

DIVISION 8 – OPENINGS

SECTION 08 62 00

PLASTIC UNIT SKYLIGHTS

Items in blue indicate specification comments or choices to be selected, deleted or filled in as appropriate.

I. GENERAL

A. Work Included:

1. Single source factory fabricated and installed aluminum clear span pre-engineered skylight structure with framework, acrylic or polycarbonate and glazing.
2. Sill cap flashing and other required flashings, anchorages, sealant, closures, attachments and other equipment as described herein for a complete watertight installation.
3. Engineering and drafting of production documents.
4. Shop drawing submittals.
5. Applied finish to aluminum extrusions and flashings.

B. Related Work Not Included:

1. Section 05120: Structural Steel.
2. Section 05160: Space Frames.
3. Section 05500: Metal Fabrications.
4. Section 07600: Flashing and Sheet Metal.
5. Section **xxxxx**: Roofing.
6. Section **xxxxx**: Sealants.

C. Standards:

1. Comply with the standards that are applicable to the work of this Section except as otherwise indicated. Provide assembly that is weather tight, airtight and Department of Industry, Labor and Human Relations approved.
2. Aluminum Association Incorporated (AA):SAS-30 Specifications for Aluminum Structures.
3. American Architectural Manufacturers Association (AAMA):
 - i. 1600 Voluntary Specification for Skylights
 - ii. 2603-98 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - iii. 2604-98 Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
 - iv. 611-98 Specification for Anodized Architectural Aluminum.
 - v. 1605.1 Voluntary Standard Uniform Load Test Procedure for Plastic Glazed Skylights by Uniform Static Air Pressure Difference.

4. American National Standards Institute (ANSI): Z 97.1 -1984- Safety Glazing Materials Used in Buildings -Safety Performance Specifications and Methods of Test.
5. American Society for Testing and Materials (ASTM):
 - i. C719: Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cycle Movement.
 - ii. C794: Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants.
 - iii. D395: Test Methods for Rubber Property -Compression Set.
 - iv. D412: Test Methods for Rubber Properties in Tension.
 - v. D1171: Test Method for Rubber Deterioration -Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens).
 - vi. D4802 Specification for Poly (Methyl Methacrylate) Acrylic Plastic Sheet.
 - vii. D2240: Test Method for Rubber Property -Durometer Hardness.
 - viii. E283: Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
 - ix. E330: Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
 - x. E331: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
6. Consumer Product Safety Commission (CPSC): 16CFR 1202 - Architectural Glazing Standards and Related Material.
7. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

D. Submittals:

1. Prior to starting fabrication, submit manufacturers' product specifications, test results showing compliance with performance criteria described below, complete shop drawings, handling installation and protection instructions. Indicate pertinent dimensioning, general construction, component connections and locations, anchorage methods, locations and installation details.
2. Provide pairs of samples for initial color selection on 12" long sections of extrusions or formed shapes. Where normal color variations are anticipated, include two or more units in each set indicating limits of color variations.
3. Submit structural calculations prepared in accordance with the Aluminum Association's Specifications for Aluminum Structures (SAS30) by a structural engineer qualified in the design of self-supporting sloped glazed systems and licensed to practice in the state where the skylight is manufactured.
4. Submit only if specifically requested:
 - i. Submit (2) 12-in. x 12-in. samples of each type of acrylic or polycarbonate.
 - ii. Submit (2) manufacturer's samples of each type of sealant.
 - iii. Submit (2) 6-in. long samples of extrusions (with appropriate finish).
 - iv. Submit (3) sets of as-built drawings and cleaning and maintenance manuals
 - v. Certification that insulating acrylic or polycarbonate units will withstand specified design loads.

E. Quality Assurance:

1. The skylight installers must be permanent full-time employees of the skylight manufacturer.
2. Engage a single source manufacturer/installer for the metal-framed skylights. Skylight source will assume undivided responsibility for all components, including structural design, engineering, fabrication, finishing, preparation at the job site, erection and glazing of the skylight system and the weatherproof integrity of the system in place.

3. The manufacturer shall be regularly engaged in the preceding phases of construction of skylights and able to demonstrate that he has performed successfully on comparably sized projects and of comparable design complexity over at least the previous ten years.

F. Design Loading requirements:

1. Roof and snow live loads [select for local code: 30 \(40\) \(60\)](#) psf or applicable drifted snow loads per the applicable building code.
2. Wind live load [as appropriate for local code: 20 psf](#), exposure classification C (B) as applicable, stagnation pressure 17 psf.
3. American National Standard “Minimum Design Loads for Buildings and Other Structures” ANSI A58.1 -- latest edition.
4. Design assembly to safely carry all dead, snow, wind, thermal and building movement loads, as well as any additional service and construction loads.
5. The deflection of a framing member in a direction parallel to the plane of the acrylic or polycarbonate, when carrying its full dead load, shall not exceed an amount which will reduce the acrylic or polycarbonate or panel bite below 75% of the design dimension and the member shall have a 1/8-in. minimum clearance between itself and the edge of the fixed panel, acrylic or polycarbonate, or component immediately adjacent, nor shall it impair the function of or damage any joint seals.
6. Deflection of members shall not exceed design span divided by 175 (L/175) or one (1) inch for clear spans under 20-ft., or L/240 for clear spans greater than 20-ft.

G. Performance:

1. When tested in accordance with ASTM E-283, air infiltration shall not exceed .06 cfm/sf of fixed area at a test pressure of 6.24 psf.
2. When tested in accordance with ASTM E-331, there shall be no uncontrolled water penetration at a test pressure of 12.0 psf.
3. When tested in accordance with NRFC 100-91/ASTM C 1199/ASTM E 1423, the thermal performance Condensation Resistance Factor (CRF) shall be 52 or higher.
4. The system shall perform to these criteria under a combined load as dictated by the state building codes for dead load and live load.
5. Thermal Movement: Provide for such expansion and contraction of component materials as will be caused by the ambient surface temperature range without buckling, stress on acrylic or polycarbonate, failure of seals, undue stress on structural elements, reduction of performance or other detrimental effects.
6. Where permitted by code, a 1/3 increase in allowable stress for wind or seismic load shall be acceptable, but not in combination with any reduction applied to combined loads. In no case shall allowable values exceed the yield stress.
7. Compression flanges of flexural members may be assumed to receive effective lateral bracing only from anchors to the building structure and horizontal glazing bars or interior trim which are in contact with 50% of the member's total depth.
8. The skylight framing is designed to be self-supporting between the support construction. The skylights will impose reactions to the support construction. All adjacent and support construction must support the transfer of all loads including horizontal and vertical, exerted by the skylights. Design or structural engineering services for the supporting structure or building components not included in the skylight scope are not included under this section.
9. Limited reaction design “LRD”: [If this item is to be included, delete the item immediately above.](#) The skylight framing is to be designed to exert no horizontal

reactions under vertical gravity type loads, (dead, snow, live). Unbalanced live loads, (wind, seismic, etc.), acting upon the skylight will produce horizontal reactions that cannot be controlled by the skylights, but must be resisted by the support structure.

H. Warranty:

1. Provide written warranty from the skylight manufacturer stating that all work of this Section will remain free from defects in materials and workmanship. The work shall remain free of leaks, defective design, defective materials and construction for (2) (5) (10) years after the date of acceptance.
2. Provide written warranty stating that all acrylic or polycarbonate units will remain free of delamination, discoloration and defects in manufacture for (2) (5) (10) years after the date of acceptance.

II. PRODUCTS

A. Manufacturers:

1. The specifications are based on the skylight products of Wisconsin Solar Design Inc., www.wisconsinsolardesign.com, 800-443-1639, fax 608-836-5933. The following manufacturers will be accepted when complying with the specifications herein: Wasco Products, Inc., www.wasco1.com, 800-388-0293, fax: 207-490-5270, and Major Industries, www.majorskylights.com, 888-759-2678, fax: (715) 848-3336
2. Other manufacturers must pre-qualify with the Architect prior to the bid closing date.

B. Materials:

1. Skylights Mounted on Curb by others: Factory assembled units consisting of plastic dome, 0.062" extruded aluminum frame and 0.125" extruded aluminum dome retaining angle. Skylight frame shall have an integral condensate gutter with weep slots. Weep slots shall be protected from weather and air-borne debris. Curb frame shall be predrilled for anchorage to curbs.
 - i. Type: (select: single dome, double dome, pyramid single dome, pyramid double dome, thermalized double dome, thermalized pyramid double dome).
 - ii. Integral Insulated Curb Height above roof deck: (9") (12").
 - iii. Glazing: Acrylic or polycarbonate plastic glazing.
 - iv. (Outer) Dome Color: (select: colorless, white, bronze, gray).
 - v. Inner Dome Color: (select: colorless or white).
 - vi. Frame Finish: Manufacturer's standard painted Class I Architectural (insert color -- stocked colors are clear, dark bronze or white, all colors available) factory applied, oven baked high performance two-step fluorocarbon painted finish or an Architectural Class I color anodized finish (insert color selected here) with a 0.7 mil minimum film thickness, conforming to Aluminum Association Standard AA-M21C22A42/A44 and AAMA 606.1 or AAMA 608.1.
 - vii. Condensation Control: (Non-thermalized type shall have sufficient drainage slots to carry all moisture to the outside.) (Thermalized type shall have poured and debridged polyurethane thermal break; corners shall be factory sealed.)
 - viii. Size: (Insert outside curb dimensions here if not indicated on drawings).

- ix. Fasteners: ASTM B221 2024-T4 aluminum or 300 series stainless steel with integral color coating to match finish of aluminum where exposed to view; cadmium plated steel for connections to supporting structure.
 - x. Glazing gaskets -- manufacturer's standard.
 - xi. Setting blocks -- extruded Type II silicone rubber, manufacturer's standard.
 - xii. Sealant -- High performance silicone sealant applied in accordance with manufacturer's recommendations
 - xiii. Performance Minimums:
 - a. Air Infiltration per ASTM E283 shall be < .01 cfm/cu.ft @ 6.25 psf negative pressure.
 - b. Water Penetration per ASTM E331 shall pass at 15 psf negative pressure.
2. Roof Deck Mounted Skylights Including Integral Curb: Factory assembled self-flashing units consisting of plastic domes, 0.062" extruded aluminum curb frame, 0.062" extruded aluminum retaining angle, double wall insulated curb. Skylight frame shall have an integral condensate gutter with weep slots. Weep slots shall be protected from weather and air-borne debris. The curb shall have a 3" roof flange and house a 3/4" layer of insulation. (Curbs shall be thermally broken when thermalized models are specified).
- i. Type: (select: single dome, double dome, pyramid single dome, pyramid double dome, thermalized double dome, thermalized pyramid double dome).
 - ii. Integral Insulated Curb Height above roof deck: (9") (12").
 - iii. Glazing: Acrylic or polycarbonate plastic glazing.
 - iv. (Outer) Dome Color: (select: colorless, white, bronze, gray).
 - v. Inner Dome Color: (select: colorless or white).
 - vi. Frame Finish: Manufacturer's standard painted Class I Architectural (insert color -- stocked colors are clear, dark bronze or white, all colors available) factory applied, oven baked high performance two-step fluorocarbon painted finish or an Architectural Class I color anodized finish (insert color selected here) with a 0.7 mil minimum film thickness, conforming to Aluminum Association Standard AA-M21C22A42/A44 and AAMA 606.1 or AAMA 608.1.
 - vii. Condensation Control: (Non-thermalized type shall have sufficient drainage slots to carry all moisture to the outside.) (Thermalized type shall have poured and debridged polyurethane thermal break; corners shall be factory sealed.)
 - viii. Size: (Insert outside curb dimensions here if not indicated on drawings).
 - ix. Fasteners: ASTM B221 2024-T4 aluminum or 300 series stainless steel with integral color coating to match finish of aluminum where exposed to view; cadmium plated steel for connections to supporting structure.
 - x. Glazing gaskets -- manufacturer's standard.
 - xi. Setting blocks -- extruded Type II silicone rubber, manufacturer's standard.
 - xii. Sealant -- High performance silicone sealant applied in accordance with manufacturer's recommendations
 - xiii. Performance Minimums:
 - a. Air Infiltration per ASTM E283 shall be < .01 cfm/cu.ft @ 6.25 psf negative pressure.
 - b. Water Penetration per ASTM E331 shall pass at 15 psf negative pressure.

III. EXECUTION

A. Delivery:

1. Deliver fabricated units and component parts to the jobsite completely identified with labels corresponding to the erection drawings. Protect surfaces from damage during shipping. Inspect materials for damage upon delivery to the jobsite. Touch-up or replace items with minor defects or scratches with the appropriate material.

B. Pre-installation:

1. The furnishing of temporary covering, weatherproofing and protection of the skylight area before and after the skylight installation are excluded from the work of this section.

C. Installation:

1. Prior to the installation of the skylight system, arrange for the representative of the skylight manufacturer to examine the structure and substrate to determine that they are properly prepared, sized and ready to receive the skylight work specified herein.
2. Assist general contractor to coordinate installation with adjacent work such as roofing, sheet metal and other work to ensure a complete weatherproof assembly.
3. Contact between aluminum and dissimilar metals shall receive a protective coating at asphalt paint for the prevention of electrolytic action and corrosion.
4. Install skylight frame, acrylic or polycarbonate and accessory items as needed in accordance with the manufacturer's printed instructions matching profiles, sizes and spacing indicated on approved shop drawings.
5. During installation, remove labels, part number markings, sealant smears, handprints, and construction dirt from all components. Touch-up damaged coatings and finishes and repair minor damage to eliminate all evidence of repair. Remove and replace work that cannot be satisfactorily repaired.
6. Anchor work securely to supporting structure, but allow for differential and thermal movement.
7. Erect system plumb and true and in proper alignment and relation to established lines and grades as shown on the approved shop drawings.
8. Handle acrylic or polycarbonate in accordance with the recommendations of the FNMA, latest edition. Use rubber spacers to maintain separation of acrylic or polycarbonate and adjacent metal framework.
9. Touch-up areas damaged during installation.
10. Locate weep holes in sill to positively drain condensation to exterior of skylight at each rafter connection.
11. Sealants to be installed per sealant manufacturers' instructions.
12. Before application, remove mortar dirt, dust moisture and other foreign matter from surfaces sealant will contact. Apply sealant in a tooled and uniform manner to completely fill joint. Remove excess sealant to leave uniform smooth edge.

D. Site Tolerances:

1. All supporting and adjacent construction will be held to within + 1/2" of theoretical.
2. Tolerances for the installation of related products: Refer to the sections noted in the "Related Work Not Included" paragraph above for specified tolerances for adjoining construction.

E. Cleaning:

The skylight subcontractor is required to leave acrylic or polycarbonate and metal surfaces clean at the conclusion of the installation. Final cleaning is generally performed by the

general contractor, not the skylight subcontractor, just prior to acceptance of the project by the owner.

Cleaning: Remove any temporary skylight coverings and protection of adjacent work areas at the completion of skylight installation. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

END OF SECTION 08 62 00