

PART 1 ~ GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 specification sections, apply to this section.

1.2 SUMMARY

- A. This section includes the following:
1. Aluminum-framed pyramid skylights (thermally broken)
 2. Aluminum-framed double-pitch with hipped ends (thermally broken)
 3. Aluminum-framed flat skylight (thermally broken)
- B. Related sections may include but are not limited to the following:
1. Division 5 Section “Structural Steel” for metal framing.
 2. Division 7 Section “Joint Sealants” for sealants installed at metal-framed skylight perimeters.

1.3 PERFORMANCE REQUIREMENTS

- A. Framing system including glazing material shall be designed to support design loads as prescribed by the governing building code, and/or specified herein:
- i. Negative wind load.....() psf
 - ii. Positive wind load.....() psf
 - iii. Snow load.....() psf
 - iv. Concentrated load.....() lbs.
- B. Thermal load of +/- 60 degrees F from ambient temperature without causing buckling, stresses on glass, failure of seals, undue stress on structural elements, reduction of performance or other detrimental effects.
- C. 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.
- D. The maximum allowable deflection of any framing member normal to the plane of the glass shall not exceed L/175. For spans 20'-0" or greater the maximum allowable deflection shall not exceed L/240.
- E. The maximum allowable deflection of any framing member parallel to the plane of the glass shall not exceed 1/8".
- F. Structural-Test Performance: Metal Framed Skylights tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified deflection limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
 4. Test Pressure: 112.5 PSF positive and 112.5 PSF negative.
- G. Allowable air infiltration shall not exceed 0.08 cfm/sqft. of the total glazed surface area when tested in accordance with ASTM E283 at static pressure of 6.24 psf.
- H. No uncontrolled water leakage shall occur when the system is tested in accordance with ASTM E331 at a static pressure of 15 psf.
- I. Skylights to be limited thrusting in design. Limited thrusting skylight units will control all gravity loads; wind loads will still act upon curbs.

1.4 SYSTEM DESCRIPTION

- A. The following are available in standard size options. Custom sizes available. Please consult factory for custom sizes.
- B. Aluminum-framed pyramid skylights:
 - 1. Size: outside curb dimensions maximum 8'0".
 - 2. Pitch: 7:12
- C. Aluminum-framed hipped end skylights:
 - 1. Size: outside curb dimensions maximum 8'0" wide by (length to be determined by project specific conditions).
 - 2. Pitch: 7:12
- D. Aluminum –framed flat skylights:
 - 1. Size: outside curb dimensions maximum 8'0" wide by (length to be determined by project specific conditions).
 - 2. Pitch: minimum required for water migration (maximum: consult factory per specific project)

1.5 SUBMITTALS

- A. Product Data: includes construction details, material descriptions, dimensions and profiles of components, and finishes for metal-framed skylights.
- B. Shop Drawings: for metal-framed skylights. Includes plans, elevations, sections, details, and attachments to other work.
 - 1. Includes air, water, structural test data, and signed and sealed professional engineering calculations by a qualified professional engineer responsible for their preparation licensed in the state the project is located.
- C. Samples for Initial Selection: manufacturer's color charts showing the full range of colors available for factory-finished aluminum.
- D. Samples for Verification: finish samples, if required, are to be provided on pieces of 2"x3" aluminum sheet
- E. Installer Certificates: if required, signed by manufacturer certifying that installers comply with requirements – reference installer program.
- F. Product Test Reports: from a qualified testing agency indicating skylights comply with requirements, based on comprehensive testing of current products.
- G. Sealant Compatibility and Adhesion Test Reports: from sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with sealants; includes sealant manufacturer's interpretation of test results for sealant performance and recommendations for primers and substrate preparation needed for adhesion.
- H. Field Test Reports: not required

1.6 QUALITY ASSURANCE

- A. Installer qualifications: An experienced installer who has specialized in installing metal-framed skylights similar to those indicated for this project and who is acceptable to manufacturer; also licensed within the state the project is located.
- B. Professional engineer qualifications: A professional engineer who is experienced in providing engineering services of the kind indicated. Engineer must be licensed in the state the project is located.
- C. Testing agency qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. Manufacturer must use an extruded aluminum system comprised of domestically produced aluminum and is fabricated/assembled in the USA.
- E. Manufacturer must have accredited quality assurance program monitored by a third party certified agency.
- F. Pre-construction testing: If required.
- G. Pre-construction sealant compatibility and adhesion testing: If required.
- H. Welding: All welding shall comply with standards set forth by the American Welding Society.
- I. Pre-installation conference: When required, conduct conference at project site to comply with requirements in Division 1, Section “Project Meetings.” Review methods and procedures related to metal-framed skylights including, but not limited to, the following:
 - 1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 - 2. Review structural load limitations.
 - 3. Review skylight curb structural requirements.
 - 4. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
 - 5. Review required testing procedures.
 - 6. Review weather and forecasted weather conditions and procedures for unfavorable conditions.
 - 7. Review protection of adjacent roof areas.
 - 8. Review preparation and other requirements for installing structural silicone sealant.

1.7 PROJECT CONDITIONS

- A. Field measurements: Where skylights are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- B. Established dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating skylights without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 WARRANTY

- A. Skylight manufacturer shall warrant that the framing system will be free of defects in materials and workmanship for a period of ten (10) years from date of substantial completion.

- B. Anodized Finishes: All anodized finishes shall be warranted for color and film integrity for a period of five (5) years from date of application.
- C. Painted finishes: All painted finishes shall be warranted for a period of ten (10) years from date of application.
- D. Glazing materials shall be warranted against defective materials, seal failure, and defects in manufacture per the glazing manufacturer's standard warranties, but not less than five (5) years; only five (5) years delamination warranty is available and breakage is not included.
- E. Skylight manufacturer/installer shall guarantee that the installation will remain weather tight for a period of one (1) year from date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by Acurlite Structural Skylights, Inc. / 1017 N. Vine St. / Berwick, PA 18603 PH: 570-759-6882 FX: 570-759-9552 Email: sales@acurlite.com
- B. Substitutions: Manufacturers shall not be considered without prior approval in writing no later than ten (10) calendar days prior to bid. Substitute manufacturers must have been in the custom skylight business for not less than a period of ten (10) years and must submit to the architect the following:
 - 1. List of similar projects successfully completed within the last five years.
 - 2. Proof of financial capability.
 - 3. Complete details of proposed skylight.
 - 4. Complete specifications for architect's review.
 - 5. Structural calculations for the specific project stamped by a professional engineer licensed in the state in which the project is located.

2.2 FRAMING MATERIALS

- A. Framing Members: extruded aluminum alloy 6063-T5 or T6, ASTM B 221 (ASTM B 221M) with minimum effective thickness of 0.10 inches. Sill member to be extruded with thermal break to isolate interior framing section from exterior framing surfaces.
- B. Exterior Pressure Caps: extruded aluminum alloy 6063-T5 or T6, ASTM B 221 (ASTM B 221M) with minimum effective thickness of 0.10 inches.
- C. Concealed Flashing: manufacturer's standard corrosion-resistant, non-staining, non-bleeding flashing; compatible with adjacent materials.
- D. All formed aluminum flashing and closures to be a minimum of .063 inches in thickness.
- E. Fasteners and Accessories: manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories; compatible with adjacent materials.
 - 1. Aluminum retaining cap fasteners and framing members fasteners: Type as recommended by manufacturer.
 - 2. Connections to supporting structure: zinc plated

- F. Framing-System Sealants: single-component, non-sag, high-performance, non-priming, gun-grade Dow 795 sealant furnished by skylight manufacturer.
1. Sealant complies with ASTM C 920, Type S, Grade NS, Class 50, Use NT, G, A and O. Canadian Specification CAN2-19.13-M82
 2. Color: Dow 795 standard colors

2.3 GLAZING MATERIALS

- A. Skylight system can accommodate 1/4" single glazed – 1-5/16" insulated glazing. Typical insulating glass: 1-3/16 inch consisting of 1/4 inch tinted, tempered exterior lite with soft coat low "e" on # 2 surface, 1/2 inch sealed air space, and 7/16 inch clear laminated safety glass with a .060 interlayer interior lite. (*other as required-specified) *Glass must meet the requirements of AAMA for the project.
- B. Glazing Gaskets:
1. Continuous extruded black E.P.D.M or silicone compatible gasket to meet or exceed the following:
 - i. Hardness (shore A) 60+/- durometer
 - ii. Tensile strength 974 psi or greater
 - iii. Elongation 273%
- C. Spacers, Edge Blocks, and Setting Blocks: manufacturer's standard permanent non-migrating and hardness selected to comply with requirements.
- D. Glazing Weatherseal Sealant: neutral-curing silicone sealant recommended by skylight and sealant manufacturers for this use.
1. Sealant is capable of withstanding 50 percent movement in both extension and compression (total of 100 percent movement) when tested for adhesion and cohesion under maximum cyclic movement according to ASTM C 719.
 2. Sealant complies with ASTM C 920 for Type S, Grade NS, Class 50, uses NT, G, A, and O, as applicable to substrates including other sealants with which it comes in contact.
 3. Color: Dow 795 standard colors
- E. Flashing Sealant: single-component, non-sag, high-performance, non-priming, gun-grade elastomeric polyurethane furnished by skylight manufacturer.
1. Sealant complies with ASTM C920, Type S, Grade NS, Class 50, Use NT, A, G, and O. Canadian Specification CAN2-19.13-M82
 2. Color: Dow 795 standard colors

2.4 FABRICATION

- A. Framing components are as follows:
1. Factory fit and assembled.
 2. All fabrication shall be done at the manufacturing location and not on site.
 3. Install gaskets and tapes at factory.
 4. Fabricate components that, when assembled, will have accurately fitted joints with ends coped; or mitered to produce hairline joints free of burrs and distortion.
 5. Fabricate components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.
 6. Fabricate components to accommodate expansion, contraction, and field adjustment, and to provide for minimum clearance and shimming at skylight perimeter.

7. Fabricate components to ensure that glazing is thermally and physically isolated from framing members;
 8. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
 9. Reinforce members as required to retain fastener threads.
 10. Attach retainer bars with gasketed stainless steel fasteners spaced at a maximum of 8 inches on center.
- B. Prepare framing to receive anchors.
- C. Factory glazing: Locate and size setting blocks and spacers in accordance with the glazing manufacturer's recommendations. At no point shall the glazing come in contact with the skylight frame or fasteners.

2.5 ALUMINUM FINISHES

- A. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
- B. Verify accuracy of components, quantities, and sizes prior to application of finishes.
- C. Applicator - PVDF-Based Finishes:
1. Use regenerative thermal oxidizer to destroy VOC's.
 2. Utilize chrome-based five-stage pretreatment system applied in accordance with AAMA and ASTM standards.
 3. Possess in-house blending capabilities, allowing for only specific amount of paint needed for each project.
 4. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
 5. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
 6. Utilize documented quality control protocol in accordance with AAMA 2605 test procedures.
 - a. Color uniformity: 8.1.1.
 - b. Performance: 8.1.2.
 - c. Specular gloss: 8.2.
 - d. Dry film hardness: 8.3.
 - e. Dry adhesion: 8.4.1.1.
 - f. Wet adhesion: 8.4.1.2.
 - g. Boiling water adhesion: 8.4.1.3.
 - h. Direct impact: 8.5.
 - i. Abrasion resistance: 8.6.
 - j. Muriatic acid resistance: 8.7.1.
 - k. Mortar resistance: 8.7.2.
 - l. Nitric acid resistance: 8.7.3.
 - m. Detergent resistance: 8.7.4.
 - n. 24-hour window cleaner resistance: 8.7.5.
 - o. Online Quality Assurance Inspection:
 - i. Proper paint coverage: 5.0.
 - ii. Visual/appearance: 5.2.
 - iii. Dry-film thickness: 5.3.
 - iv. Color 2ΔE per ASTM D2244, Section 3.
 - v. Gloss: +/- 5 units of manufacturers specification.
 - p. Apply AAMA 2605 compatible water-based air-dry system.
- ii. Applicator - Anodize Finishes:
1. Offer both caustic (traditional) and eco-friendly (acid) etching technologies.
 2. Utilize fully automated, computer-controlled process lines for consistency throughout Project.
 3. Utilize documented quality control protocol in accordance with AAMA 611 test procedures :
 - a. Color uniformity: 8.3.
 - b. Gloss uniformity: 8.4.

- c. Oxide coating thickness: 9.1.
- d. Oxide coating weight/density: 9.2.
- e. Seal test: 9.8.
- f. Online quality assurance inspection:
 - i. Random sample check for color uniformity: Maximum difference of 5ÅE.
 - ii. Random coating thickness testing: Minimum oxide coating of 18 microns (0.7 mil) for Class I clear and color anodize coatings and 10 microns (0.4 mils) for Class II clear anodize.

(customize below per project specific requirements)

- D. *Optional: Class I, color anodic finish: AA-M10C22A42/A44 (mechanical finish, as fabricated; chemical finish: etched, medium matte; anodic coating: Architectural class I, integrally colored or electrolytically deposited color coating 0.7 mil or thicker) complying with AAMA 606.1 or AAMA 608.1.*
- E. *Optional: Anodize Finish: AAMA 611, Architectural Class I anodized to 0.0007 inch minimum thickness, [champagne] [light bronze] [medium bronze] [dark bronze] [extra dark bronze] [black] [copper] [____] color.*
- F. *Optional: PVDF-Based Coating: AAMA 2605, fluoropolymer finish containing minimum 70 percent kynar resins, [two] [three] [four] coat system, [custom] [____] color [to be selected from manufacturer's full color range.*

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting skylight performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection: as follows:
 - 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 or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
 - 3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

3.3 INSTALLATION

- A. General: comply with manufacturer's written instructions for protecting, handling, and installing skylight.
- B. Erection tolerances: Install skylight components true in plane, accurately aligned and without warp or rack.

3.4 CLEANING

- A. Clean skylights inside and outside, immediately after installation and after sealants have cured, according to manufacturer's written recommendations.
 - a. Remove temporary protective coverings and strippable coatings from pre-finished metal surfaces.
Remove labels and markings from all components
- B. Remove excess sealant according to sealant manufacturer's written recommendations.

END OF SECTION 086200