

SECTION 084523 - SLOPED TRANSLUCENT METAL SKYLIGHT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flat factory prefabricated structural insulated translucent sandwich panels; with glazed endwalls.
2. Aluminum installation system.
3. Aluminum flashing.

B. Related Sections:

1. Masonry: Division 4.
2. Structural steel: Division 5.
3. Wood blocking: Division 6.
4. Joint sealants: Division 7.
5. Glazing for endwalls: Elsewhere in Division 8.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of components.
- C. Shop Drawings: Submit shop drawings. Include elevations and details.
- D. Color Charts: Submit manufacturer's color charts showing the full range of colors available for factory-finished aluminum.
- E. Samples: 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.
1. Sandwich panels: 14-inch x 28-inch units.
 2. Factory finished aluminum: 5 inch long sections.
- F. Certificates: Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- G. Product Reports: 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).
 - r. Daylight Autonomy.

1.4 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 10 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 panel systems for at least two consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

1.5 PERFORMANCE REQUIREMENTS

- A. The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.
 1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for its preparation.
 2. Standard panel 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, with L/60 deflection:
 - a. 30 PSF live load.
 - b. 30 PSF snow load.
 - c. 30 PSF wind load.
 - d. 0 PSF drift load.

1.6 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.

1.7 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 5 years 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 and defects in accessories, insulated translucent sandwich panels and other components of the work.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The approved manufacturer and basis of design are for products manufactured by Kalwall Corporation. Other manufacturers may submit bids for their products/systems provided they comply with all of the performance requirements of this specification and submit evidence thereof.

2.2 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 inch.
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 degrees 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-inch diameter, 5 lb. free-falling ball per UL 972.
4. Appearance:
 - a. Exterior face sheets: Smooth 0.070 inch thick and super-weathering Crystal in color.
 - b. Interior face sheets: Smooth 0.045 inch thick and Crystal S-171 in color.
 - c. Face sheets shall not vary more than $\pm 10\%$ 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 inch.

2. I-beam thermal break: Minimum 1 inch, 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.

2.3 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 inches.
 2. Light transmission: 30%.
 3. Solar heat gain coefficient: 0.32.
 4. Panel U-factor by NFRC certified laboratory: 2-3/4-inch thermally broken grid 0.23 "U".
 5. Complete insulated panel system shall have NFRC certified U-factor of 0.31 "U".
 6. Grid pattern: Nominal size 12-inch x 24-inch shoji grid pattern.
- B. Standard panels shall deflect no more than 1.9 inches at 30 PSF in 10 foot 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. System shall pass Class A Roof Burning Brand Test by ASTM E 108.
2. 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.

2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure System:

1. Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
2. Skylight perimeter closures at curbs shall be factory sealed to panels.

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: Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color to be selected by the Architect from manufacturer's full range of standard colors.

2.5 STRUCTURAL SUPPORT

A. Center Ridge Skylight: Self-supporting Center Ridge Skylight at 19 feet outside curb dimension span shall have concealed support integral with the installation system with exposed gussets at ridge. Aluminum curb cap extrusions and flashing shall be supplied by the skylight manufacturer.

B. Skylight shall have gabled glass endwalls glazed with 1 inch thick tempered low E clear insulated glass (glass and glazing specified elsewhere in Division 8).

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 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.

3.3 INSTALLATION

- A. Install the panel system in accordance with the manufacturer's 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.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 FIELD QUALITY CONTROL

- A. Water Test: Test skylight system 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 the work.

3.5 CLEANING

- A. Clean the panel system inside and outside, immediately after installation.
- B. Comply with manufacturer's written recommendations.

END OF SECTION 084523

