113 Standard Practice for Determining the Steady-State Thermal Transmittance of Steel Door & Frame Assemblies.
11. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
12. ASTM C1199 - Standard Test Method for Measuring the Steady-State Thermal Transmittance of Fenestration Systems Using Hot Box Methods
13. ASTM E1423 - Practice for Determining Steady State Thermal Transmittance of Fenestration Systems.
14. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
15. ASTM E1332 - Standard Classification for Determination of Outdoor-Indoor Transmission Class.
16. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
17. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
18. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
19. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
20. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
21. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
22. FEMA P-361 2015/2021 - Design and Construction Guidance for Community Safe Rooms.
23. ICC 500 - 2014/2020 ICC/NSSA Standard for the Design and Construction of Storm Shelters.
24. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
25. TAS-201-94 - Impact Test Procedures.
26. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
27. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
28. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
29. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Maintenance manual must be provided for tornado/hurricane storm shelter impact protective systems.
- C. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- D. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

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4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

E. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

F. Informational Submittals:

1. Hurricane Resistant Openings: Exterior hurricane opening assemblies to be tested according to ASTM E330, ASTM E1886, ASTM E1996, TAS 201, TAS 202, and TAS 203 standards, and certified by a qualified independent third party testing agency acceptable to authority having jurisdiction, with labeling indicating compliance with the design pressure level and debris impact resistance requirements specified for the Project.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to ICC 500 (2014/2020), ICC/NSSA Standard for the Design and Construction of Storm Shelters.

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1. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

- F. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
1. CECO Door Products (C).
 2. Curries Company (CU).

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.
 2. Core Construction: Manufacturer's standard polystyrene. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value of 2.8 or better.
 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
 4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
 6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.

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2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

D. Manufacturers Basis of Design:

1. Curries Company (CU) - Polystyrene Core - 707 Series.

2.4 HOLLOW METAL DOOR AND SHUTTER ASSEMBLIES FOR STORM SHELTERS

A. General: Provide complete tornado or hurricane storm shelter resistant assemblies constructed, test, and listed/labeled to resist the design pressures for components and cladding and missile impact resistance as described in ICC 500 (2014/2020), ICC/NSSA Standard for the Design and Construction of Storm Shelters.

1. Door and shutter systems, tested and complying with ICC 500 (2014/2020) and FEMA P-361 (2015/2021), Design and Construction Guidance for Community Safe Rooms and supported by third party test results.
2. Sheets fabricated on exterior openings from commercial quality hot dipped zinc coated steel complying with ASTM A924 A60. Gauges to be in accordance with manufacturers tested assemblies.
3. Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
4. Top Edge: Reinforce top of doors with a continuous steel channel extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached and welded in place with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

B. Manufacturers Basis of Design:

1. CECO Door Products (C) - StormPro Series.
2. Curries Company (CU) - StormPro Series.

2.5 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

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- B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. Curries Company (CU) - M Series.
- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. Curries Company (CU) - CM Series.
 - b. Curries Company (CU) - M Series.
- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.6 FRAMES FOR STORM SHELTERS

- A. General: Subject to the same compliance standards and requirements as standard hollow metal frames, provide complete tornado or hurricane storm shelter resistant assemblies tested and labeled as complying with ICC 500 (2014/2020) and FEMA P-361 (2015/2021) and supported by third party test listings.
 - 1. Fabricate exterior frames from 14 gauge hot dipped zinc coated steel that complying with ASTM designations A924 A60.
 - 2. Manufacturers Basis of Design:
 - a. CECO Door Products (C) - StormPro Series.
 - b. Curries Company (CU) - StormPro Series.

2.7 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 - 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
 - 4. Hurricane Opening Anchors: Types as tested and required for indicated wall types to meet specified design pressure and impact rating criteria.

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- 5. Storm Shelter Anchors: Masonry T-shaped, wire masonry type, or existing opening type anchors as per manufacturers listing or anchor detail sheets including welded installation methods.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.8 LOUVERS

- A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
 - 1. Blade Type: Vision proof inverted V or inverted Y.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.
- B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
 - 1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.9 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.10 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

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2.11 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 - 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 - 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- D. Hollow Metal Frames:
 - 1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
 - 3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
 - 5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
 - 6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
 - 7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
 - 8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - 9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on-center and as follows:

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- 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
 - c. Storm Shelter Openings: Provide jamb, head, and sill anchors in accordance with manufacturer's certified assembly listings.
 10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
 11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.12 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

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PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.
- E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

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1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

- A. 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.

END OF SECTION 08113

SECTION 08210
WOOD DOORS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Wood doors, fire rated and anon-rated.

1.02 REFERENCES

- A. ANSI/NWMA I.S.1 - Industry Standard For Wood Flush Doors (Includes Standards I.S.1.1 through I.I.S.1.7).
- B. ANSI A135.4 - Basic Hardboard.
- C. ASTM E90 - Measurement of Airborne Sound Transmission Loss of Building Partitions.
- D. ASTM A152 - Methods of Fire Tests of Door Assemblies.
- E. AWI - Quality Standards of Architectural Woodwork Institute.
- F. NFPA 80 - Fire Doors and windows.
- G. NFPA 252 - Standard Method of Fire Tests for Door Assemblies.
- H. UL 10B - Fire Tests of Door Assemblies.

1.03 DESCRIPTION OF WORK

- A. Extent and location of each type of wood door is shown on Drawings and in schedules.
- B. Types of doors required include the following:
 - 1. Solid core flush wood doors with veneer faces.

1.04 QUALITY ASSURANCE

- A. Conform to requirements of AWI Quality Standard Section 1300 and 1400 Premium Grade. ANSI/NWMA I.S.1.
- B. Fire Door Construction: Conform to ASTM E152, NFPA 252, and UL 10B.
- C. Installed Doors: Conform to NFPA 80 "Standard for Fire Doors and Windows" and which have been tested and rated with single point hardware by UL.
- D. Non-Fire Rated Wood Doors: NWMA Industry Standard I.S.-1 "Wood Flush Doors" of the National Woodwork Manufacturer's Association.
- E. Factory mark each door with NWMA "Quality Certified" Seal of Approval for conformance with NWMA I.S.-1.
- F. Provide UL label on each fire-rated door and panel.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable building codes for fire rated doors and panels.

1.06 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01300.
- B. Indicate door elevations, stile and rail reinforcement, internal blocking for hardware attachment, and cutouts for glazing and louvers. As applicable per drawings.
- C. Specific Product Warranty: Submit written agreement in door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show photographing of construction below in face veneers, or do not conform to tolerance limitations of NWMA.

The warranty shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors.

Warranty shall be in effect during following periods of time after date of substantial completion.

Solid Core Flush Interior Doors: Five years.

- D. Submit manufacturer's certificate under provisions of Section 01400 that doors and louvers meet or exceed specified fire rated requirements.
- E. Submit samples of **wood stain for approval**.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect wood doors during transit storage and handling to prevent damage, soiling and deterioration. Comply with the "On-Site Care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 DOOR TYPES

- A. Flush Interior Doors: 1 3/4 inches thick; solid core construction; wood veneer faces, fire rated as indicated.

2.02 DOOR AND PANEL CONSTRUCTION AWI QUALITY Standard

- A. Solid, Non-Rated Core: AWI Section 1300, PC-7 (Minimum).
- B. Solid, Fire Rated Core: AWI Section 1300, as required per Drawings.

2.03 FLUSH DOOR FACING

- A. Facing Quality: AWI premium.
- B. Flush Interior Door Veneer: Red Oak species wood, plain sliced with pair matched grain, for **transparent finish as SELECTED BY ARCHITECT**.

2.04 ADHESIVES

- A. Interior Doors: AWI, ANSI/NWMA, Type II.

2.05 ACCESSORIES

- A. Glass Stops: Rolled metal type designed to conform to UL requirements.
- B. Provide 5" x 12" lock block for exit devices, closers, and mortise locks.

2.06 FABRICATION

- A. Fabricate non-rated doors in accordance with AWI Quality Standards requirements.
- B. Fabricate fire rated doors in accordance with AWI Quality Standards and to UL requirements. Attach fire rating label to door edge.
- C. Provide flush doors with 1/2 inch thick edge strips of wood species to match face veneer.
- D. Premachine doors for finish hardware.
- E. Provide Z- or T- shaped metal astragels in one piece to UL requirements for double fire doors to rating required.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Machine cut relief for hinges and closers and coring for handsets and cylinders.
- C. Trim door width by cutting equally on top and bottom edges to a maximum of 3/16 inch.
- D. Trim door height by cutting equally on top and bottom edges to a maximum of 3/4 inch. Trim fire door height at bottom edge only, to a maximum of one inch.
- E. Pilot drill screw and bolt holes.
- F. Prepare doors to receive finish hardware in accordance with AWI requirements.
- G. Install door louvers as instructed per plans.

3.02 INSTALLATION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.03 ADJUSTING AND CLEANING

- A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08305
ACCESS PANELS
(ACCESS DOORS)

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Cold rolled steel access doors (panels) and frames as required per Construction Documents.
- B. Two feet x two feet.
- C. Wall access panels .

1.02 SUBMITTALS

- A. Submit product data under provisions of Section 01300.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. For the purpose of establishing quality and type products by ACUDOR Products, Inc.: AS-9000 -Fully Gasketed have been specified.
- B. Equal products by Larsen's and The Williams Bros. Corp. Of America are approved for bidding.
- C. Substitutions : Under provisions of Section 01600 and Instructions to Bidders.

2.02 FABRICATION - WALLS AND CEILING ACCESS - FLUSH PANEL (All Locations unless noted otherwise.)

- A. Fabricate frames , panels, and flanges of 16 gauge cold rolled steel.
- B. Hinge: Concealed pivoting rod.
- C. Hardware: screw driver slot, quarter turn cam lock.
- D. Finish: 5 stage phosphate with prime coat of white to receive paint finish. Paint per Section 09900.
- E. Size: 24 inches square unless noted otherwise.
- F. Location:
 - 1. Locate a minimum of **one access panel per room** at all new monolithic gypsum board ceilings.
 - 2. Provide access panel in walls as required to access valves, dampers, electrical devices, etc.

2.03 FABRICATION - WALLS AND CEILING ACCESS - RECESSED DOOR PANEL (Only as noted specified in particular rooms .)

- A. Fabricate frames and flanges of 16 gauge cold rolled steel.
- B. Hinge: Concealed pin type.
- C. Hardware: screw driver slot, quarter turn cam lock.
- D. Finish: Phosphate dipped gray primed to receive paint finish. Paint per Section 09900.
- E. Size: 24 inches square unless noted otherwise.
- F. Location: **As Indicated on Drawings or as specified herein.**
- G. Door Pane: 16 gauge cold rolled steel.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify rough openings for access and units are correctly sized and located.
- B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install plumb and level in wall or ceiling opening openings.
- B. **Position to provide convenient access to concealed work requiring access at walls and ceiling. Coordinate in field with all mechanical and electrical items. Do not locate above ductwork, electrical conduit, lights , etc. Provide clean vertical path to door.**
- C. Install and secure rigidly in place in accordance with manufacturer's instructions.
- D. Coordinate with metal framing spacing.

END OF SECTION

SECTION 08361
SECTIONAL OVERHEAD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Commercial sectional doors.
- B. Electric Operators

1.2 RELATED SECTIONS

- A. Metal Fabrications: Miscellaneous for steel supports.
- B. Rough Carpentry. Door opening jamb and head members
- C. Door Hardware: Hardware, locks, access panels.
- D. Painting: Field painting.
- E. Parking Control Equipment: Parking control equipment for remote door controls.
- F. Common Work Results for Electrical.

1.3 REFERENCES

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- D. ANSI/DASMA 105 – American National Standard Institute Test Method for Thermal Transmittance and Air Infiltration of Garage Doors
- E. ASTM A 123 – Standard Specification for Zinc (hot-dipped galvanized) coatings on iron and steel products.
- F. ASTM A 229 - Steel wire, oil-tempered for mechanical springs.
- G. ASTM E 330 - Structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
- H. ASTM E 413 - Classification for Rating Sound Insulation
- I. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.

- J. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- K. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- L. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.
- M. ANSI/DASMA 108 - Standard Method for Testing Sectional Garage Doors, Rolling Doors and Flexible Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference
- N. ANSI/DASMA 102 - Specifications for Sectional Overhead-Type Doors
- O. ANSI/DASMA 115 - Standard Method for Testing Sectional Doors, Rolling Doors, and Flexible Doors: Determination of Structural Performance Under Missile Impact and Cyclic Wind Pressure
- P. FDA 21 CFR 177.1520 - Olefin polymers

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Performance Standards: Provide test data validating the following:
 - 1. Door Section: Gloss retention, fade resistance, FDA compliance, cold crack performance, load to rebound, dent resistance impact.
 - 2. Drive Train: Spring cycle life, track, hinges, rollers, cable assembly, cable strength.
 - 3. Door Assembly: Thermal performance, deflection, wind load.
- D. Shop Drawings:
 - 1. Provide drawings indicating track details, head and jamb conditions, spring shafts, anchorage, accessories, finish colors, patterns and textures, operator mounts and other related information.
 - 2. Regulatory Requirements and Approvals: Provide shop drawings in compliance with local Authority having Jurisdiction (AHJ).
- E. Certifications:
 - 1. Submit manufacturer's certificate that products meet or exceed specified requirements.
 - 2. Submit installer qualifications.
- F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an authorized installer of door manufacturer who has demonstrated experience on projects of similar size and complexity.
- B. Manufacturer Qualifications: Company with a minimum of five-year experience in producing the specified type of doors.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

- A. Provide manufacturer's standard warranty against defects in material and workmanship, as further described with each model in Part 2 of this Section.
- B. Warrant electrical operator and component parts for two (2) years against defects in material and workmanship.
- C. Warrant electrical operator and component parts against defects in material and workmanship for three (3) years, on the operator.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Raynor, which is located at: 1101 East River Rd. P. O. Box 448; Dixon, IL 61021-0448; Toll Free Tel: 800-4-RAYNOR; Tel: 815-288-1431; Fax: 888-598-4790; Email: architectsupport@raynor.com; Web: www.raynor.com
- B. Substitutions: Per Instructions to Bidders and Section 01600.

2.2 SECTIONAL THERMAL SANDWICH DOOR

- A. **ThermaSeal TM175 as manufactured by Raynor Garage Doors:**
 - 1. Doors:
 - a. Operation:
 - 1) Provide doors designed for electric motor operation.
 - b. Jamb Construction: See Drawings
 - 1) Steel jambs with self-tapping fasteners.
 - 2) Masonry jambs with anchor bolt fasteners.
 - c. Structural Performance Requirements:
 - 1) Wind Loads: 13.3 psf design load/ 20 psf test load standard
 - 2) Wind Loads: Uniform pressure of: _____ psf.
 - d. International Energy Conservation Code (IECC) Requirements:
 - 1) Air Infiltration – Maximum air leakage of 0.4 cfm/ft2 is required. Testing shall be in accordance with DASMA 105 test procedure.

- 2) ThermaSeal TM175 provides an air leakage rating of 0.22 cfm/ft² with optional IECC Compliance Package.
 - 3) ThermaSeal TM175 provides an installed U-factor of 0.21.
2. Sections:
- a. **ThermaSeal TM175:**
 - 1) Sections shall be pressure bonded to injected polyurethane foam insulated core. Hinge reinforcement strips shall be 20 gauge galvanized steel, located within section interior. End stiles to be 16 gauge galvanized steel.
 - 2) Material: Steel sandwich construction, 1-3/4 inches (44 mm) thick, roll formed from commercial quality, hot-dipped galvanized (G40 exterior) steel complying with ASTM A 653. Exterior skin shall be constructed of 25 gauge steel and interior skin shall be 26 gauge steel with embossed stucco texture.
 - 3) Finish: Exterior skin to have two coats of paint, one primer coat and one finish coat.
 - a) ColorWave Enamel paint finish, color as selected by Architect from Raynor's ColorWave post paint process featuring 1500 colors of Sherwin Williams Polane Enamel paint.
 - 4) Insulation: Expanded polyurethane with R-value of 16.4.
 - b. Seals: Interior and exterior skins to be separated by a molded thermal break and weather seal along section joint. Bottom of door to have flexible U-shaped vinyl seal retained in aluminum rail. Optional dual-durometer vinyl blade seal on top section to prevent airflow above header/
 - c. Trussing: Doors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.
 - d. Full-view window consisting of aluminum stile and rail construction and color matched to door exterior with powdercoat paint. Full View to be provided as follows.
 - a) **1/2 inch insulated glazing options**
 - 1) 1/2 inch (12.69 mm) **Insulated Solarban 60 Low E Tempered Glass** (tinted Gray or Bronze as selected by Architect) consisting of two panes of 1/8 inch (3.2 mm) Tempered insulated glass.
2. Track:
- a. Material: Hot-dipped galvanized steel (ASTM A 653), fully adjustable for adequate sealing of door to jamb or weatherseal.
 - b. Configuration Type: Normal Headroom.
 - c. Configuration Type: Low Headroom.
 - d. Configuration Type: Vertical Lift.
 - e. Configuration Type: Lift-Clearance.
 - f. Configuration Type: Incline.
 - g. Configuration Type: Contour.
 - h. Track Size: 3 inches (76 mm).
 - 1) Jamb Type: Steel, wood, or masonry.
 - a) Mounting: Floor-to-header angles. 13 gauge (2.2 mm) minimum continuous angles from floor to door header. Angle Size: 3-1/2 x 5 inches (89 x 127 mm) on 3-inch track.
 - b) Mounting: Floor-to-shaft angles. 13 gauge (2.2 mm) minimum continuous angles from floor, past header, up to door shaft. Angle Size: 3-1/2 x 5 inches (89 x 127 mm) on 3-inch track.

- c) Mounting: QuikClip. Clip-Angle brackets pre-assembled to 13 gauge (2.2 mm) minimum continuous angle from floor to door header and continuous angle from door header to door shaft. Angle Size: 3-1/2 x 1-1/4 inches (89 x 32 mm) on 3-inch track.
 - i. Finish:
 - 1) ArmorBrite Powdercoat Finish: Color as selected by Architect
- 3. Counterbalance:
 - a. Counterbalance System: Provided with aircraft-type, galvanized steel lifting cables with minimum safety factor of 5. Torsion Springs consisting of heavy-duty oil-tempered wire torsion springs on a continuous ball-bearing cross-header shaft.
 - 1) Spring Cycle Requirements: Standard 10,000 cycles.
- 4. Hardware:
 - a. Hinges and Brackets: Fabricated from galvanized steel.
 - b. Track Rollers: 3 inches (76.2 mm) diameter consistent with track size, with hardened steel ball bearings.
 - c. Perimeter Seal: Provide complete weather stripping system to reduce air infiltration. Weather stripping shall be replaceable.
 - 1) For bracket mounted doors provide climate seal or vinyl seal with aluminum retainer.
 - 2) For angle mounted doors provide angle clip-on seal.
 - d. Furnish door system with locks: Exterior lock with five-pin tumbler cylinder, night latch and steel bar engaging track.
 - e. Furnish door system with locks: Interior lock with dead bolt provided with hole to receive padlock provided by Owner.
- 5. ThermaSeal Limited Warranty: Warrants the door sections against defects in material and workmanship, and deterioration due to rust-through for ten years from date of delivery to the original purchaser. Warrant the door sections against delamination of the insulation from the steel skins for ten years from date of delivery to the original purchaser. Window components shall be warranted against defects in material and workmanship for one year from date of Substantial Completion. Warrant all hardware and spring components against defects in material and workmanship for one year (or cycle life of the springs) from date of Substantial Completion.

2.3 ELECTRIC OPERATORS

- A. ControlHoist as manufactured by Raynor Garage Doors:
 - 1. Model:
 - a. Raynor ControlHoist Optima:
 - 1) Motor Horsepower Rating: Continuous 2 HP.
 - 2) Electrical Requirements: 115 volt single phase.
 - 3) Electrical Requirements: 230 volt single phase.
 - 4) Electrical Requirements: 208-230 volt three phase.
 - 5) Electrical Requirements: 460 volt three phase.
 - 6) Duty Cycle: 30 cycles/hour or 300 cycles/day.
 - 7) Control Wiring: Solid state circuitry with provisions for connection of safety edge to reverse, external radio control hook-up and maximum run timer. Provisions for timers to close, monitored reversing devices, mid stop and lock bar sensor capability.
 - a) Provide three button momentary contact "open-stop", constant pressure on close (can be changed to momentary to close).
 - b) Custom wiring.
 - 8) Entrapment protection:

- a) Wired Monitored electric reversing edge extending full width of door.
- b) Wireless Monitored electric reversing edge extending full width of door.
- c) NEMA 1 Monitored photo electric eyes mounted on jambs.
- d) NEMA 4X Monitored photo electric eyes mounted on jambs.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared. Verify that site conditions are acceptable for installation of doors, operators, controls and accessories. Ensure that openings are square, flush and plumb.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. General: Install door, track and operating equipment complete with all necessary accessories and hardware according to shop drawings, manufacturer's instructions.
- B. Lubricate bearings and sliding parts, and adjust doors for proper operation, balance, clearance and similar requirements.

3.4 PROTECTION

- A. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and legally dispose of construction debris from project site.
- B. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation.
- C. Lubricate bearings and sliding parts, assure weather tight fit around door perimeter and adjust doors for proper operation, balance, clearance and similar requirements. Protect installed products until completion of project.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

3.5 DOOR SCHEDULE

- A. Doors 130 C and 130D**
- B. Door 201 B**

END OF SECTION

Section 08363
FOUR-FOLD DOOR SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes Four-Fold metal doors with surface mounted tube frames.
- B. Operation of Four-Fold metal doors includes overhead mounted electro-mechanical operators.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified consisting of manufacturer's technical Product Data and installation instructions for each type of door required, including data substantiating that products comply with requirements.
- C. Submittal Drawings showing fabrication and installation of Four-Fold metal doors including plans, elevations, sections, details of components, hardware, operating mechanism, and attachments to the other units of Work. Include wiring diagrams for coordination with electrical trade.
- D. Reference list including (5) successful installations of this type of door within the past two (2) years.

1.4 QUALITY ASSURANCE

- A. Doors shall be designed to withstand external or internal horizontal wind loads of **120mph (3 second gust) per ASCE 7-16**. The maximum allowable deflection shall not exceed 1/120 of the span. Fiber stresses in main members shall be limited to 27,000 pounds per square inch. Steel frames shall be designed in accordance with the AISC "Steel Construction Manual".
- B. Door manufacturer shall have at least 10 years experience in manufacturing door type specified.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water, and so as to permit access for inspection and handling.
- B. Handle materials carefully to prevent damage.

1.6 WARRANTY

- A. The door manufacturer shall provide a written standard limited warranty for material and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. For the purpose of establishing design, quality and type, products manufactured by Door Engineering and Manufacturing, 101 Power Dr, Mankato, MN 56001, (800)-959-1352 have been specified. **Model FF300 Series: Glazed.**
- B. Substitutions: Per Instructions to Bidders and Section 01600.

2.2 MATERIALS

- A. Steel Tube: ASTM A513 and ASTM A500/A500M
- B. Steel Sheets: Steel sheets of commercial quality, complying with ASTM A1008 cold-rolled steel sheet.
- C. Hardware: Manufacturer's standard components.
- D. Fasteners: Zinc-coated steel.

2.3 FOUR-FOLD DOORS

- A. Construction: Door framing shall be minimum 11-gauge structural steel tube with 16-gauge steel sheet on the exterior and interior faces. Sheeting shall be formed on the vertical edges with no visible welds on the interior or exterior panel faces. All frames and framing members shall be true to dimension and square in all directions, and no door shall be bowed, warped, or out of line, in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Exposed welds and welds which interfere with the installation of various parts shall be ground smooth and flush.
- B. Surface Mounted Tube Frame: Supply pre-hung tube frame system constructed of minimum TS6x4x3/16", designed to anchor to masonry wall construction or weld to steel structure. All hinges, track supports and operator supports shall be factory attached.
- C. Factory finish: Door Panels and Tube Frames shall be finished with manufacturer's standard PPG Spectracron epoxy primer and polyurethane top coat. Customer to select from Manufacturer's standard color chart or furnish sample to match.
 - 1. Operator and operating hardware shall be powder-coated manufacturer's standard gray.
- D. Hardware: Hardware shall include guide tracks and brackets, trolleys, center guides, not less than three pairs of jamb and fold hinges per opening, and all bolts, nuts, fasteners, etc. necessary for complete installation and operation.
 - 1. All hardware, including hinges and trolleys, shall be bolted to the panel for easy removal for service or panel replacement.

2. Doors up to 16' wide and under 30psf windload shall require no floor mounted supports, guides or tracks.
 3. Top tracks shall be adjustable on the end track hangers to allow for adjustment of the door panels in the open position and easily replaceable without removal of the door framing or operators.
- E. Hinges: Jamb hinges shall be dual shear and have two thrust bearings and two needle bearings. Fold hinges shall be stainless steel and be dual shear with two thrust bearings. All bearings shall be completely concealed within the hinge barrel and include grease zerks. All hinge pins shall be minimum $\frac{3}{4}$ " diameter hardened steel.
- F. Hinge Guards: Provide plastic guards at jamb hinges to prevent access through hinge space.
- G. Weatherstripping: Material shall be adjustable and readily replaceable and provide a substantially weather-tight installation. Weatherstripping at center shall be 1/16" EPDM and include no exposed fasteners on the exterior side of the panel. Weatherstripping at sill shall include two 1/16" EPDM sweeps with an aluminum retainer. The retainer shall be attached to the door with adhesive.
- H. Perimeter Weatherstripping: Provide full perimeter jamb and head weatherstripping.
- I. Vision Panels: Provide 1" insulated, tempered, vision panels of the size, shape and location as noted on the drawings.

2.4 OPERATOR

- A. Each Four-Fold door shall be operated by an overhead mounted electro-mechanical drive unit designed for high cycle operation. Operator consists of an electric motor, gear reducer, and rotating drive arm. The door shall be operated with connecting rods attached to the rotating drive arm on the operator and to control arms attached to the jamb door section and to the door lintel. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be equipped with oil impregnated bronze bearings on polished shafts.
- B. Operator shall be instantly reversible, open and close rapidly and start and stop gradually. Operator shall be adjustable to allow door to fully clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disengaging mechanism to convert to manual operation.
- C. Electric motor shall be of sufficient size to operate doors under normal operating conditions at no more than 75 percent of rated capacity. The motor shall be wound for three phase 208/230/480 VAC, 60 Hertz operation.
- D. Electric Controls: Controls shall be furnished by the door manufacturer and shall be complete for each door, and built in accordance with the latest NEMA standards. **Incoming electrical shall be (Choose One): 120VAC single phase, 208VAC single phase, 208/230VAC 3-phase, 480VAC 3-phase.**
1. Control panel assemblies shall be UL listed as per NFPA70.
 2. Controls shall include a programmable logic controller with digital message display. Controller shall include programmable close timers and programmable inputs/outputs.

3. Controls shall include a variable frequency drive with independent adjustment of the opening and closing speeds.
4. Enclosures shall be NEMA 4 with disconnect switch.
5. Pushbuttons (interior) for each door shall have one (1) momentary pressure three-button push-button station marked "OPEN", "CLOSE" and "STOP". Push button enclosure shall be NEMA 4.
6. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed position.
7. Safety edges: Provide monitored electric safety edges on leading edge of all doors to reverse door upon contact with obstruction.
8. Photo eyes: Provide (1) exterior, jamb mounted, light Curtain type photo eyes, NEMA 4 rated. Photo eye shall cover from floor level to 72" above floor.
9. Presence Sensor: Provide (1) interior, overhead mounted, presence sensor BEA IS40P or equal. Doors over 16' tall shall include LZR-Widescan or equal.
10. Radio controls: Provide three (3) radio receivers and (3) single button remotes per door. Remotes to open and close doors with single button.
11. **(Provide the following Option) Timer Activation Loop Detectors (fire station applications):** Provide "pulse on exit type" loop detector to activate auto close timer once loop has been activated and cleared, include hand/auto switch to deactivate timer. G.C. to coordinate installation of preformed loop with installer prior to exterior apron being poured.
12. **(Provide the following Option) Warning Horn/Strobe:** Provide warning light and strobe. Include outputs PLC to allow for activation while door is in motion both opening and closing, along with activation prior to closing. Include programmable "delay-to-close" timer which activates the warning horn for a set time, prior to the door closing.
13. Wiring: Door manufacturer shall supply controls and components only. Electrical contractor shall install controls and furnish and install conduits and wiring for jobsite power and control wiring.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install Four-Fold metal doors in strict accordance with the approved drawings by qualified door erection crews. All door openings shall be completely prepared by the general contractor prior to the installation of the doors. Permanent or temporary electric wiring shall be brought to the door opening before installation is started and shall be completed so as not to delay the inspection test.
- B. Doors shall be set plumb, level, and square, and with all parts properly fastened and mounted. All moving parts shall be tested and adjusted and left in good operating condition.

3.2 ADJUSTING AND CLEANING

- A. Inspection of the doors and a complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.
- B. Clean surfaces and repaint abraded or damaged finished surfaces to match factory-applied finish.

3.3 DOOR SCHEDULE

A. Doors 130 A and 130B.

END OF SECTION

SECTION 08410
ALUMINUM ENTRANCES , STOREFRONTS & ALUMINUM WINDOWS
PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Aluminum frames, doors, glazed lights, and windows.
- B. Glass and infill panels.
- C. Anchors, brackets, and attachments.
- D. Perimeter sealant

1.02 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

- A. Section 08712 - Hardware: Door hardware items other than specified in this Section.

1.03 PERFORMANCE - ALUMINUM & STOREFRONTS

- A. System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 F degrees without causing detrimental effects to system or components.
- B. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with standard building design pressure of 30 lb/sq. ft. as measured in accordance with ANSI/ASTM E330.
- C. Limit mullion deflection to 1/200, or flexure limit of glass with full recovery of glazing materials, whichever is less.
- D. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior.
- E. Limit air infiltration through assembly to 0.06 cu. ft/min/sq ft of assembly surface area, measured at a reference differential pressure across assembly of 0.3 inches water gage as measured in accordance with ANSI/ASTM E283.
- F. System to accommodate, without damage to system or components, or deterioration of perimeter seal: Movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.

1.04 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01300.
- B. Include system and component dimensions; components within assembly; framed opening requirements and tolerances; anchorage and fasteners; glass and infills; door hardware requirements; and affected related work.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.
- D. Submit samples under provisions of Section 01300.
- E. Submit two samples, illustrating prefinished aluminum surface, glass setting materials, glass setting

blocks, spacers and sealants.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Provide wrapping and strippable coating to protect prefinished aluminum surfaces.

1.06 WARRANTY

- A. Provide three year manufacturer's warranty under provisions of Section 01700.
- B. Warranty: Cover complete system for failure to meet specified requirements.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - ALUMINUM ENTRANCES AND STOREFRONTS

- A. Kawneer Frame style -
 - Exterior: Trifab II 45I .
 - Interior: Trifab II 450-w/4-1/2" x 1-3/4" profile.

Exterior Doors shall be Medium Stile Design (Unless noted otherwise) with 10" ADA complying bottom rails.

Interior Doors shall be Narrow Stile Design (Unless noted otherwise) with 10" ADA complying bottom rails.

- B. Equal products by Oldcastle, Tubelite, Vistawall and Efco are approved for bidding.
- C. Substitutions: As provided by Instructions to Bidders and Section 01600.

2.02 MATERIALS - ALUMINUM ENTRANCES & STOREFRONTS

- A. Aluminum extrusions shall be 6063-T5 alloy and temper. Exposed sheets to receive an anodic finish shall be 5005 alloy to match extrusions. Sheet which is not exposed may be 3003 alloy with mill finish. All sections shall be formed true to detail and free from defects impairing appearance, strength or durability.
- B. Sheet Steel: ANSI/ASTM A446.
- C. Steel Sections: ANSI/ASTM A36: shapes to suit mullion sections.
- D. Fasteners: Aluminum, non-magnetic stainless steel, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum components.

Do not use exposed fasteners except where unavoidable for application of hardware. Match finish of adjoining metal.

- E. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible; otherwise, non-magnetic stainless steel or hot-dip galvanized steel complying with 2 ASTM A386.
- F. Concrete/Masonry Inserts: Cast iron, malleable iron, or hot-dip galvanized steel complying with ASTM A386.
- G. Bituminous Coatings: Cold-applied asphalt mastic complying with SSPC-PS 12, compounded for 30-mil thickness per coat.

- H. Clear Protective Coatings: AAMA 602.2, compounded specifically for protection of aluminum finish during construction.

2.03 FABRICATED COMPONENTS - ALUMINUM ENTRANCES AND STOREFRONTS

- A. Frames: flush applied glazing stops. (**Profile:** as specified above.)
- B. Systems shall accommodate glass of thickness indicated. Refer to detailed Drawings and Schedules and to Glass and Glazing Section 08800 for type and grade of glass to be used.
- C. Structural aluminum members shall be designed to support a wind load required by governing building code on the wall surface.
- D. Internal drainage shall lead any infiltrated water to the exterior through weep slots in the extruded aluminum sill.
- E. System shall provide for expansion and contraction of the component materials as will be required by an ambient temperature range of 120 degrees F without causing harmful buckling or cracking, opening of joints, undue stress on fasteners, or other effects detrimental to weathering performance.

2.04 HARDWARE - ALUMINUM ENTRANCES AND STOREFRONTS

- A. Hardware: The following items shall be furnished by the Entrance Manufacturer:
 - 1. All doors:
 - a. Top, bottom and intermediate offset pivots.
 - b. Closer : Surface mounted overhead mounted with parallel arm, cover, and installed per ANSI A156.4, Grade 1. Closer to fully comply with all handicapped requirements including ADA. Include the following features:
 - 1) Hold-open arm.
 - 2) Delayed-action closing.
 - c. Threshold - 1/2 inch x 4 inch aluminum mill finish. (1/2" maximum height per Building Code- Exterior doors only).
 - d. Push/Pull "V" style.
 - e. Panic Device - Concealed-rod type panic exit devices actuated by full-width crash bar; comply with UL 305. (**Exterior Doors Only.**)
 - f. Weatherstripping - Automatic door bottom and pile type.
 - g. Mortise or Rim Cylinder provided by Section 08712 as required by particular Aluminum Entrance Manufacturer. This Section shall coordinate with Section 08712 accordingly.

2.05 SEALANTS

- A. All splice covers shall be set in non-drying mastic. Joint sleeves shall be sealed to adjacent members with skinning type elastic sealant. Aluminum heads, sills and jambs shall be sealed to surrounds with a skinning type sealant on inside and outside perimeter joints to block through metal conduction.
- B. Materials:
 - 1. Covers and Joint Sleeves: As recommended by Aluminum Frame Manufacturer.
 - 2. Perimeter Caulking: Complying with materials and installation requirements specified in Section 07951 - Caulking and Sealing.

2.06 FINISHES

- A. Finish for all aluminum specified in this Section shall be Class I Clear Coating conforming to Aluminum Association Standard AA-M12 C22 A42/44. **Color to be Dark Bronze or Clear Anodized AA-M12 C22 A31, #17 Clear as selected by Architect.**
- B. Steel shall conform to ASTM A36-74. All steel shall receive one coat of zinc chromate primer after fabrication. Field welds and scratches shall receive one touch-up coat after installation.

2.06 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08800.

2.07 FABRICATION

- A. Fabricate doors and frames allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.
- B. Rigidly fit and secure joints and corners with screw and spline and internal reinforcement. Make joints and connections flush, hairline, and weatherproof.
- C. Develop drainage holes with moisture pattern to exterior.
- D. Prepare components to receive anchor devices. Fabricate anchorage items.
- E. Arrange fasteners, attachments, and jointing to ensure concealment from view.
- F. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.
- B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install frames, glazing and hardware in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely attach frame assembly to structure.
- C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- D. Coordinate attachment and seal of air and vapor barrier materials. Install sill flashings.

- E. Install hardware using templates provided. Refer to Section 08712 for installation requirements.
- F. Install glass and infill panels in accordance with Section 08800.
- G. Install perimeter type sealant, backing materials, and installation requirements in accordance with Section 07951.

3.03 TOLERANCES

- A. Variation from Plane: 0.03 inches per foot maximum or 0.25 inches per 30 feet, whichever is less.
- B. Misalignment of Two Adjoining Members Abutting in Plane: 0.015 inches.

3.04 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08710 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware.
 - 3. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Hollow Metal Doors and Frames".
 - 2. Division 08 Section "Flush Wood Doors".
 - 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
- 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. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
 - 3. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
 - 4. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure difference.
 - 5. ASTM E1996 - Standard specification for performance of exterior windows, curtain walls, doors and storm shutters impacted by Windborne Debris in Hurricanes.
 - 6. FEMA P-361 2015/2021 - Design and Construction Guidance for Community Safe Rooms.
 - 7. ICC 500-2014/2020, ICC/NSSA Standard for the Design and Construction of Storm Shelters.

8. ICC/IBC - International Building Code.
9. NFPA 70 - National Electrical Code.
10. NFPA 80 - Fire Doors and Windows.
11. NFPA 101 - Life Safety Code.
12. NFPA 105 - Installation of Smoke Door Assemblies.
13. TAS-201-94 - Impact Test Procedures.
14. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
15. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
16. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 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.
 - h. Warranty information for each product.
 - 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. Shop Drawings: Details of electrified access control hardware indicating the following:
- 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.
 - 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
- 1. 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.

1.4 CLOSEOUT SUBMITTALS

- A. 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 Procedures.
- B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

1.5 QUALITY ASSURANCE

- A. Hardware Supplier and Hardware Installer must obtain a license with the Louisiana Office of State Fire Marshall in accordance to RS 40:1464 and RS 40:1664.
- B. 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.
- C. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- D. Installer Qualifications: A minimum 3 years 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.
- E. 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 by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.
- F. 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.
- G. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- I. 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, 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 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
- J. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 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".

1.7 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 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.

1.8 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. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

2.2 BUTT HINGES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - 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 or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. 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:
 - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.
 5. Manufacturers:
 - a. Hager Companies (HA) - BB Series, 5-knuckle.
 - b. McKinney (MK) - TA/T4A Series, 5-knuckle.
- B. Hinges at Storm Shelter 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.
1. Quantity: Provide the following hinge quantity:
 - a. Three Hinges: For shutters with heights 36 to 60 inches, and doors at height of 80 inches.
 - b. Four Hinges: For shutters with heights > 60 inches to 80 inches, and doors with heights greater than 84 inches.
 2. Quantity: Provide the following hinge quantity:
 - a. Three Hinges: For shutters with heights 36 to 60 inches, and doors at height of 80 inches.
 - b. Four Hinges: For shutters with heights > 60 inches to 80 inches, and doors with heights greater than 84 inches.
 - c. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - d. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - e. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. 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.
 4. Hinge Weight and Base Material: At a minimum, provide heavy weight hinges with stainless steel screws used in accordance with and specified as part of a certified Storm Shelter Opening meeting ICC 500.
 5. Manufacturers:

- a. McKinney (MK) - SP3386/SP3786.
- b. No Substitution.

2.3 CONTINUOUS HINGES

- A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-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:.

- a. Hager Companies (HA).
- b. Pemko (PE).

2.4 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Continuous Geared Transfer Hinges: Provide electrified transfer continuous geared hinges with a removable service panel cutout accessible without de-mounting door from the frame. Furnish with Molex™ standardized plug connectors with 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:

- a. Pemko (PE) - SER-QC (# wires) Option.

- B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

- a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
- b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

- a. Hager Companies (HA) - Quick Connect.
- b. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.
 - 1. Flush bolts to be furnished with 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 minimum 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:
 - a. Burns Manufacturing (BU).
 - b. Rockwood (RO).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units 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 face of 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 face of door and offset of 90 degrees unless otherwise indicated.
 - 4. Pulls shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
 - 5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
 - 6. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood (RO).

2.6 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. 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: Manufacturer's Standard.
- C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.
- D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents. Cylinders are to be factory keyed with owner having the ability for on-site original key cutting.
1. Patented key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
 2. Manufacturers:
 - a. Corbin Russwin (RU) - Access 3 AP.
 - b. Sargent (SA) - Degree DG1.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 3. New System: Key locks to a new key system as directed by the Owner.
- F. Key Quantity: Provide the following minimum number of keys:
1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
 3. Construction Keys (where required): Ten (10).
 4. Construction Control Keys (where required): Two (2).
 5. Permanent Control Keys (where required): Two (2).
- G. Construction Keying: Provide temporary keyed construction cores.
- H. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.7 KEY CONTROL

- A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

- a. Lund Equipment (LU).
- b. MMF Industries (MM).
- c. Telkee (TK).

2.8 MORTISE LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

- a. Corbin Russwin Hardware (RU) - ML2000 Series.
- b. Sargent Manufacturing (SA) - 8200 Series.

2.9 MULTI-POINT LOCKS AND LATCHING DEVICES

- A. Multi-Point Locksets, Storm Shelter: Provide ANSI/BHMA A156.37, Series 1000, Operational Grade 1 and Security Grade 1 Certified Products Directory (CPD) listed multi-point locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide locksets with functions and features as follows:

- a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
- b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
- c. Meets Florida Building Code FL2998 and UL Certification Directory ZHEM.R21744 for latching hardware for hurricane requirements.
- d. Approved for usage as part of a complete ICC 500 (2014/2020) and FEMA P-361 (2015/2021) door, frame, and hardware assemblies for storm shelter components.
- e. Lever torque to retract all bolts less than 28 in.lb.
- f. Cycle tested to 1,000,000 cycles.
- g. Seven-year limited warranty for mechanical functions.

2. Manufacturers:

- a. Corbin Russwin Hardware (RU) - FE6600 Series.

- b. Sargent Manufacturing (SA) - FM7300 Series.

2.10 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.
 - 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- 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 A156.36.
 - 4. Dustproof Strikes: BHMA A156.16.

2.11 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 - 1. Exit devices shall have a five-year warranty.
 - 2. 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.
 - 3. 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.
 - 4. 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.
 - 5. 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.
 - 6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with 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.

- b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 - 7. 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 dust proof strikes where thermal pins are required to project into the floor.
 - 8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 - 9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 - 10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 - 11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
 - 12. Hurricane and Storm Shelter Compliance: Devices to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or storm shelter products that have been independently third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.
- 1. Provide exit devices with functions and features as follows:
 - a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
 - b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
 - c. Meets UL Certification Directory ZHLL.R21744 for products used in windstorm rated assemblies.
 - d. Five-year limited warranty for mechanical features.
 - 2. Electromechanical exit devices shall have the following functions and features:
 - a. Universal Molex plug-in connectors that have standardized color-coded wiring and are field configurable in fail safe or fail secure and operate from 12vdc to 24vdc regulated.
 - b. EcoFlex or equivalent technology that reduces energy consumption up to 92% as certified by GreenCircle.
 - c. Options to be available for request-to-exit or enter signaling, latchbolt and touchbar monitoring.
 - d. Field configurable electrified trim to fail-safe or fail-secure that operates from 12-24VDC.
 - e. Five-year limited warranty for electromechanical features.
 - 3. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.

2.12 SURFACE DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers 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 manufacturer's written recommendations for sizing of door closers depending on size of 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 exterior or corridor side of doors; where possible install closers on door 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 and security type fasteners as specified in the hardware sets.
 7. Storm Shelter Compliance: Door closers to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate storm shelter products that have been independently third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.
- B. 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. Large body cast iron surface mounted door closers shall have a 30-year warranty.
 2. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC8000 Series.
 - b. Sargent Manufacturing (SA) - 281 Series.
- C. Door Closers, Surface Mounted (Heavy Duty): 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 or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard..

1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC6000 Series.
 - b. Sargent Manufacturing (SA) - 351 Series.

2.13 ARCHITECTURAL TRIM

A. 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 stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on 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 protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, .050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood (RO).

2.14 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 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. Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood (RO).

- C. 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:

- a. Norton Rixson (RF).
- b. Rockwood (RO).
- c. Sargent Manufacturing (SA).

2.15 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 NFPA 252, Standard Methods of 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.

- 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. Hurricane and Storm Shelter Compliance: Devices to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or storm shelter products that have been independently third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

- G. Manufacturers:

- 1. National Guard Products (NG).
- 2. Pemko (PE).

2.16 ELECTRONIC ACCESSORIES

- A. 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 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:
 - a. Security Door Controls (SD) - DPS Series.
 - b. Securitron (SU) - DPS Series.
- B. Switching Power Supplies: Provide the least number of power supplies at the appropriate amperage level sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 1. Power supplies shall meet all functions and features as specified herein.
 - a. UL listed dual voltage 12 or 24 VDC field selectable continuous output.
 - b. Tolerates brownout or overvoltage input $\pm 15\%$ of nominal voltage.
 - c. Thermal shutdown protection with auto restart.
 - d. Circuit breaker protection against overcurrent and reverse battery faults.
 - e. Integrated battery charging circuit to prevent overvoltage on locking devices.
 - f. Available with a single relay fire trigger or individually triggered relayed outputs.
 - g. Monitoring options as specified.
 - 2. Manufacturers:
 - a. Altronix (AS) - Maximal 3.
 - b. Securitron (SU) - AQD Series.

2.17 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.

2.18 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

3.1 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.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 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. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 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. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- F. 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.

3.4 FIELD QUALITY CONTROL

- A. 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.

3.5 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.

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

3.7 DEMONSTRATION

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

3.8 DOOR HARDWARE SETS

- 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.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing 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.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

- B. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. RU - Corbin Russwin
5. RF - Rixson
6. OT - Other
7. SU - Securitron

Hardware Sets based on plans dated 07/11/2025

Set: 1.0

Doors: 101A

Description: Ext Sgl Alum

| | | | |
|-----------------------|--------------------------|-----|----|
| 1 Cylinder | Type as required - ACP | 630 | RU |
| 1 Balance of hardware | By the door manufacturer | | OT |

Notes: Confirm Cylinder type required. Windstorm required.

CITY OF NATCHITOCHEs NEW FIRE STATION NO. 3
NATCHITOCHEs, LA

Set: 2.0

Doors: 115

Description: Ext Pr Alum

| | | | |
|-----------------------|--------------------------|-----|----|
| 1 Cylinder | Type as required - ACP | 630 | RU |
| 1 Balance of hardware | By the door manufacturer | | OT |

Notes: Confirm Cylinder type required. Windstorm required.

Set: 3.0

Doors: 116B, 122

Description: Ext - Sgl - Rim/NL x Pull - Closer/stop - Access Control

| | | | |
|---------------------------------|--------------------------------------|-------|----|
| 1 Continuous Hinge | CFM__HD1 SER* | PE | ⚡ |
| 1 Rim Exit Device, Nightlatch | ED5200S K157ET M107 M92 MELR M54 ACP | 630 | |
| RU | ⚡ | | |
| 1 Door Pull | BF157 | US32D | RO |
| 1 Surface Closer w/ spring stop | DC6210 A11 | 690 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Gasketing | 303AS | | PE |
| 1 Rain Guard | 346C | | PE |
| 1 Sweep | 315CN | | PE |
| 1 Threshold | 2005AV | | PE |
| 1 ElectroLynx Harness | QC-C***P (Length as req's) | MK | ⚡ |
| 1 Frame Wire Harness | QC-C1500P | MK | ⚡ |
| 1 Position Switch | DPS-M/W-BK (as req'd per app) | SU | ⚡ |
| 1 Power Supply | AQD Series | SU | ⚡ |
| 1 Card Reader / Keypad | By Security Contractor. | OT | |

Notes: Doors are normally closed and secure. Presentation of valid credential will allow entry by pull. Upon loss of power, doors will remain secure. Free egress at all times.

Hardware meets Windstorm design intent as tested in an assembly. Confirm hardware meets Windstorm assembly requirements per door manufacturer.

Set: 4.0

Doors: 130E, 137

Description: Ext - Sgl - Rim/NL x Lever - Closer/stop

| | | | |
|---------------------------------|-----------------------------|-------|----|
| 1 Continuous Hinge | CFM__HD1 | | PE |
| 1 Rim Exit Device, Nightlatch | ED5200S N957ET M107 M54 ACP | 630 | RU |
| 1 Surface Closer w/ spring stop | DC6210 A11 | 690 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Gasketing | 303AS | | PE |
| 1 Rain Guard | 346C | | PE |
| 1 Sweep | 315CN | | PE |
| 1 Threshold | 2005AV | | PE |

CITY OF NATCHITOCHES NEW FIRE STATION NO. 3
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1 Position Switch DPS-M/W-BK (as req'd per app) SU ⚡

Notes: Hardware meets Windstorm design intent as tested in an assembly. Confirm hardware meets Windstorm assembly requirements per door manufacturer.

Set: 5.0

Doors: 138, 201A

Description: Ext - Sgl - Storeroom - Closer/stop - KP

| | | | |
|---------------------------------|-------------------------------|-------|----|
| 1 Continuous Hinge | CFM__HD1 | | PE |
| 1 Storeroom Lock | ML2049 NSM ACP | 630 | RU |
| 1 Surface Closer w/ spring stop | DC6210 A11 | 690 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Gasketing | 303AS | | PE |
| 1 Rain Guard | 346C | | PE |
| 1 Sweep | 315CN | | PE |
| 1 Threshold | 2005AV | | PE |
| 1 Position Switch | DPS-M/W-BK (as req'd per app) | SU | ⚡ |

Notes: Hardware meets Windstorm design intent as tested in an assembly. Confirm hardware meets Windstorm assembly requirements per door manufacturer.

Set: 6.0

Doors: 101B

Description: Sgl -Rim/CR - Closer - Gasket - KP

| | | | |
|----------------------------------|------------------------|-------|----|
| 3 Hinge (heavy weight) | T4A3786 | US26D | MK |
| 1 Fire Rated Rim Exit, Classroom | ED5200A N955ET ACP | 630 | RU |
| 1 Surface Closer | DC6200 / 6210 M54 | 689 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 1 Gasketing | S88BL | | PE |

Set: 7.0

Doors: 110

Description: Sgl - Rated Rim/CR - Closer - Gasket - KP - Bay

| | | | |
|----------------------------------|--------------------|-------|----|
| 3 Hinge (heavy weight) | T4A3786 | US26D | MK |
| 1 Fire Rated Rim Exit, Classroom | ED5200A N955ET ACP | 630 | RU |
| 1 Surface Closer w/ spring stop | DC6210 A11 | 690 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Gasketing | S88BL | | PE |
| 1 Sweep | 315CN | | PE |
| 1 Threshold | 2005AV | | PE |

Set: 8.0

Doors: 102

CITY OF NATCHITOCHES NEW FIRE STATION NO. 3
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Description: Sgl - Classroom - Closer - Gasket - KP - Bay

| | | | |
|------------------------|------------------------|-------|----|
| 3 Hinge (heavy weight) | T4A3786 | US26D | MK |
| 1 Classroom Lock | ML2055 NSM ACP | 626 | RU |
| 1 Surface Closer | DC6200 / 6210 M54 | 689 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 1 Gasketing | S88BL | | PE |
| 1 Sweep | 315CN | | PE |
| 1 Threshold | 2005AV | | PE |

Set: 9.0

Doors: 132A

Description: Sgl - Classroom - Closer/stop - Gasket - KP - Bay

| | | | |
|---------------------------------|------------------|-------|----|
| 3 Hinge (heavy weight) | T4A3786 | US26D | MK |
| 1 Classroom Lock | ML2055 NSM ACP | 626 | RU |
| 1 Surface Closer w/ spring stop | DC6210 A11 | 690 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Gasketing | S88BL | | PE |
| 1 Sweep | 315CN | | PE |
| 1 Threshold | 2005AV | | PE |

Set: 10.0

Doors: 109

Description: Pair - Storeroom - MFB - OH Stop

| | | | |
|-----------------------|-------------------------|-------|----|
| 6 Hinge, Full Mortise | TA2714 | US26D | MK |
| 1 Flush Bolt | 555 / 557 12" / 72" AFF | US26D | RO |
| 1 Dust Proof Strike | 570 | US26D | RO |
| 1 Storeroom Lock | ML2057 NSM ACP | 626 | RU |
| 2 Surf Overhead Stop | 9-x36 | 630 | RF |
| 1 Astragal Set (2) | 303AS | | PE |
| 1 Gasketing | S88BL | | PE |

Set: 11.0

Doors: 114B, 133, 136

Description: Sgl - Storeroom -OH Stop

| | | | |
|-----------------------|----------------|-------|----|
| 3 Hinge, Full Mortise | TA2714 | US26D | MK |
| 1 Storeroom Lock | ML2057 NSM ACP | 626 | RU |
| 1 Surf Overhead Stop | 9-x36 | 630 | RF |
| 3 Silencer | 608-RKW | | RO |

Set: 12.0

Doors: 106, 121

Description: Sgl - Storeroom - Closer / Gasket

| | | | |
|-----------------------|--------|-------|----|
| 3 Hinge, Full Mortise | TA2714 | US26D | MK |
|-----------------------|--------|-------|----|

CITY OF NATCHITOCHES NEW FIRE STATION NO. 3
NATCHITOCHES, LA

| | | | |
|------------------|------------------------|-------|----|
| 1 Storeroom Lock | ML2057 NSM ACP | 626 | RU |
| 1 Surface Closer | DC6200 / 6210 M54 | 689 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 1 Gasketing | S88BL | | PE |

Set: 13.0

Doors: 105, 113A, 113B, 131

Description: Sgl - Office

| | | | |
|-----------------------|------------------------|-------|----|
| 3 Hinge, Full Mortise | TA2714 | US26D | MK |
| 1 Office Lock | ML2051 NSM ACP | 626 | RU |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 3 Silencer | 608-RKW | | RO |

Set: 14.0

Doors: 103, 112, 116A, 132B

Description: Sgl - Classroom - Closer - KP

| | | | |
|-----------------------|------------------------|-------|----|
| 3 Hinge, Full Mortise | TA2714 | US26D | MK |
| 1 Classroom Lock | ML2055 NSM ACP | 626 | RU |
| 1 Surface Closer | DC6200 / 6210 M54 | 689 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 3 Silencer | 608-RKW | | RO |

Set: 15.0

Doors: 108, 117, 118, 119, 120, 123, 124, 125, 126, 127, 128, 129, 135

Description: Sgl - Privacy - Closer

| | | | |
|-----------------------|------------------------|-------|----|
| 3 Hinge, Full Mortise | TA2714 | US26D | MK |
| 1 Privacy Lock | ML2030 NSVN V20 | 626 | RU |
| 1 Surface Closer | DC6200 / 6210 M54 | 689 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 1 Gasketing | S88BL | | PE |

Set: 16.0

Doors: 111

Description: Sgl - Push/Pull - Closer - KP

| | | | |
|------------------------|------------------------|-------|----|
| 3 Hinge (heavy weight) | T4A3786 | US26D | MK |
| 1 Push Plate | 70C-RKW | US32D | RO |
| 1 Pull Plate | 107x70C | US32D | RO |
| 1 Surface Closer | DC6200 / 6210 M54 | 689 | RU |
| 1 Kick Plate | K1050 8" BEV CSK | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 3 Silencer | 608-RKW | | RO |

CITY OF NATCHITOCHES NEW FIRE STATION NO. 3
NATCHITOCHES, LA

Set: 17.0

Doors: 130A, 130B, 130C, 130D, 201B

Description: OH Door

| | | | |
|-----------------------|--------------------------|-----|----|
| 1 Cylinder | Type as required - ACP | 630 | RU |
| 1 Balance of hardware | By the door manufacturer | | OT |

Notes: Verify cylinder type required.

Set: 18.0

Doors: 134

Description: Single interior with 3 point lock - FEMA StormPro

| | | | |
|--------------------|-------------------------------|-------|----|
| 4 Hinge, Hvy Wt | SP3786 5" x 4-1/2" | US26D | MK |
| 1 Multi-Point Lock | FE6665 NSM M188 ACP | 630 | RU |
| 1 Surface Closer | DC8210 A10 M54 | 689 | RU |
| 1 Kick Plate | K1050 WS 10" x 2" LDW CSK BEV | US32D | RO |
| 1 Door Stop | 406 / 441H as required | US32D | RO |
| 1 Gasketing | S773 (Head & Jambs) | | PE |

Notes: Door will come with 3/8" undercut. Hardware is specified for design intent and is tested with StormPro doors. Hardware meets design intent as tested in an assembly. Confirm hardware meets Windstorm assembly requirements per door manufacturer.

END OF SECTION 08710

SECTION 08800
GLASS AND GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Provide glazing and glazing accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 STANDARDS

- A. Meet requirements and recommendations of applicable portions of Standards listed:
1. American National Standards Institute. ANSI
 2. Consumer Products Safety Council. CPSC
 3. Flat Glass Manufacturers Association. FGMA
 4. Federal Specifications. FS
 5. Governing Codes and Ordinances
 6. National Glass Association
 7. International Building Code, 2000 edition.

1.03 WIND LOAD AND SAFETY REQUIREMENTS

- A. In-place glazing shall withstand the following wind loads acting normal to plane of glass surface:
1. Less than 30 feet above grade:
 - a. 35 p.s.f. positive pressure (acting inward) min and as required by International Building Code, **2021 edition**.
 - b. 35 p.s.f. negative pressure (acting outward) min and as required by International Building Code, **2021 edition**.
 2. 31 to 60 above grade:
 - a. 45 p.s.f. min and as required by International Building Code, **2021 edition**.
 - b. 45 p.s.f. min and as required by International Building Code, **2021 edition**.
- B. Install tempered glass at all glass entrances and adjoining sidelites and surfaces adjacent to walking surfaces as called for in the glazing code.

1.04 WEATHER CONDITIONS

- A. Do not proceed with installation of liquid sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed with glazing only when forecasted weather conditions are favorable to proper cure and development of high early bond strength.

1.05 SUBMITTALS

- A. Physical Samples: Submit for Architect/Engineer's review and approval the following items: *Tinted glass, insulated glass, spandrel glass, glazing film, and rated glass*. Samples will be reviewed by Architect/Engineer for appearance only. Compliance with all other requirements is the exclusive responsibility of the Contractor. *(Do not order glass prior to sample approval.)*
- B. Manufacturer's Literature: Submit two copies of manufacturer's specifications, recommendations and installation instructions for each type of glazing sealant and compound, gasket and associated miscellaneous material required. Include manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown. Show by transmittal that one copy of each recommendation and instruction has been distributed to the Glazier.

1.06 WARRANTY

- A. By accepting this Contract, the Contractor agrees to warrant his work for one year against becoming unserviceable or objectionable in appearance as a result of being defective or unconforming. Without limiting the warranty scope, the work shall be warranted not to leak or to break due to faulty installation.

PART 2 - PRODUCTS

2.01 GLASS

- A. Plate Glass: Clear and grey plate or float glass, complying with FS DD-G-451, Type 1, Class 1, Quality 3, 1/4" minimum thick
- B. Products offered by manufacturers complying with requirements include the following:
 - 1. ASG Float or Starlux; ASG Industries, Inc.
 - 2. Clear Float; Ford Glass Division.
 - 3. Parallel-O-Float or Parallel-O-Plate; Libby-Owens-Ford Company.
 - 4. Clear Float; PPG Industries.

2.02 TEMPERED GLASS

- A. Quality of Glass for Treatment: Furnish glass for tempering and heat strengthening which complies with FS DD-G-451, for type, thickness, class, and color indicated or specified.
- B. Tempered Glass:
 - 1. Temper glass by manufacturer's standard process to increase strength to not less than four times strength prior to tempering.
 - 2. Tolerances for flatness in any direction, any location except 2 inches wide border, for 1/4 inch thick glass (with inversely proportionate tolerances for thicker glass) shall not exceed the following:
 - a. For 1'-0" run: 1/16" bow
 - b. For 3'-0" run: 1/8" bow
 - c. For 7'-0" run: 1/4" bow
 - d. For 10'-0" run: 3/8" bow
 - 3. Thickness - 1/4 inch minimum.
Note Glazing for mullion-less system shall be 1/2" minimum, tempered glass with polished edges.
 - 4. Cut, fabricate or drill all tempered glass before tempering.
 - 5. Tong Marks: Support each piece of glass during strengthening so that tong marks will be concealed by glazing system.
 - 6. *Tempered Glazing at exterior doors shall be tinted to match insulated panels.*

2.03 INSULATED GLASS-

- A. General requirements for Insulated Glass: Provide hermetically sealed glazing units fabricated of two sheets 1/4" minimum, separated by +/- 1/2 inch dry air or gas filled space with -20 Degrees F dew point, and with a Class A sealant-type edge construction, fabricated to provide the following overall performance characteristics. Glazing shall meet above wind loading design requirements.
- B. Glass in Insulated Units: Heat-strengthened grey, bronze or green tinted glass (as selected by Architect) at exterior, heat strengthened clear glass on interior with Guardian SN68 or PPG Solarban 60 Low-E coating on #3 surface. Note that locations may require tempering of either or both panes. Insulation values shall be certified to meet the following:
 - Visible Light 38 to 41%
 - Reflectance 6%
 - Shading Coefficient .38

U-value Winter .29
U-value summer .30

- C. Edge Construction: Twin primary seals of polyisobutylene; tubular aluminum or galvanized steel spacer-bar frame with welded or soldered sealed corners, and filled with desiccant; and secondary seal outside of bar, bonded to both sheets of glass and bar, of polysulfide, silicone or hot-melt butyl elastomeric sealant (fabricator's option).
- D. Required Performance: Eight percent visible light transmittance, twenty percent maximum visible exterior light reflectance, eight percent maximum total solar energy transmission, and U-value of 0.42 maximum for winter at night.

2.04 FIRE RATED GLASS

- A. Products equal to Technical Glass Products meeting UL tests for rating of doors (*see door schedule*) or walls where located (*see fire plan*). Glazing shall be clear and impact safety rated - FireLite Plus or equal products.
- B. Install in all rated frames using approved glazing compound recommended by manufacturer.
- C. Glass shall bear label with the UL logo and fire rating.

2.05 GLAZING FILM (none anticipated at this time)

- A. Decorative Film to be applied to glazing where shown on drawings shall be selected from full range of patterns of Madico Window Films (www.madico.com) or approved equal.

2.06 SHEET MIRRORS

- A. 1/4 minimum float glass with silver coating.
- B. Edges shall be seamed (sanded smooth)

2.07 LAMINATED TRANSLUCENT GLASS

- A. 0.045 innerlayer film laminated between two 1/4" thick clear tempered glass units. All edges to be polished. (Film to be selected by architect as to amount of light that is filtered through. Provide a minimum of six different samples to be selected from.)

2.08 OTHER GLAZING MATERIALS

- A. Butyl Rubber Glazing Tape: Synthetic polymer based, non- shrinking 100% solid compound, 1/8 inch thick minimum.
- B. Elastic Glazing Compound for Channel Glazing: Two parts polysulfide sealant complying with FS TT-S-227, Class A, Type 2; compounded and tested to show a minimum of 20 years resistance to deterioration in normal glazing applications.
- C. Neoprene blocking, jamb shims and glazing gaskets for setting glass: Setting blocks used to support fixed glass shall be dense neoprene extrusions conforming to ASTM D395-69, Method B of between 70 and 90 Shore A Durometer hardness. Shore A Durometer hardness, length and location all to be as required and recommended in writing by the applicable glass manufacturer.
- D. Jamb shims used to center the glass shall be neoprene conforming to ASTM D395-69 Method B of between 40 and 50 Shore A Durometer hardness. Shore A Durometer hardness, length and location all as required and recommended by the applicable glass manufacturer.

- E. Fixed glazing gaskets shall be closed cell, extruded neoprene compression gaskets conforming to ASTM C509-66T, Grade 4. Gaskets shall be smooth and of profiles as indicated on Architect's drawings with integral locking projections, to engage the curtain wall components.
- F. Wedge glazing gaskets shall be high quality, elastomeric, ozone resistant virgin neoprene compound, conforming to AAMA Standard SG-1-76 and having a Shore A durometer hardness of between 65 and 75. Gaskets shall be smooth and of profiles and sizes required with continuous integral locking projections to engage the curtain wall components, and shall have vulcanized corners to form a continuous seal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces and items that are to receive glass. Correct unsatisfactory conditions.
- B. Correct defects that could interfere with proper glazing. Correct warped planes that could place glass in a strain when installed. Do not start glazing until unsatisfactory conditions have been corrected and approved.
- C. Proceeding with glazing work will be construed as evidence that surfaces to receive glass are in condition to permit satisfactory installation.

3.02 WORKING REQUIREMENTS

- A. Handle glass and glazing materials to avoid damage to materials or to work in place. Satisfactorily repair or remove and replace work that has been damaged.
- B. Protect glass from scratching, breaking or other injury while storing, during installation and until work is completed.
- C. Install temporary coverings necessary to prevent damage to finished surfaces during construction. Tape, or temporarily paint, markings on installed glass sufficient to clearly indicate that glass is in place.
- D. Do not remove labels from individual sheets of glass until glazing materials have been installed and approved.
- E. Store and handle glass and glazing materials to prevent damage to materials or structure. Remove broken and scratched glass promptly from site.

3.03 PREPARATION

- A. Cleaning
 - 1. Remove from glazing stops, legs or recesses, grease, oil, lacquer, dirt and other detrimental materials.
 - 2. Use methyl-ethyl-ketone (MEK) or other similar solvents not harmful to aluminum finish.
- B. Conditions:
 - 1. Surface shall be dry and free from frost.
 - 2. Unless otherwise recommended by sealant manufacturer, air temperature at elevation at which glazing with liquid sealants is to take place shall be 40 Degrees F or above.

3.04 SETTING BLOCKS

- A. Required: For glass sizes in excess of 50 united inches.

- B. Material: Neoprene; 70-90 Shore A durometer
- C. Size: 1/8 inch minimum thickness; length to suit load
- D. Location: At quarter points of sill

3.05 SPACER SHIMS

- A. Required: For glass sizes in excess of 50 united inches
- B. Omit: Where non-resilient tape is used and tape is sufficiently hard to resist squeezing out under wind load
- C. Materials: Resilient neoprene; 40-50 Shore A durometer
- D. Location: All four edges; on outside and inside; keep 1/4 inch below sight line; lap glass 1/8 minimum
- E. Size: 1 inch minimum length
- F. Number: Not less than two per edge; maximum 4'-0" o.c.

3.06 INSTALLING GLASS

- A. Installations shall be in accordance with the standards of the FGMS Glazing Manual, latest edition.

3.07 EXTERIOR GLAZING

- A. Install glazing in accordance with aluminum framing and window manufacturer's recommendations for each framing type shown.
- B. Install tempered glass where shown and elsewhere where required to meet CPSC safety standards and windloads.

3.08 GLAZING INTERIOR DOORS AND VISION PANELS

- A. Glaze interior doors and vision panels with specified glass.
- B. Provide wicket openings in glass where shown in dimensions and configuration indicated. Grind exposed edges smooth.
- C. Shim glass as required to install tightly, without warp or stress.

3.09 DRY GLAZING

- A. Install glass in aluminum entrances and frames using gaskets and materials supplied with system in accordance with aluminum frame manufacturer's recommendations.
- B. Grind edges of sliding glass doors in Architectural Woodwork.

3.10 GASKET GLAZING

- A. Install glass using structural gaskets in accordance with gasket manufacturer's instructions and recommendations.
- B. Cut loose zipper strips slightly long to ensure tight fit at corners.

- C. Use only special tool and lubricate to install zipper strip. Do not lubricate glass rabbet or flange rabbet.
- D. Comply with glass manufacturer's recommendations for the possible use of setting blocks, sealants and weepholes in glazing rabbets of structural gaskets.

3.11 WORKMANSHIP REQUIREMENTS

- A. Glass shall be free of distortion caused by installation.
- B. Glazing sealants shall be neatly formed and in proper place.

3.12 CLEANING

- A. Remove soil, stain and extraneous materials caused by glazing from glass and adjacent surfaces. Replace items that cannot be satisfactorily cleaned.
- B. Prior to completion of Project, remove labels, glazing materials, paint and other adhered materials from glass surfaces. Clean and polish surfaces of glass to be free from prints, soil, spots and foreign matter. Leave glass visibly clean when viewed from any angle.
- C. Remove and replace glass that is scratched, cracked, broken, discolored or defective.

END OF SECTION