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EDGE[®] SYSTEMS

“TRANSLUCENT GLAZING SYSTEM” Guide Specification

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Engineering and drafting of production documents, including structural calculations of the entire skylight system.
- B. Fabrication and erection of skylight frames.
- C. Fabrication and erection of the aluminum gutter system including, when applicable, insulation and pitched liners.
- D. Applied finish of aluminum extrusions and sheet.
- E. Skylight polycarbonate glazing.
- F. Skylight related flashings.

1.02 RELATED SECTIONS

- A. Structural Steel: *Division 05*
- B. Space Frames: *Division 05*
- C. Metal Fabrications: *Division 05*
- D. Flashing and Sheet Metal: *Division 07*
- E. Translucent Wall & Roof Assemblies: *Division 08*
- F. Glazing: *Division 08*
- G. Glazed Curtain Walls: *Division 08*
- H. Roofing: *Division 07*
- I. Sealants: *Division 07*

1.03 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Extruded aluminum members with a system of alternate serrations for attachment of exterior polycarbonate retainers with 1/4-in. x 20 stainless steel screws.
 - 2. Condensation guttering system integral with skylight framing members for positive drainage of condensation.
- B. Performance Requirements:
 - 1. Structural Members: Of sufficient sizes to support design loads as prescribed by governing building codes.

2. The deflection of the framing member in a direction normal to the glazing plane of when subjected to a uniform load deflection test in accordance with ASTM E330, and per the above specified loads, shall not exceed L/100.
3. Water Penetration: No water penetration shall occur when the system is tested in accordance with ASTM E331 using a differential static pressure of 20% of the inward acting design wind load pressure, but not less than 7 psf. Water penetration is defined as the appearance of uncontrolled water other than condensation on the interior surface of any part of the skylight.
 - a. Drain water penetrating at joints as well as condensation occurring within the system to exterior face of the work.
4. Thermal Movement: Provide for expansion and contraction of component materials as will be caused by an exterior surface temperature range of plus or minus 85 °F, ranging from -20 °F to 150 °F, and an interior surface temperature range of (+/-) 40 degrees F, ranging from 40 °F to 120 °F. Adjustments in the exterior and interior temperature ranges should be made, based on specific project locations and conditions. The skylight system should allow for thermal movements without buckling, sealant failure, undue material stress, and other detrimental affects.
5. 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.
6. 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.
7. Skylight framing is designed to be self-supporting between the support construction. The skylight(s) 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 skylight(s). Design or structural engineering services for the supporting structure or building components, not included in the skylight scope are not included under this section.

1.04 SUBMITTALS

- A. Submit [_____] copies of shop drawings plans, elevations, and section as required to fully describe the skylight construction for the Architects' approval prior to starting fabrication.
- B. Submit structural calculations prepared in accordance with the Aluminum Association's Specifications for Aluminum Structures (SAS30) by a [civil] [_____] engineer qualified in the design of self-supporting sloped glazed systems licensed in (state where skylight is to be installed)[_____].
- C. Submit test reports from an independent recognized testing laboratory, or a full size system sample, showing the skylight system has been designed to allow the glazing material to expand and contract in both the X and Y axis. In lieu of test reports, a full size skylight sample may be submitted to the architect for his approval.
- D. Submit [_____] 12-in. x 12-in. samples of the glazing material.
- E. Submit [_____] 12-in. long snap-on cap.
- F. Submit [_____] 6-in. long samples of extrusions (with appropriate finish).
- G. Submit [_____] sets of as-built drawings and cleaning and maintenance manuals upon completion of skylight installation.

1.05 QUALITY ASSURANCE

- A. Work of this Section, including design, engineering, fabrication, finishing, preparation at the job site, erection and glazing of the skylight system shall be the responsibility of the skylight manufacturer. 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 ten (10) years.

1.06 WARRANTY

- A. Submit manufacturer's warranty certifying that skylight work was furnished and installed in accordance with the Contract Documents.
- B. Certify that skylight system is free of defects in design, material, and construction for a period of ten (10) years from the Date of Skylight Completion including, but not limited to, leakage, thermal stress, buckling, oil canning, seal failure, audible noises due to expansion and contraction .
- C. Warrant polycarbonate against defective materials, color change and hail damage per the polycarbonate manufacturer's ten (10) year prorated warranty.
- D. Warrant structural sealant for a period of ten (10) years per sealant manufacturer's standard warranty of merchantable quality. Warranty shall certify that cured sealant:
 - 1. Will not become brittle or crack due to weathering or normal expansion and contraction of adjacent surfaces.
 - 2. Will not harden beyond a Shore A durometer of 50, nor soften below a minimum of points.
 - 3. Will not change color significantly when used with compatible back-up materials.
 - 4. Will not bleed significantly.
- E. Warrant finish per the manufacturer's standard warranties.
- F. Optional extended warranties may be available on some products at an additional cost.
- G. Warranty service becomes effective only following payment in full for the contract amount.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Contract documents are based on products manufactured by Super Sky Products, Inc.; 10301 N. Enterprise Drive; Mequon, WI 53092; Phone (800) 558-0457, (262) 242-2000; Fax (262) 242-7409; www.supersky.com.
- B. Other manufacturers will be considered when the following conditions have been met.
 - 1. Optional manufacturers must pre-qualify to bid not less than fourteen (14) days prior to the bid closing date.
 - 2. Complete details are submitted for review by the Architect showing compliance to the drawings and Contract Documents.
 - 3. Submit system sample showing system's ability to expand and contract in both the X and Y axis.
 - a. Systems which mechanically fasten the glazing material are not allowed.
 - 4. Certify that system will not be audible to the human ear during a twenty-four hour expansion and contraction cycle.
 - 5. Submit a 12-in. square sample of cellular glazing material.
 - a. Glazing material with a ribbed interior surface plane(s) is not allowed.
 - b. Multi-cellular glazing material shall have a minimum .7-in. on center, vertical inner wall spacing and a maximum of six horizontal layers.
 - 6. Certify that the glazing material freely allows condensation to weep from system and that condensation will not significantly affect light transmission values.
 - 7. Certify that the glazing material does not have any "blinding" optical characteristics during the daylight period for 365 days.
 - 8. Submit a 12-in. long sample of the anti-dust impermeable tape.
 - 9. Submit a 12-in. long sample of the aluminum retainer.

2.02 MATERIALS

- A. Framework:
 - 1. Principal Supporting Members: 3mm minimum thickness extruded aluminum, alloy 6005-T5 or 6061-T6 per ASTM B221. Sizes, shapes and profiles as indicated on the Contract Drawings.
 - 2. Snap-on Covers and Miscellaneous Non-supporting Trim: 1.5mm minimum thickness extruded aluminum, alloy 6063-T5 per ASTM B221.

3. Supporting aluminum gutters: thickness as prescribed by skylight engineer, based on skylight reactions and applied design loads.
 4. Principal Formed Metal Members: 3mm minimum thickness aluminum, alloy [5052] [6061-T6] per ASTM B209.
- B. Glazing Strips:
1. Extruded EDPM rubber designed to comply with the following specifications:
 - a. Hardness: ASTM D2240, Type A: Durometer 50 (+/-5).
 - b. Tensile Strength: ASTM D412. 800 psi (min.).
 - c. Elongation: 300% (min.).
 - d. Color: Black.
 2. Compression Set: ASTM D395 Method B, 22 hours @ 212 °F: 25% (max.).
 3. Heat Aging Characteristics:
 - a. 70 hours @ 212 °F.
 - b. Hardness: ASTM D2240, Type A: Durometer 50 (+/-5).
 - c. Tensile Change: ASTM D412. -10%.
 - d. Elongation Change: ASTM D412: -20%.
 4. ASTM D1171 Weather Resistance at 1 Part Ozone per Million, 500 hours at 20% Elongation: No cracks.
 5. No visual checks, cracks or breaks after completion of tests.
- C. Fasteners:
1. For Exterior Cap Retainers: ASTM A193 B8 300 series stainless steel screws.
 2. For Framework Connections: ASTM B211 2024-T4 aluminum, ASTM A193 B8 300 series stainless steel, and ASTM B316 aluminum rivets, as required by connection.
 3. For Anchoring Skylight(s) to Support Structure: ASTM A307 zinc plated steel fasteners.
 4. Exposed stainless steel truss head mechanical fasteners are utilized in accordance with standard connection details.
- D. Flashing:
1. 5005 H34 aluminum .040-in. minimum thickness.
 2. Sheet metal flashings/closures/claddings are to be furnished shop formed to profile in min. 10-ft. lengths, when lengths exceed 10-ft. Field trimming of the flashing and field forming the ends is necessary to suit as-built conditions. Sheet metal ends are to overlap 6-in. to 8-in. minimum, set in a full bed of sealant and riveted if required.
- E. Exposed metal finish [interior and exterior] [interior] [exterior] to comply with the following:

The following is a listing of all types of finishes that can be specified, therefore, only those finishes that apply should be used in an individual specification.

- 1 High Performance Pigmented Organic Coatings: AAMA 2605-05 [2-coat] [3-coat] [4-coat] min. 70% PVDF fluropolymers [standard] [custom] [mica] [exotic] [metallic].
 2. Pigmented Organic Coatings: AAMA 2604-05 [2-coat] min. 50% PVDF fluropolymers [standard] [custom] [mica].
 3. Anodized Coatings:
 - a. AAMA 611-98 Architectural Class I clear anodized Type AA-M10C22A41: **215-R1**.
 - b. AAMA 611-98 Architectural Class I electrolytically deposited color anodized Type AA-M10C22A44: [light bronze] [medium bronze] [dark bronze] [black].
- F. Polycarbonate Glazing Panels:
- 1A. **10mm** Thermal and solar performance:
 - a. Insulation Value ("U") per ASTM C236 configured for/or NFRC 100 .52.
 - b. Light Transmission / ; Quadrants (L.T.%) per ASTM E1175.
 - c. Solar Transmission / ; Quadrants (L.T.%) per ASTM #1084.
 - 1B. **16mm** Thermal and solar performance:
 - a. Insulation Value ("U") per ASTM C236 configured for/or NFRC 100 .40.
 - b. Light Transmission / ; Quadrants (L.T.%) per ASTM E1175.
 - c. Solar Transmission / ; Quadrants (L.T.%) per ASTM #1084.
 - 1C. **25mm** Thermal and solar performance:
 - a. Insulation Value ("U") per ASTM C236 configured for/or NFRC 100 .26 to .32.
 - b. Light Transmission / ; Quadrants (L.T.%) per ASTM E1175.
 - c. Solar Transmission / ; Quadrants (L.T.%) per ASTM #1084.

2. Flammability
 - a. The exterior and interior faces shall be an approved light transmitting panel with a CC1 fire rating classification per ASTM D-635. Smoke density no greater than 50 (10mm) or 250 (16mm) per ASTM D2843 and self-ignition temperature of 1058°F per ASTM 1929.
 - b. The exterior and interior faces shall have a flame spread per ASTM E84 of 5 for 10mm and 55 for 16mm.
3. Weatherability:
 - a. The exterior and interior faces shall not change color more than 3.0 units (DELTA-E by ASTM D2244) after 120 months outdoor weathering an average of at least two samples.
 - b. The exterior and interior faces shall be tested by recognized laboratory for weathering evaluation per ASTM D4364-84 (EMMAQUA, UNBACKED), after exposure to minimum concentrated natural sunlight radiation of 5600 MJ/M² U.V.(200-385 NM). The exterior and interior faces shall not change.
 - 2.1 Color more than 3.0 units Delta E, 5.0 units Delta L and Delta B
 - 2.2 Yellowing index more than 10 units Delta Y per ASTM D1925.
 - c. The light transmission as measured by ASTM D1003, shall not decrease more than 6% over ten (10) years.
4. Appearance:
 - a. The panels shall be uniform in color, with cellular cross section.
5. Impact Resistance:
 - a. The panels shall provide for the following minimum performance:
 - 1.1. ASTM E-822-81 - Velocity up to 82-ft. per second using ice balls of up to 1.1-in..
 - 1.2. ASTM D-3841/SPI - Impact and Shatter Resistance of 200 ft. lbs.

2.03 FABRICATION

- A. Construct skylight(s) using extruded aluminum members.
- B. Construct skylight(s) using a continuous aluminum curb with expansion joints as required.
- C. Insofar as practicable, fit and assemble work in the manufacturer's shop. Work which cannot be permanently assembled shall be shop-assembled, marked, and disassembled before shipment to the jobsite.
- D. Design rafter bars for slide-in type spline glazing strips.
- E. Design polycarbonate retainer fasteners to resist uplift loadings. Spacing to be determined by structural calculations, when applicable.
- F. Shop locate drill and bolt, or weld aluminum clips to framing members.
- G. Locate weepholes in curb to positively drain condensation to exterior of skylight at each rafter connection.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Upon arrival to the jobsite for installation of the specified work, the manufacturer's erector is to examine the structure and substrate to determine that it is ready to receive the skylight work. Report any faults to the General Contractor prior to proceeding with skylight installation. The skylight manufacturer is not responsible for faulty structure and substrate.

3.02 PREPARATION

- A. Contact between aluminum and dissimilar metals shall receive a protective coating of asphaltic paint for the prevention of electrolytic action and corrosion.
- B. Skylight manufacturer and manufacturer's erector excludes all field measuring, demolition, removal, replacement, or re-work of any existing material.

3.03 INSTALLATION

- A. Install skylight frame, polycarbonate and accessory items as needed in accordance with manufacturer's instructions.
- B. Install skylight system under the direction of the skylight manufacturer's designated erector.
- C. Erect system plumb and true, in proper alignment and relation to established lines and grades as shown on approved shop drawings.
- D. Anchor skylight to structure in strict accordance with approved shop drawings. Apply sealing materials in strict accordance with sealant manufacturer's instructions. Before application remove mortar dirt, dust, moisture and other foreign matter from surfaces it will contact. Mask adjoining surfaces to maintain a clean and neat appearance. Tool sealing compounds to fill the joint and provide a smooth finish.
- E. Furnishing of temporary covering and weatherproofing of the skylight openings, if required by the General Contractor, and removal of the protective measures during and after the skylight installation is excluded by the manufacturer and the manufacturer's erector. ANY TEMPORARY COVERINGS THAT MAY BE REQUIRED ARE NOT TO OBSTRUCT OR INTERFERE WITH THE SKYLIGHT INSTALLATION IN ANYWAY.

3.04 FIELD QUALITY CONTROL

- A. Water Leakage: Field check in accordance with AAMA 501.2 in proportionate areas. There shall be no uncontrolled water leakage as defined in AAMA 501.2. Water supply to the skylights, with adequate water pressure, is to be furnished by the General Contractor. Tests are to be conducted upon completion of the installation with no remobilization or down time included to accommodate either water supply availability or witness personnel schedules. Testing is to be performed by the manufacturer's authorized personnel with a maximum of five (5) man-hours for set-up, testing and clean-up. Independent laboratory testing and reports, if required, are to be ordered and directed by the Owner and/or General Contractor.

3.05 CLEANING

- A. Install skylight frame and associated metal to avoid soiling or smudging the finish.
- B. Clean polycarbonate and frame at time of installation. Final cleaning, if required, subsequent to completion of project, is not to be performed by the manufacturer.

3.06 PROTECTION

- A. The skylight manufacturer does not provide, nor does it include any temporary protection to the skylight and its materials after the installation is complete. Protection of the skylight from ongoing work by other trades shall be the responsibility of the General Contractor. The manufacturer is responsible only for the damage caused by the personnel under its control and responsibility.

END OF SECTION