

DIVISION 08

WINDOWS AND DOORS

SECTION 08220 - FIBERGLASS REINFORCED PLASTIC DOORS AND ALUMINUM FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Section includes fiberglass reinforced plastic (FRP) doors and frames.

1.02 REFERENCES

- A. Kentucky Building Code (KBC)
- B. American Society for Testing and Materials (ASTM) Specifications
 - 1. A 123 Zinc Coatings
 - 2. C 591-01 Unfaced Preformed Rigid Cellular Polyisocyanurate.
 - 3. C 728-97 Insulation Board, Mineral Aggregate
 - 4. E 330-97 Structural Load Test
 - 5. E 1996 Wind Load Test
 - 6. E 1886 Impact Test Procedures (inclusive of Large Missile Impact)
- C. Door and Frame Preparation for Hardware, American National Standard Institute Specifications (ANSI)
- D. Recommended Locations for Builder's Hardware, Door and Hardware Institute (DHI)
- E. Aluminum Association, Inc. (AA).
 - 1. AA5005-H14 – Sheet Architectural.
 - 2. AA6061-T6 Heavy Duty Structures.
 - 3. AA6063-T5 Extrusions, Pipe, Architectural.
 - 4. AA DAF-45 Designation System for Aluminum Finishes.
- F. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA 2603-98 Pigmented Organic Coatings
 - 2. AAMA 609 Anodized Architectural Finishes Cleaning and Maintenance.
 - 3. AAMA 611-98 Anodized Architectural Standards.

1.03 PERFORMANCE REQUIREMENTS

- A. Exterior FRP doors shall be designed to meet wind-loading requirements for the KBC. Refer to Structural Drawings for wind and design pressures.

1.04 SUBMITTALS

- A. Submit in accordance with Section 01300. Include copies of manufacturer's specifications for fabrication and installation including certifications, data and test reports substantiating that products comply with requirements.
- B. Submit shop drawings showing sizes and complete details of doors. Include details of core and edge construction, trim for openings and similar components. Include finishing specifications for doors to receive factory-applied shop finish.
- C. Provide a schedule of doors and frames using same reference designations for details and openings as indicated on the Contract Drawings.
- D. Furnish to the Owner six (6) copies of an Operating and Maintenance Data in accordance with Section 01730. The manual shall consist of maintenance instructions for doors and frames; catalog pages for each product; name, address and phone number of the local representative of each manufacturer; and copy of the approved shop drawings.

1.05 PRODUCT HANDLING

- A. Doors are to be stacked flat in a dry and protected area in original cartons prior to installation. Provide blocking or staging to protect door surfaces. Do not drag doors across one another. Lift doors and carry them into position. Identify each door with individual opening designations, as indicated on the approved shop drawings, using concealed markings.

1.06 WARRANTY

- A. Submit written agreement in door manufacturer's standard form signed by manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have separated, delaminated from the core, expansion of the core, or otherwise failed due to defects in material and workmanship, improper installation or corrosion from a specified environment, for a period of not less than five (5) years.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Marshall/Vega Corporation, Marshall, Arkansas.
- B. Cline Aluminum Doors, Inc., Bradenton Florida.
- C. Tiger Door, LLC
- D. Substitutions: Manufacturers and model numbers listed are to establish a standard of quality. Similar items by other manufacturers that are equal in design, function and quality will be considered for prior approval provided required data and physical samples are submitted under provisions of Section 01300.

2.02 FIBERGLASS REINFORCED PLASTIC (FRP) DOORS

- A. Aluminum Members: Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish.
- B. FRP Door Composite Components: Minimum 3-ply composite laminated construction to include:
 - 1. Facing: 0.120-inch (3.05 mm) composite FRP panel exterior grade, UV-protected fiber reinforced polyester panel on interior and exterior faces. Ultraviolet inhibitors shall be maximum amount formulated within the resin. Exterior and interior FRP panels shall be a Class C Flame Spread: Maximum of 75, and Smoke Developed Rating of 450 or less (ASTM E 84)
 - 2. Surface texture will be pebble embossed with a non-directional pattern.
 - 3. All mylar transporter fabrication film must be removed from FRP face sheets prior to door fabrication.
 - 4. FRP face panels shall be USDA accepted with minimal porosity.
 - 5. Face sheet shall be bonded to core and backup tube from edge to edge of door.
 - 6. FRP face sheets shall be a Class C Flame Spread: Maximum of 75 and Smoke Developed rating of 450 or less (ASTM E 84), for both interior and exterior faces of interior and exterior doors.
 - 7. Core: Organic materials shall be used to form a marine grade honeycomb core with high compression strength of 94.8 psi (ASTM C365), and internal aluminum hardware backup tube.
 - 8. Hardware Backup: The hardware backup tube shall be a minimum 4.25-inches (107.95 mm) in width, 1.375-inches (34.93 mm) in depth with a wall thickness of 0.125-inches (3.18 mm). Contiguous for the full perimeter of the door to allow for all specified and non-specified hardware reinforcement.
 - 9. Hardware Prep: Basic to include mortise lock edge prep or cylindrical lock prep; and pairs prepped for flush bolts, if required.
 - 10. Bonding Agent: Environmentally friendly adhesive with strength buildup of 350 pounds per square inch (24.6 kg/cm²).
 - 11. Perimeter Door Trim: Wall thickness of 0.050-inch (1.25 mm) minimum in 6063-T5 extruded aluminum alloy with special beveled edge cap design and integral weather stripping on lock stile.
 - 12. Replaceable Door Trim: Mechanically fastened to the hardware backup tube, allowing for replacement in the field, if damaged.
 - 13. Trim Finish: To have minimum of a Class I anodized finish.
 - 14. Weather stripping: Replaceable wool pile with nylon fabric, polypropylene backing meeting AAMA 701 standards. Applied weather stripping not acceptable.
 - 15. Materials: Only nonferrous, non-rusting members shall be acceptable, including tie rods, screws and reinforcement plates.

16. Regulations: All components and agents to meet EPA standards.
17. Color: As indicated on plans or, if not otherwise indicated, as selected by Owner from manufacturers' full range of standard colors.

C. Door Louvers:

1. Blades and Frames: 6063 –T5 extruded aluminum alloy, 0.062 inch minimum thickness. Louver blades shall be inverted "Y" type.
2. Insect Screens: 18-16 mesh, 0.111 inch diameter aluminum set in 6063 –T5 extruded aluminum alloy frame, 0.050 in minimum thickness.
3. Louver shall have minimum of 50% free air flow.

2.03 Aluminum Frames:

- A. Frame Components: Extruded channel (tubular) 6063-T5 aluminum alloy, minimum wall thickness 0.125 inches; cut corners square and joinery shall be mechanical with no exposed fasteners
- B. Profile: Open back with applied stop (OBS), 1.75 inches x 6".
- C. Hinge and Strike Mounting Plates: Extruded aluminum alloy bar stock, 0.187r thick mounted in concealed integral channel with no exposed fasteners.
- D. Door Stop: No screw on stops acceptable.
- E. Frame Finish: Shall be Clear anodic coating; AA-M12C22A31 Class II mechanical finish, non-specular, with chemical medium matte etch, minimum thickness 0.4 mil.
- F. Color: As indicated on plans or, if not otherwise indicated, as selected by Owner from manufacturers' full range of standard colors.

2.04 Accessories:

- A. Fasteners: Aluminum, nonmagnetic stainless steel, or other material warranted by manufacturer as non-corrosive and compatible with aluminum components.
 1. Do not use exposed fasteners.
- B. Brackets and Reinforcements: Manufacturer's high strength aluminum units where feasible, otherwise nonferrous stainless steel.
- C. Bituminous Coating: Cold applied asphaltic mastic, compounded for 30 mil thickness per coat.

2.05 OBSERVATION WINDOW FRP FRAME

- A. Provide observation window FRP frames as shown on Drawings and Schedules. Frames shall be double rabbeted, 1/8-inch minimum thickness FRP, depth as shown or scheduled, with 2-inch jamb and sill widths. Head section shall be heights as shown or required. Frames shall be fabricated with mitered and bonded corners with concealed fasteners. Provide glass stops and appropriate anchors for securely holding frames in walls.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify upon delivery that all doors and frames comply with the approved shop drawings and meet the indicated requirements for type, size, location and swing. Examine each opening for conditions that would prevent the proper application of doors, frames and related items. Do not proceed until defects are corrected.

3.02 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and approved shop drawings; set frames plumb, square, level, and aligned to receive doors.
- B. Anchor frames to adjacent construction in strict accordance with recommendations and approved shop drawings and within tolerances specified in manufacturer's instructions.
 - 1. Seal metal-to-metal joints between framing members using good quality elastomeric sealant.
- C. Where aluminum surfaces contact with metals other than stainless steel, zinc or small areas of white bronze, protect from direct contact by one or more of the following methods.
 - 1. Paint dissimilar metal with one coat of heavy-bodied bituminous paint.
 - 2. Apply good quality elastomeric sealant between aluminum and dissimilar metal.
 - 3. Paint dissimilar metal with one coat of primer and one coat of paint recommended for aluminum surface applications.
 - 4. Use non-absorptive tape or gasket in permanently dry locations.
- D. Hang doors with required clearances as follows:
 - 1. Hinge and Lock Stiles: 0.125 inch (3.18 mm).
 - 2. Between Meeting Stiles: 0.250 inch (6.35 mm).
 - 3. At Top Rails: 0.125 inch (3.18 mm).
 - 4. Between Door Bottom and Threshold: 0.125 inch (3.18 mm).
- E. Adjust doors and hardware to operate properly.
- F. Install hardware for doors of this section.
- G. Installation of door hardware is specified in Section 08710.

3.03 CLEANING

- A. Upon completion of installation thoroughly clean door and frame surface in accordance with AAMA 609.
- B. Do not use abrasive, caustic or acid cleaning agents.

3.04 PROTECTION

- A. Protect products of this section from damage caused by subsequent construction until substantial completion.
- B. Repair damage or defect products to original specified condition in accordance with manufacturer's recommendations.

- C. Replace damaged or defective products that cannot be repaired to the Architect's acceptance.

END OF SECTION

SECTION 08330 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Extent of overhead coiling doors is shown on drawings.
- B. Provide complete operating door assemblies including insulated door curtains, guides, counterbalance mechanisms, hardware, operators and installation accessories.

1.03 QUALITY ASSURANCE

- A. Furnish each overhead coiling door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.
- B. Unless otherwise acceptable to Engineer, furnish overhead coiling door units by one manufacturer for entire project.
- C. Inserts and Anchorages: Furnish and coordinate inserts and anchoring devices which must be set in concrete or built into masonry for the installation of the units. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.
- D. Wind Loading: Design and reinforce overhead coiling doors to withstand Building Code required wind load or a minimum of 20 lb. per sq. ft. wind loading pressure where Building Code requirement is less than 20 lb. per sq. ft.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, roughing in diagrams, and installation instructions for each type and size of overhead coiling door. Provide operating instructions and maintenance information, and complete information describing fire release system including electrical rough-in instructions.
- B. Shop Drawings: Submit shop drawings for special components and installations which are not fully dimensioned or detailed on manufacturer's data sheets.

1.05 WARRANTY

- A. Special Warranty: Submit a written warranty, executed by Contractor, Installer, and overhead door manufacturer, agreeing to repair or replace unit and components which fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to, structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation of hardware and operator system, and deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 1. Submit written warranty in accordance with Section 01740: Warranties and Bonds.
 - 2. Warranty period for aluminum windows is 3 years or 20,000 cycles after date of Substantial Completion.

PART 2 – PRODUCTS

2.01 PRODUCTS

- A. Manufacturers: Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
1. Overhead Door Corp. (Basis of Design).
 2. Atlas Door Corp.
 3. The Cookson Co.
 4. Cornell Iron Works, Inc.
 5. Kinnear Division, Harsco Corp.
 6. Mahon Rolling Door Division, RCM Corp.
 7. North American Rolling Door, Inc.
 8. Windsor Door Division, The Ceco Corp.

B. Sectional Doors

Provide complete operating sectional overhead door assemblies including door curtain, guides, counterbalance, hardware, manual operation, and installation accessories.

1. Aluminum Door Sections:

Extruded shapes of 6063-T6 alloy with wall section not less than 0.0625 inch thick for 1-3/4-inch-deep door sections. Facing panels of aluminum sheet set into continuous vinyl channels with rigid PVC snap-in moldings. Weld frame joints wherever possible, grind smooth where exposed. Use aluminum or stainless steel bolts and screws.

- a. Finish manufacturer's standard baked on satin finish.

2. Tracks, Supports and Accessories:

Manufacturer's standard galvanized steel, sized for door weight and dimensions, complete with ball-bearing roller guides, brackets, bracing and reinforcing. Provide continuous rubber or neoprene weather stripping at top, jamb and bottom of each door.

3. Hardware:

Manufacturer's standard to suit size and type of door. Provide lifting handles, cremone-type locking bars operable from inside. Provide interlock between locking mechanism and motor operator to ensure motor does not operate when door is locked.

C. Coiling Overhead Doors:

Provide complete operating overhead coiling door assemblies including door curtain, guides, counterbalance, hardware, operators, and installation accessories.

1. Door Curtain:

Interlocking insulated aluminum slats, 3/4" thick, for door width, as follows:

- a. Aluminum slats, 5052 alloy, standard mill finish, not less than 0.040 inch thick.

2. Bottom Bar:

Two angles not less than 1/8 inch thick of same metal as curtain slats. Provide flexible rubber, vinyl, or neoprene weather seal and cushion bumper. Provide unit with reversing edge for all motorized doors.

3. Curtain Jamb Guides:

Built up of ASTM A 36 steel angles, channels, and flat bars as required.

4. Weather Seals:

Manufacturer's standard rubber or neoprene on metal pressure bars. Provide 1/8-inch-thick, continuous sheet secured to inside of curtain coil hood. Provide lintel brush weatherseal at head of door.

5. Counterbalance:

Manufacturer's standard, adjustable, helical torsion spring mounted around steel shaft in barrel, with grease-sealed ball bearings or self-lubricating graphite bearings for rotating members.

6. Hood:

Enclose coiled curtain and operating mechanism and act as weather seal. Provide closed ends for surface-mounted hoods.

a. Aluminum, not less than 0.032 inch thick, mill finish.

7. Operation

Manual: Endless hot-dip galvanized hand chain of length so bottom of chain is four feet above finished floor. Provide sprockets and reduction gears for ease of operation and a maximum pull of 35 pounds.

Motor Operated: Provide heavy duty motor operator with open drip-proof motor, removable without affecting auxiliary hand chain or setting of limit switches. Furnish motor complete with controller, over-current protection and push-button station marked "Open-Close-Stop". Provide explosion-proof motor operator where required.

2.02 PAINTING

Shop clean and prime ferrous metal and galvanized surfaces, exposed and unexposed, except faying and lubricated surfaces, with door manufacturer's standard rust-inhibitive primer. Finish coating of door shall be factory applied manufacturer's finish for caustic environments. Color as indicated on drawings, or, if not otherwise indicated, as selected by Owner from manufacturers' full range of standard colors.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation:

Set track, door, and operating equipment complete with required hardware, jamb and head mold stops, anchors, inserts, hangers, and equipment supports according to manufacturer's installation instructions.

B. After installation, lubricate, test, and adjust doors to operate without warp, twist, or distortion.

END OF SECTION

SECTION 08370 - ACCESS HATCHES

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Provide all labor, materials, equipment, and service required for the complete installation of the access hatches and safety railing systems as specified herein and shown on the Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Cast-in-Place Concrete: Section 03300
- B. Precast Concrete: Section 03400

1.03 SUBMITTALS

- A. Submit manufacturer's data and shop drawings for the materials specified herein. Comply with all requirements of Section 01300.
- B. Descriptive literature, catalog cuts, and dimensional prints clearly indicating all dimensions and materials of construction, shall be submitted on all items specified herein to the Engineer for review before ordering.
- C. At the time of submission, the Contractor shall, in writing, call the Engineer's attention to any deviations that the submittals may have from the requirements of the Engineer's Contract Drawings and Specifications.

1.04 ACCEPTABLE MANUFACTURERS

- A. Access hatches shall be as manufactured by the Bilco Company, New Haven, Connecticut; Babcock-Davis Associates, Inc., Arlington, Massachusetts; Milcor Division Inryco, Inc., Milwaukee, Wisconsin; or approved equal.

PART 2 - PRODUCTS

2.01 ACCESS HATCH (ROOF)

- A. Access hatch shall be double leaf or single leaf, as indicated on the Contract Drawings or by the Engineer, aluminum, gutter type, watertight, exterior, flush floor hatch design. Door leaves shall be 1/4 inch aluminum diamond pattern plate to withstand a live load of 300 pounds per sq. ft. Channel frames shall be 1/4 inches aluminum with an anchor flange around the perimeter. Provide 1-1/2 inch female NPT threaded aluminum drainage coupling welded under frame at right front corner for connection of drain pipe.
- B. Door shall be equipped with 316 stainless steel hinges, a lockable hasp for use with a padlock, stainless steel pins, spring operator for easy operation and an automatic hold-open arm with release handle. Provide inside stainless steel snap locks with removable wrench lift handle outside. Furnish threaded aluminum plug to seal lock aperture. Hardware shall be cadmium plated.
- C. Doors and frames shall be mill finish with bituminous coating applied to the exterior of the frame. Hatches shall have an odor resistant gasket.
- D. Access hatches shall be furnished with a factory installed "Safe-Hatch" fall prevention system, as supplied by ITT Flygt Corporation, or Engineer approved equal. Safety grate shall

be constructed of 6061-T6 aluminum and designed to withstand a live load of 300 pounds per sq. ft. and painted with a bright safety orange color. The grating shall completely cover the opening and be in conformance with OSHA Standard 1910.23 and controlled space entry per OSHA Standard 1910.146.

E. Hatch shall have a minimum clear opening as shown on the contract drawings.

2.02 SAFETY RAILING SYSTEM

- A. Safety Railing System: Manufacturer's standard complete system including rails, clamps, fasteners, safety barrier at railing opening, all accessories required for a complete installation, and complying with 29 CFR 1910.23 requirements.
1. Height: 42 inches above finished roof deck.
 2. Pipe or Tube: 1-1/4-inch ID galvanized pipe or 1-5/8-inch OD galvanized tube.
 3. Flat Bar: 2-inch- high by 3/8-inch- thick galvanized steel.
 4. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
 5. Pipe Ends and Tops: Covered or plugged with weather-resistant material.
 6. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or to moisture from condensation or other sources.
 7. Fabricate joints that will be exposed to weather in a watertight manner.
 8. Close exposed ends of handrail and railing members with prefabricated end fittings.
 9. Fasteners: Manufacturer's standard.
- B. Basis of Design: "Bil-Guard" Hatch Railing System by The Bilco Company.

2.03 ACCESS HATCH FOR VAULTS, TANKS, AND MH STRUCTURES

- A. Access hatch for vaults and tanks shall be as described in section 2.01 A through D.
- B. Hatch shall have a minimum clear opening as shown on the contract drawings.

2.04 ACCESS HATCH (PUMPS)

- A. Pump access hatches shall be as described in section 2.01 A through D and furnished by the pump supplier, sized adequately to accommodate installation and removal of the pumps and piping.

2.05 ACCESS HATCHES (AASHTO H-20 RATED)

- A. Access hatch (h-20 rated) shall be double leaf or single leaf, as indicated on the Contract Drawings or by the Engineer, aluminum, gutter type, watertight, exterior, flush floor hatch design. Door leaves shall be 1/4 inch aluminum diamond pattern plate. Cover shall be reinforced to support AASHTO H-20 wheel loading with a maximum deflection of 1/150th of the span. Manufacturer shall provide structural calculations stamped by a professional engineer.
- B. Door shall be equipped with 316 stainless steel hinges, a lockable hasp for use with a padlock, stainless steel pins, spring operator for easy operation and an automatic hold-open arm with release handle. Provide inside stainless steel snap locks with removable wrench lift handle outside. Furnish threaded aluminum plug to seal lock aperture. Hardware shall be cadmium plated.
- C. Doors and frames shall be mill finish with bituminous coating applied to the exterior of the frame. Hatches shall have an odor resistant gasket.

PART 3 - EXECUTION

3.01 GENERAL

- A. Installation shall be in accordance with manufacturer's instructions.
- B. Manufacturer shall guarantee against defects in material of workmanship for a period of five years.
- C. Unit shall be set with slight pitch toward drain. Furnish and install 1" diameter schedule 80 PVC plastic drainage pipe and fittings to connect to gutter drainage coupling, set in concrete and run outside vault to daylight.

END OF SECTION

SECTION 08452 – INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL SKYLIGHT AND WALL SYSTEM

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Section includes the pre-engineered removable, self-supporting 2-3/4" insulated translucent sandwich panel center ridge skylight system, wall system, and accessories as shown and specified. Work includes providing and installing:
 - 1. Flat factory prefabricated structural insulated translucent sandwich panels
 - 2. Aluminum installation system
 - 3. Aluminum flashing attached to skylights
 - 4. Aluminum sill flashing

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Rough Carpentry: Section 06100
- B. Roofing: Section 07543
- C. Flashing and Sheet Metal: Section 07600
- D. Joint Sealers: Section 07900

1.03 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of skylight components.
- B. Submit shop drawings. Include elevations and details.
- C. Submit manufacturer's color charts showing the full range of colors available for factory-finished aluminum.
 - 1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
 - a. Sandwich panels: 14" x 28" units
 - b. Factory finished aluminum: 5" long sections
- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- E. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.
 - 1. Reports required are:
 - a. International Building Code Evaluation Report
 - b. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
 - c. Burn Extent (ASTM D 635)
 - d. Color Difference (ASTM D 2244)

- e. Impact Strength (UL 972)
- f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
- g. Bond Shear Strength (ASTM D 1002)
- h. Beam Bending Strength (ASTM E 72)
- i. Fall Through Resistance (ASTM E 661)
- j. Insulation U-Factor (NFRC 100)
- k. NFRC System U-Factor Certification (NFRC 700)
- l. Solar Heat Gain Coefficient (NFRC or Calculations)
- m. Condensation Resistance Factor (AAMA 1503)
- n. Air Leakage (ASTM E 283)
- o. Structural Performance (ASTM E 330)
- p. Water Penetration (ASTM E 331)
- q. Class A Roof Covering Burning Brand (ASTM E 108)

1.04 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope and location. At least three of the projects shall have been in successful use for ten years or longer.
 2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an accredited agency.
 3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with AC177 "Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems" as issued by the ICC-ES.
- B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified skylight systems for at least two consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

1.05 PERFORMANCE REQUIREMENTS

- A. The manufacturer shall be responsible for the configuration and fabrication of the complete skylight panel system.
1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 2. Standard skylight system shall have less than 0.01 cfm/ft² air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.
 3. Structural Loads; Provide skylight system capable of handling the following loads:
 - a. Live Load: 30 PSF
 - b. Snow Load: 30 PSF; Drift Load: L/60 deflection
 - c. Wind Load: 30 PSF
 - d. Positive Wind Load for wall units: 30 PSF

1.06 DELIVERY STORAGE AND HANDLING

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging.

- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.07 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work, which fails in materials or workmanship within one year of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering, defects in accessories, insulated translucent sandwich panels and other components of the work.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. The basis for this specification is for products manufactured by Kalwall Corporation. Other manufacturers may bid this project provided they comply with all of the performance requirements of this specification and submit evidence thereof. Listing other manufacturers' names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.

- B. Kalwall Corporation, Tel: (800) 258-9777 – Fax: (603) 627-7905 – Email: info@kalwall.com.

2.02 PANEL COMPONENTS

A. Face Sheets

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
 - b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
2. Interior face sheets:
 - a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 50 and smoke developed no greater than 250 when tested in accordance with UL 723.
 - b. Burn extent by ASTM D 635 shall be no greater than 1”.
3. Exterior face sheets:
 - a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south, determined by the average of at least three white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
 - b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact minimum of 70 ft. lbs. without fracture or tear when impacted by a 3-1/4” diameter, 5 lb. free-falling ball per UL 972.
4. Appearance:
 - a. Exterior face sheets: Smooth, .070” thick and Crystal in color.
 - b. Interior face sheets: Smooth, .045” thick and White in color.
 - c. Face sheets shall not vary more than ± 10% in thickness and be uniform in color.

B. Grid Core

1. Thermally broken I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16".
2. I-beam Thermal break: Minimum 1", thermoset fiberglass composite.

C. Laminate Adhesive

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives".
2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:
 - a. 50% Relative Humidity at 68° F: 540 PSI
 - b. 182° F: 100 PSI
 - c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
 - d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.03 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
1. Thickness: 2-3/4"
 2. Light transmission: 20%
 3. Solar heat gain coefficient 0.28.
 4. Panel U-factor by NFRC certified laboratory: 0.23
 5. Complete insulated panel system shall have NFRC certified U-factor of 0.28.
 6. Grid pattern: Nominal size 12" x 24"; Shoji.
- B. Standard panels shall deflect no more than 1.9" at 30 PSF in 10' 0" span without a supporting frame by ASTM E 72.
- C. Standard panels shall withstand 1200° F fire for minimum one hour without collapse or exterior flaming.
- D. Thermally broken panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.
- E. Skylight System:
1. Skylight system shall pass Class A Roof Burning Brand Test By ASTM E 108.
- F. Skylight System shall meet the fall through requirements of OSHA 1910.23 as demonstrated by testing in accordance with ASTM E 661, thereby not requiring supplemental screens or railings.

2.04 BATTENS AND PERIMETER CLOSURE SYSTEM

- A. Closure system:
 - 1. Thermally broken extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
 - 2. Skylight perimeter closures at curbs shall be designed to allow the skylight to be removed and replaced without dis-assembly of the skylight.
- B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.
- C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.
- D. Finish:
 - 1. Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color to be selected from manufacturer's standard color selection.

2.05 STRUCTURAL SUPPORT FOR STANDARD SKYLIGHT MODELS

- A. Center Ridge Skylights: Center Ridge Skylights to 22'-0" span shall have concealed support integral with the installation system. Options: exposed stiffeners as required by design loads. (Min slope of 18.43°).
- B. Aluminum curb cap extrusions and flashing shall be supplied.

PART 3 - EXECUTION

3.01 EXECUTION

- A. Installer shall examine substrates, supporting structure and installation conditions.
- B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Metal Protection:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install the skylight system in accordance with the manufacturer's suggested installation recommendations and approved shop drawings.
 - 1. Anchor component parts securely in place by permanent mechanical attachment system.
 - 2. Accommodate thermal and mechanical movements.

3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.

3.04 FIELD QUALITY CONTROL

- A. Water Test: Installer to test skylights according to procedures in AAMA 501.2.
- B. Repair or replace work that does not pass testing or that is damaged by testing and retest work.

3.05 CLEANING

- A. Clean the panel system interior and exterior, immediately after installation.
- B. Refer to manufacturer's written recommendations.

END OF SECTION

SECTION 08710 - FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

1.02 WORK INCLUDED

- A. This section includes the furnishing of all finish hardware to the respective trades. The hardware supplier will promptly furnish templates to all other manufacturers furnishing materials necessary to completion of this part of the work.
- B. The following specifications are a guide and a description of the quality of materials required. No material of quality or weight less than that outlined in this specification will be accepted or give consideration. The Contractor shall be responsible for supplying the correct quality of all materials, whether or not specifically mentioned in this specification. Any additional items that may be required shall be furnished and be of type, quality and utility consistent with other hardware specified.
- C. No consideration will be granted for any alleged misunderstanding of the material to be furnished or work to be done, it being fully understood that the tender of a proposal carries with it the agreement to all items and conditions referred to herein or indicated on the Drawings and as scheduled, whether specifically mentioned herein or not.
- D. The hardware supplier shall receive and check all hardware at his warehouse. All hardware shall be delivered to the job by the hardware supplier in one shipment. Drop shipments to the job site from the various manufacturers will positively not be permitted. All hardware shall be properly wrapped in separate packages complete with trimmings, screws, etc., (locksets packages complete in the same box), each plainly labeled and numbered to agree with the door numbers, and Contractor's typewritten schedule. The Contractor shall submit his schedules for corrections and shall obtain approval from the Engineer before proceeding with any work. The hardware supplier shall re-pack all separate boxes and packages of hardware, in cartons or cases, and attach to the outside of each case or carton a label indicating the manufacturer of the material, contents, quality, item number on hardware schedule and door number, before delivery to job site. Hardware, when required, shall be delivered to the shops of the various door manufacturers, properly marked and labeled following the same procedure outlined above for job site shipment.
- E. The Contractor shall provide proper storage facilities for the finish hardware after delivery to the job site. A separate room, under lock and key, with shelves and bins as necessary to provide dry storage for all hardware items will be required.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Hinges: All hinges to be of five knuckle construction with pins and plugs concealed in the barrel. Plain bearing and ball bearing hinges to be identical in appearance. Ball bearing hinges to have fully concealed bearings and self-lubricated sleeves for lateral wear. Hinges for all doors to be stainless steel with finish as indicated. 2 pair per door up to 90" high.
- B. Locksets: All locks shall be bored type. Lock bodies and trim shall be by the same manufacturer. Levers shall have screwless shank and no attachment screws shall be visible

on either face of doors. Latch bolts shall have a minimum throw of 5/8". Back set on all locks shall be 2-3/4".

- C. Closers: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use. Provide parallel arms for all overhead closers, except as otherwise indicated.
- D. Door Stops and Holders: Door stops shall be provided on all doors to prevent the door or hardware from striking an adjacent wall or obstruction. They shall be wall type whenever possible. Do not mount floor stops on exterior concrete stoops, or where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders. Contractor to verify if door closers will conflict with hardware selected. All door stops mounted on concrete floor or masonry walls shall be furnished with machine screws and lead expansion shields. Anchorage shall be rigid and firm before acceptance. Door holders shall be kick stops with rubber bottom surface.
- E. Weatherstripping: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes, and profiles shown or scheduled. Provide noncorrosive fasteners as recommended by manufacturer for application indicated.
- F. Thresholds: Extruded aluminum thresholds shall be furnished where called for in the hardware schedule. Thresholds shall be furnished with machine screws and lead expansion shields and shall be rigidly anchored to the floor.

2.02 FINISHES

Finish on all hardware hereafter specified unless specifically noted otherwise, shall be US32D (Satin Stainless Steel).

PART 3 - EXECUTION

3.01 MOUNTING

All hardware shall be firmly and rigidly attached to the doors and frames. Door closers, specified to be surface mounted shall be thrubolted to the door with oval head bolts. All door pulls and other surface mounted items shall be thrubolted to the door with oval head bolts, except push and kick plates. Outswinging doors shall have hinges with non-removable pins.

3.02 APPLICATION

Application - finish hardware shall be installed using mechanics skilled in this type of work. Installation shall be in a neat workmanship manner, in accordance with the approved hardware and door schedule. All items of hardware shall be secure and free working in the manner intended. Hardware shall not be applied until the painting is finished. After hardware is installed, the General Contractor shall cover all exposed surfaces of push plates, pulls, locksets, etc., with a suitable covering, such as masking tape and polyethylene trim, to protect the hardware from scratches, abrasion, and tarnishing. This is to be left on until the building is completed and ready for final inspection. Upon completion of application the Contractor shall deliver to the Owner, or to the Owner's maintenance personnel, two (2) copies of all installation instructions, templates, wrenches, installation tools, etc., supplied by the various manufacturers and packed with the hardware, necessary for installation and maintenance.

3.03 HARDWARE SCHEDULE

- A. Lists of hardware to be submitted by the Contractor shall be corrected as to quality and kind of hardware selected, but the Contractor must be responsible for all quantities and for the

hands of the locks, and must submit supplemental lists as necessary to cover any items of hardware not included in the original list.

- B. The General Contractor and the hardware supplier's representative shall conduct a pre-installation meeting on the project prior to hardware installation.
- C. Before an order is placed with the manufacturer for the hardware, six (6) copies of a complete schedule of the hardware, indicating the type, number, location and finish shall be submitted to the Architect/Engineer, together with such samples as may be required for approval. No hardware shall be shipped or delivered to the job until the Owner has approved the schedule and the samples. Approval of schedules and samples shall not relieve the Contractor of any responsibility for furnishing all hardware required.
- D. Acceptable Manufacturers: The numbers given in the schedule are of the following first listed manufacturers.

MANUFACTURERS USED:

Hinges	Hager or Mckinney Stanley
Locksets, Latchsets	Best , Schlage, Sargent, or Corbin Russwin
Closers	LCN or Norton, Dorma
Bolts	Ives or Glynn Johnson
Thresholds	Reese or National Guard
Weather Stripping	Reese or National Guard
Doorstops	Glynn Johnson or Ives
Door Holders	Glynn Johnson

HARDWARE:

SET NO.1A

DOUBLE DOORS (EXTERIOR)

4 pr. BB1191 Hinges 4 1/2" x 4 1/2" NRP
1 ea. Lockset 93K-20N15CS3626
1 ea. Single Dummy Trim to match
2 ea. Weatherstrip
1 pr. Flush Bolts FB458
1 ea. Closer 4114H-CUSH
2 ea. 407 Wall Stop
2 ea. Door Bottom & Drip DB593A
1 ea. Safety Hasps Hager 1915x4-1/2
1 ea. Threshold S205A

SET NO.1B

DOUBLE DOORS (INTERIOR)

4 pr. BB1191 Hinges 4 1/2" x 4 1/2" NRP
1 ea. Lockset 93K-20N15CS3626
1 ea. Single Dummy Trim to match
1 pr. Flush Bolts FB458
1 ea. Closer 4114H-CUSH
2 ea. 407 Wall Stop

SET NO 2

SINGLE DOORS (INTERIOR)

2 pr. BB1191 Hinges 4 1/2" x 4 1/2"
1 ea. Lockset 93K-20N15CS3626
1 ea. Closer 4114H-CUSH

1 ea. 407 Wall Stop

SET NO.3

SINGLE DOORS (EXTERIOR)

2 pr. BB1191 Hinges 4 1/2" x 4 1/2" NRP

1 ea. Lockset 93K-20N15CS3626

1 ea. Weatherstrip

1 ea. Closer 4114H-CUSH

1 ea. 407 Wall Stop

1 ea. Door Bottom & Drip DB593A

1 ea. Safety Hasps Hager 1915x4-1/2

1 ea. Threshold S205A

SET NO.4

SINGLE DOORS (EXTERIOR)

2 pr. BB1191 Hinges 4 1/2" x 4 1/2" NRP

1 ea. Single Panic Pushbar Rim Device ED 5200 x R1
(US26D finish) with ANSI 08 Exit level lock trim

1 ea. Weatherstrip

1 ea. Closer 4114H-CUSH

1 ea. 407 Wall Stop

1 ea. Door Bottom & Drip DB593A

1 ea. Safety Hasps Hager 1915x4-1/2

1 ea. Threshold S205A

1 ea. Lock Guard

1 ea. Stop (see Door and Frame Schedule)

SET NO.5

DOUBLE OVERSIZED DOORS (EXTERIOR)

1 ea. Continuous Heavy Duty SS Hinges

1 ea. Lockset 93K-20N15CS3626

1 ea. Single Dummy Trim to match

2 ea. Weatherstrip

1 pr. Flush Bolts FB458

1 ea. Closer 4114SHCUSH-CUSH WITH STOP AND HOLD OPEN

2 ea. 407 Wall Stop

2 ea. Door Bottom & Drip DB593A

1 ea. Safety Hasps Hager 1915x4-1/2

1 ea. Threshold S205A

END OF SECTION