

SOLAR INNOVATIONS.

SECTION 08630 (08 63 00) SKYLIGHT SYSTEMS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Skylight systems; fixed and operable.
 - 1. Accessories.
 - 2. Glass and glazing.
- B. Glass Walkways and Canopies:

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 03 41 16 - Precast Concrete Slabs.
- C. Section 04 22 00 - Concrete Unit Masonry.
- D. Section 05 12 00 – Structural Steel Framing.
- E. Section 05 40 00 - Cold-Formed Metal Framing.
- F. Section 06 10 00 - Rough Carpentry.
- G. Section 06 20 00 - Finish Carpentry.
- H. Section 07 21 19 - Foamed-In-Place Insulation.
- I. Section 07 60 00 - Flashing and Sheet Metal.
- J. Section 07 90 00 - Joint Protection.
- K. Section 08 00 00 – Glazing.

1.3 REFERENCES

- A. American Welding Society (AWS):
 - 1. AWS D1 - Structural Welding Code.
- B. ASTM International (ASTM):
 - 1. ASTM A36/A36M - Standard specification for carbon structural steel.
 - 2. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
 - 3. ASTM B221/B221M - Standard specification for aluminum and aluminum-alloy extruded bars, rods, wires, profiles, and tubes.
 - 4. ASTM B241/B241M - Standard specification for aluminum and aluminum-alloy

- 5. seamless pipe and seamless tubes.
 - 6. ASTM B308 - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
 - 7. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 - 8. ASTM C1115 - Standard specification for dense elastomeric silicone rubber gaskets and accessories.
 - 9. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 10. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - 11. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 12. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
 - 13. ASTM E1886 - Standard test method for performance of exterior windows, curtain walls, doors, and impact protective systems impacted by missiles and exposed to cyclic pressure differentials.
 - 14. ASTM E1996 - Standard specification for performance of exterior windows, curtain walls, doors, and impact protective systems impacted by windborne debris in hurricanes.
- C. Fenestration and Glazing Industry Alliance (FGIA):
- 1. AAMA 611 - Voluntary Specifications for Anodized Architectural Aluminum.
 - 2. AAMA 1503 - Voluntary Test Method For Thermal Transmittance And Condensation Resistance Of Windows, Doors, And Glazed Wall Sections.
- D. Flat glass marketing association, glazing manual (FGMA).
- E. Forest Stewardship Council (FSC).
- F. Glass Association of North America (GANA): Glazing manual.
- G. National Accreditation and Management Institute, Inc. (NAMI).
- H. National Glass Association (NGA).
- I. National Greenhouse Manufacturer's Association (NGMA).
- J. Window and Door Manufacturer's Association (WDMA): AAMA/WDMA/CSA 101/I.S.2/A440 - Windows, Skylights and Glass Doors.
- K. Texas Department of Insurance (TDI): Product Evaluations.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data:
 - 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
- C. Selection Samples: Two complete color chip sets representing manufacturer's full range of stocked colors with a standard size of 2 x 3 inches (50 x 75 mm).

- D. Verification Samples: Two representative units of each type, size, color and finish.
 1. Aluminum Finish: Two samples, minimum size of 2 x 3 inches (50 x 75 mm), representing actual material and color.
 2. Wood Finish: Two samples, minimum size of 2 x 5 inches (50 x 127 mm), representing actual product and color.
 3. Glazing: Two samples, minimum size of 12 x 12 inches (300 x 300 mm), representing specified glass, including coatings and frit patterns.
 4. Assembly Sample: One sample demonstrating connection details with a maximum size of 12 x 12 x 12 inches (305 x 305 x 305 mm). Glazing included as offered by glass supplier. Sample developed to best represent the specified product.
- E. Shop Drawings: Detailed drawings prepared specifically for the project by manufacturer. Include information not fully detailed in manufacturer's standard product data, including, but not limited to wall elevations and detail sections of every typical composite member.
 1. Show opening dimensions, framed opening tolerances, profiles, product components, anchorages, and accessories.
 2. Include details of materials, construction, finish, fastener locations, glazing, hardware arrangements and relationship with adjacent construction.
 3. Include schedule identifying each unit, with marks or numbers referencing Drawings.
 4. Show surrounding substrates and relevant conditions.
- F. Maintenance Manuals: Manufacturer's maintenance manuals.
- G. Warranty: Manufacturer's warranty online registry.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum twenty five (25) years documented experience in fabrication of skylight systems for projects of similar scope.
 1. Use an extruded aluminum system comprised of domestically produced aluminum and is fabricated and assembled in the USA.
 2. Recognized by NAMI.
 3. Member in good standing of the National Greenhouse Manufacturer's Association (NGMA).
 4. Member in good standing of the National Glass Association (NGA).
- B. Installer Qualifications: Company experienced in performing Work of this section that has specialized in installation of work similar in scope and complexity required for this project for a minimum of 5 years.
- C. Source Limitations: Each product type from a single manufacturing source to ensure uniformity.
- D. Mock-Up: Construct a mock-up with actual materials in sufficient time to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
 1. Intent of mock-up is to demonstrate surface preparation techniques, quality of workmanship and visual appearance.
 2. Approximate Size: _____.
 3. Refinish mock-up area as required to produce acceptable work.
 4. Do not continue with remaining work until workmanship, color, and sheen are approved by design team.
 5. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 6. Do not alter or remove mock-up until work is completed or removal is authorized.
 7. Incorporate accepted mock-up as part of the Work.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees to include Architect, Contractor and trades involved. Agenda to include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations. Store products in manufacturer's original unopened packaging, covered to protect factory finishes from damage, precipitation, and construction dirt until ready for installation. Store materials off construction grounds in a secure location that is a dry, covered area and protected from weather conditions.
- B. Inspect and report any freight damages to the manufacturer immediately.
- C. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

- A. Provide manufacturer's standard limited warranty against defects in materials and workmanship.
 - 1. Warranty Period for Skylights: One (1) year for cases of normal use.
 - 2. Warranty for Frame Finish:
 - a. Anodized Finishes: Provide a warranty of Ten (10) years, depending on applicator
 - b. Stock Color AAMA 2605 Finishes: 2 to 3 coats powder or liquid dependent on color and/or application, provide paint manufacturer's warranty for color and film integrity for at least Ten (10) years from date of application.
 - c. Custom Color AAMA 2605 Finishes: 2 to 3 coats powder or liquid dependent on color and/or application, provide paint manufacturer's warranty for color and film integrity for at least Ten (10) years from date of application.
 - d. Custom Warranty Period: ____ years, to be approved and accepted in writing by manufacturer based on project's scope and application.
 - 3. Warranty for Glazing: Manufacturer's standard warranty against defective materials, delamination, seal failure, and defects in manufacturing for up to Ten (10) years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solar Innovations® Architectural Glazing Systems, which is located at: 31 Roberts Rd.; Pine Grove, PA 17963; ASD Toll Free Tel: 800-618-0669; Tel: 570-915-1500; Fax: 800-618-0743; Fax: 570-915-6083; Email: skylight@solarinnovations.com; Web: <http://www.solarinnovations.com>
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 and the following criteria.
 - 1. Structural Calculations: For products specified; stamped by a professional engineer licensed in the state in which the Project is located.

2.2 SKYLIGHT SYSTEMS

A. Performance Requirements

1. Air and Water Leakage Performance:
 - a. Design, fabricate, assemble, and erect the aluminum glazed system to be permanently free of significant air leakage.
 - b. Significant leakage to be defined as a differential test pressure amounting to 20 percent of specified strength performance pressure required with operable windows doors, or joints, if any, sealed to prevent crack leakage.
2. Structural Performance: As tested in accordance with ASTM E330; with no glass breakage or permanent damage to fasteners, anchors, hardware, or actuating mechanisms.
 - a. Normal wall deflection not exceeding 1/175 of clear span for span lengths of 162 inches (4115 mm) or less and 1/240 plus 1/4 inch (6.4 mm) for others. Restrict deflection to 3/4 inch (19 mm) maximum for individual glazing lites.
 - b. Parallel to wall deflection not exceeding 75 percent of glass edge clearance. Restrict deflection to L/360 or 1/8 inch (3 mm) maximum. Restrict deflection to 1/16 inch (1.6 mm) maximum above doors and/or windows. Increasing the deflection to 1/8 inch (3 mm) to be permitted if the door operation is not affected.
3. Thermal Performance: Tested values, certifications, and simulation protocols.
 - a. U-Value: Unit complies with U-value, NFRC rating, or simulation in accordance with NFRC 100 protocol, shown in manufacturer's published data for glazing and sill specified.
 - 1) U-Value: ____.
 - b. Solar Heat Gain Coefficient: Unit to comply with the Solar Heat Gain Coefficient NFRC rated, or simulation in accordance with NFRC 200 protocol, shown in manufacturers published data for the glazing and sill specified.
 - 1) SGHC: ____.
 - c. Visible Light Transmittance: Unit to be simulated for complete system visible light transmittance for the specific system details including glazing and required sill.
 - 1) Visible Light Transmittance: ____.
 - d. Condensation Resistance Factor: Unit to comply with the Condensation Resistance Factor, NFRC rated, or simulation in accordance with NFRC 500 protocol, shown in manufacturers published data for the glazing and sill specified.
 - 1) CRF: ____.
4. Compliance:
 - a. Testing Results for Fixed Skylights: SI5600 Pyramid Skylight System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical unit containing a maximum glass size of (WxH) 46-1/16 x 56-3/16 inches (1170 x 1427 mm). (NCTL 110-15867-1)
 - 1) Air Infiltration Test per ASTM E283:
 - a) Pressure of 1.6 psf (75 Pa): 0.18 cfm per sq ft (0.91 L per sec per sq m) infiltration.
 - b) Pressure of 6.24 psf (300 Pa): 0.24 cfm per sq ft (1.22 L per sec per sq m) infiltration.
 - 2) Water Penetration Test per ASTM E331: Water pressure of 30.0 psf (1436 Pa), 5.0 gal per hour per sq ft (3.4 L per min per sq m) no leakage.
 - 3) Uniform Structural Load Test per ASTM E330:
 - a) Positive Design Pressure: 65 psf.
 - b) Negative Design Pressure: 65 psf.
 - 4) Florida Product Approval & Texas Department of Insurance: Impact FL No. 11259.2.

- b. Testing Results for Fixed Skylights: SI5900 Flat Welded Curb Skylight System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical unit containing a maximum glass size of (WxH) 33-1/4 x 69 inches (845 x 1753 mm). (NCTL 110-15873-1)
 - 1) Air Infiltration Test per ASTM E283:
 - a) Pressure of 1.6 psf (75 Pa): Less than 0.01 cfm min per sq ft (less than 0.05 L per sec per sq m) infiltration.
 - b) Pressure of 6.24 psf (300 Pa): Less than 0.01 cfm min per sq ft (0.05 L per sec per sq m) infiltration.
 - 2) Water Penetration Test per ASTM E331: Water pressure of 30.0 psf (1436 Pa), 5.0 gal per hour per sq ft (3.4 L per min per sq m) no leakage.
 - 3) Design Pressure: Positive or negative 80 psf (3830 Pa).
 - 4) Florida Product Approval & Texas Department of Insurance: Impact FL No. 11259.1.
- c. Testing Results for Operable Skylights: SI6400 Operable System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical unit containing a maximum size of (WxH) 86-5/16 x 66-11/16 inches (2192 x 1693 mm). NCTL 110-18788-1
 - 1) Air Infiltration Test per ASTM E283:
 - a) Pressure of 6.24 psf (300 Pa): Less than 0.01 cfm min per sq ft (0.05 L per sec per sq m) infiltration.
 - 2) Water Penetration Test (ASTM E331 and ASTM E547): Water pressure of 15.0 psf, 5.0 gal per hour per sq ft (3.4 L per sec per sq m) no leakage.
 - 3) Uniform Structural Load Test per ASTM E330:
 - a) Positive Design Pressure: 40 psf (1915 Pa)
 - b) Negative Design Pressure: 40 psf (1915 Pa)

B. Skylight Systems:

- 1. Basis of Design: SI5000 Fixed Skylights as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Configuration: As indicated on Drawings.
 - b. Configuration: Welded curb.
 - c. Configuration: Double pitch.
 - d. Configuration: Single slope.
 - e. Configuration: Pyramid.
 - f. Configuration: Hip end.
 - g. Configuration: Straight eave, double pitch, even span.
 - h. Configuration: Dome.
 - i. Configuration: Walkable.
 - j. Configuration: Barrel vault.
 - k. Configuration: Lean-to.
 - l. Framing Member Materials: As indicated on Drawings.
 - m. Framing Member Materials: Aluminum.
 - n. Muntins: As indicated on Drawings.
 - o. Muntins: Standard muntin.
 - p. Muntins: G2 end wall bar muntin backer.
 - q. Muntins: Boxed muntin.
 - r. Condensation Gutters: As indicated on Drawings.
 - s. Condensation Gutters: 2-1/2 inches (64 mm).
- 2. Basis of Design: SI6400 Operable and Retractable Skylights as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Design: Skylight design determined by final engineering based on force required by skylight assembly, degree of openness, and pitch of installation.
 - b. Configuration: As indicated on Drawings.
 - c. Configuration: 90 degree operation.
 - d. Configuration: Operable ridge vents.

- e. Configuration: Venting.
 - f. Operation Mechanism: As indicated on Drawings.
 - g. Operation Mechanism: Manual.
 - h. Operation Mechanism: Surface-mounted chain actuator.
 - i. Operation Mechanism: Spindle actuator.
 - j. Framing Member Materials: Aluminum.
 - k. Operation Accessories: As indicated on Drawings.
 - l. Operation Accessories:
 - 1) Thermostat.
 - 2) Rain sensor.
 - 3) Wall-mounted control pad.
 - 4) Remote.
 - 5) Wind sensor.
3. Basis of Design: As scheduled and indicated on Drawings.
 4. Local Code Jurisdiction: _____.
 5. Assembly: As indicated on Drawings.
 6. Assembly: Factory assembled, factory glazed.
 7. Assembly: Factory assembled, not factory glazed.
 8. Dimensions: As indicated on Drawings.
 9. Dimensions:
 - a. Width: _____.
 - b. Length: _____.
 - c. Projection: _____.
 - d. Ridge Height: _____.
 10. Roof Pitch: As indicated on Drawings.
 11. Roof Pitch: _____.
 12. Eaves: As indicated on Drawings.
 - a. Eaves Height: As indicated on Drawings.
 13. Eaves: Straight eave.
 - a. Eave Height: As indicated on Drawings.
 - b. Eave Height: _____.
 14. Eaves: Curved eave.
 - a. Eave Height: As indicated on Drawings.
 - b. Eave Height: _____.
 15. Framing System: As indicated on Drawings.
 16. Framing System: SI5206 LD System as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Size: As indicated on Drawings.
 - b. Size: 2 x 2 inches (50 x 50 mm), not including glazing depth.
 - c. Size: 2 x 2-13/16 inches (50 x 71 mm), not including glazing depth.
 - d. Size: 2 x 4 inches (50 x 102 mm), not including glazing depth.
 - e. Size: 2 x 5-1/2 inches (50 x 140 mm), not including glazing depth.
 - f. Size: 2 x 8 inches (50 x 203 mm), not including glazing depth.
 17. Framing System: SI5256 HDSystem as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Size: As indicated on Drawings.
 - b. Size: 2-1/2 x 4 inches (64 x 102 mm), not including glazing depth.
 - c. Size: 2-1/2 x 6 inches (64 x 152 mm), not including glazing depth.
 - d. Size: 2-1/2 x 8 inches (64 x 203 mm), not including glazing depth.
 - e. Size: 2-1/2 x 9-3/4 inches (64 x 248 mm), not including glazing depth.
 18. Framing System: SI5202 LD System as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Size: As indicated on Drawings.
 - b. Size: 2 x 2 inches (50 x 50 mm), not including glazing depth.
 - c. Size: 2 x 2-13/16 inches (50 x 71 mm), not including glazing depth.
 - d. Size: 2 x 4 inches (50 x 102 mm), not including glazing depth.

- e. Size: 2 x 5-1/2 inches (50 x 140 mm), not including glazing depth.
- f. Size: 2 x 8 inches (50 x 203 mm), not including glazing depth.
- 19. Framing System: SI5252 HD System as manufactured by Solar Innovations Architectural Glazing Systems.
 - a. Size: As indicated on Drawings.
 - b. Size: 2-1/2 x 4 inches (64 x 102 mm), not including glazing depth.
 - c. Size: 2-1/2 x 6 inches (64 x 152 mm), not including glazing depth.
 - d. Size: 2-1/2 x 8 inches (64 x 203 mm), not including glazing depth.
 - e. Size: 2-1/2 x 9-3/4 inches (64 x 248 mm), not including glazing depth.
- 20. Framing Member Cross Section: As required to accomplish performance criteria.
- 21. Framing Member Cross Section: _____.
- 22. Bay Centers: As indicated on Drawings.
- 23. Bay Centers: 30.5 inches (774 mm).
- 24. Bay Centers: 38 inches (965 mm).
- 25. Bay Centers: Custom, _____.
- 26. Basic Mullion and Purlin Design: As indicated on Drawings.
- 27. Basic Mullion and Purlin Design: Uniform bay widths; dimension as recommended by manufacturer.
- 28. Screens:
 - a. Type: As indicated on Drawings.
 - b. Type: SI1000 Fixed screens as manufactured by Solar Innovations Architectural Glazing Systems.
 - c. Type: SI1000 Operable screens as manufactured by Solar Innovations Architectural Glazing Systems.
 - 1) Manual operation.
 - 2) Motorized operation.
 - d. Framing: Aluminum, 1 x 1 inch (25 x 25 mm).
 - e. Screen Materials: As indicated on the Drawings.
 - f. Screen Materials: Standard gray colored charcoal.
 - g. Screen Materials: Fiberglass.
 - h. Screen Materials: Aluminum.
 - i. Screen Materials: Black Tuffscreen mesh.
 - j. Size: As indicated on the Drawings.
 - k. Size: _____.
 - l. Mounting and Configuration: As indicated on Drawings.
- 29. Skylight Accessories: As indicated on Drawings.
- 30. Skylight Accessories:
 - a. Ridge vents, with thermal break.
 - b. Eave vents, with thermal break.
 - c. Appliques.
 - d. Corners.
 - e. Corner posts.
 - f. Ridge crests.
 - g. Moldings.
 - h. Decorative crowns.
 - i. Decorative gutters.
 - j. Trim.
 - k. Grids.
 - l. Finials.
 - m. Transoms.
 - n. Windows; fixed/operable.

C. Materials:

- 1. Aluminum Flashing and Closures:
 - a. Alloy and Temper: As indicated on Drawings.
 - b. Alloy and Temper: 6063-T1.

- c. Alloy and Temper: 6063-T4.
 - d. Alloy and Temper: 6063-T5.
 - e. Alloy and Temper: 6063-T6.
 - f. Alloy and Temper: 6061-T6.
 - g. Sheet Aluminum Finish: Matching system components.
 - h. Thickness: Minimum 0.040 inch (1 mm) thick.
 - i. Attachment: Secured with concealed fastening method or fastener with head finished to match system components.
 - j. Snap-on Covers and Miscellaneous Non-Structural Trim: Minimum thickness as recommended by manufacturer.
2. Insulation: Expanded polystyrene insulation at filler panels and sheet metal members.
 3. Internal Reinforcing, Standards Compliance:
 - a. Structural Aluminum Compliance: ASTM B308.
 - b. Carbon Steel Compliance: ASTM A36.
 - c. Carbon Steel Finish: Factory primed steel, manufacturer recommended primer.
 4. Perimeter Sealant: As indicated on Drawings.
 5. Perimeter Sealant: Manufacturer's standard, color to match framing finish.
 6. Perimeter Sealant: Manufacturer's standard, color as selected from manufacturer's standard range.
 7. Glazing: As indicated on Drawings.
 8. Glazing: Single pane, polycarbonate.
 9. Glazing: Custom, single pane, _____.
 10. Glazing: Custom insulated.
 11. Glazing: Custom polycarbonate, 25 mm or thicker.
 12. Glazing: Custom heat-strengthened laminated.
 13. Glazing: Double pane glazing, 1 inch (25 mm) insulated glass unit.
 - a. Exterior Glazing Lites: As indicated on Drawings.
 - b. Outboard Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 272 low-emissivity coating on surface two.
 - 1) Visible Light Transmittance: 72 percent.
 - 2) Solar Heat Gain Coefficient: 0.41.
 - c. Exterior Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 366 low-emissivity coating on surface two.
 - 1) Visible Light Transmittance: 65 percent.
 - 2) Solar Heat Gain Coefficient: 0.27.
 - d. Exterior Glazing Lites: 3/16 inch (5 mm) tempered clear glass with LoE 340 low-emissivity coating on surface two.
 - 1) Visible Light Transmittance: 39 percent.
 - 2) Solar Heat Gain Coefficient: 0.18.
 - e. Vertical Interior Glazing Lites: 3/16 inch (5 mm) tempered clear glass.
 - f. Sloped Interior Glazing Lites: 5/16 inch (8 mm) annealed clear laminated glass with an .060 PVB interlayer.
 - g. Air spacer: Stainless steel spacer with dual seals of polyisobutylene/silicone and filled with argon gas.
 14. Glazing: Specialty glazing, electrochromic glass; can be controlled through a building automation system or manually; shading, glare, and HVAC can be controlled.
 15. Glazing: Specialty glazing, thermochromic.
 16. Glazing: Specialty glazing, Solera Glass light diffusion glazing system.
 17. Glazing: Specialty glazing, Lumira Polycarbonate filled polycarbonate panels.
 18. Glazing: Decorative, _____.
 19. Glazing: Decorative, Pattern 62.
 20. Glazing: Decorative, single glue chip.
 21. Glazing: Decorative, glue chip.
 22. Glazing: Decorative, English reeded.
 23. Glazing: Decorative, satin/acid etch.
 24. Glazing Gaskets: Compatible with glazing sealant.

- a. Compliance: ASTM C864.
 - b. Design Compression type, replaceable, EPDM gaskets; with solid strand cord to prevent shrinkage.
 - c. Color: Manufacturer's standard, black.
25. Setting Blocks, Edge Blocks, and Spacers: As recommended by manufacturer and compatible with insulated glass.
26. Fasteners: Aluminum and stainless steel, not causing electrolytic action or corrosion.
- a. Fasteners that are Zinc Cadmium-plated are acceptable in locations as approved by manufacturer.
27. Finish for Exposed Fasteners: To match finish of aluminum frame.

D. Finishes:

- 1. Aluminum Skylight Frames: As scheduled and indicated on Drawings.
- 2. Aluminum Skylight Frames: Dual color, as indicated on Drawings.
- 3. Aluminum Skylight Frames: Dual finish, as indicated on Drawings.
- 4. Aluminum Skylight Frames: Mill finish, unfinished.
- 5. Aluminum Skylight Frames: Manufacturer's standard clear anodized finish, Class I AAMA 611.
- 6. Aluminum Skylight Frames: Manufacturer's standard dark bronze anodized, Class 1 AAMA 611.
- 7. Aluminum Skylight Frames: 304 stainless steel cladding with No. 4 satin finish.
- 8. Aluminum Skylight Frames: 304 stainless steel cladding with No. 8 mirror finish.
- 9. Aluminum Skylight Frames: Powder coating solids finish, bone white, AAMA 2605.
- 10. Aluminum Skylight Frames: Powder coating solids finish, fashion gray, AAMA 2605.
- 11. Aluminum Skylight Frames: Powder coating solids finish, colonial gray, AAMA 2605.
- 12. Aluminum Skylight Frames: Powder coating solids finish, military light blue, AAMA 2605.
- 13. Aluminum Skylight Frames: Powder coating solids finish, burgundy, AAMA 2605.
- 14. Aluminum Skylight Frames: Powder coating solids finish, charcoal, AAMA 2605.
- 15. Aluminum Skylight Frames: Powder coating metallics finish, champagne, AAMA 2605.
- 16. Aluminum Skylight Frames: Powder coating metallics finish, cosmic gray, AAMA 2605.
- 17. Aluminum Skylight Frames: Powder coating metallics finish, light bronze, AAMA 2605.
- 18. Aluminum Skylight Frames: Powder coating metallics finish, copper, AAMA 2605.
- 19. Aluminum Screen Frames: Finish as indicated on Drawings.
- 20. Aluminum Screen Frames: _____.
- 21. Aluminum Screen Frames: Finish to match frames.

E. Fabrication:

- 1. Fabricate components in accordance with approved Shop Drawings.
- 2. Major fabrication must done at the manufacturing location.
- 3. Install gaskets and tapes at factory.
- 4. Disassemble only to the extent necessary for shipping and handling limitations.
- 5. Manufacturer is to be notified of any field modification prior to the activity commencing.
- 6. Welding is to comply with standards set forth by the American Welding Society.
- 7. Factory-grind exposed welds smooth and flush with adjacent surfaces prior to finish application; restore mechanical finish.
- 8. Isolation membrane materials to be used to separate dissimilar metals to prevent galvanic corrosion/action between materials.
- 9. Fabricate components to allow for accurate and rigid fit of joints and corners. Match components carefully ensuring continuity of line and design. Ensure joints and connections will be flush and weather tight. Ensure slip joints make full, tight contact and are weathertight.
- 10. Steel Components:

- a. Clean surfaces after fabrication and immediately prior to application of primer in accord with manufacturer's recommendations.
- b. Apply specified shop coat primer in accordance with manufacturer's instructions to provide 1.0 mil (0.05 mm) minimum dry film thickness.
- 11. Fabricate components true to detail and free from defects impairing appearance, strength or durability.
- 12. Provide contoured exterior horizontal or purlin glazing retainers to minimize water, ice, and snow buildup.
- 13. Fabricate with removable sill and head stop.
- 14. Reinforce components at anchorage and support points, joints, and attachment points for interfacing work.
- 15. Accurately size glazing to fit openings allowing for clearances as set forth by the "Glazing Manual" published by the Glass Association of North America (GANA).
- 16. Cut glass clean and carefully. Nicks and damaged edges will not be accepted. Replace glass with damaged edges.

2.3 GLASS WALKWAYS AND CANOPIES

A. Performance Requirements:

- 1. Air and Water Leakage Performance:
 - a. Design, fabricate, assemble, and erect the aluminum glazed system to be permanently free of significant air leakage.
 - b. Significant leakage to be defined as a differential test pressure amounting to 20 percent of specified strength performance pressure required with operable windows doors, or joints, if any, sealed to prevent crack leakage.
- 2. Structural Performance: As tested in accordance with ASTM E330; with no glass breakage or permanent damage to fasteners, anchors, hardware, or actuating mechanisms.
 - a. Normal wall deflection not exceeding 1/175 of clear span for span lengths of 162 inches (4115 mm) or less and 1/240 plus 1/4 inch (6.4 mm) for others. Restrict deflection to 3/4 inch (19 mm) maximum for individual glazing lites.
 - b. Parallel to wall deflection not exceeding 75 percent of glass edge clearance. Restrict deflection to L/360 or 1/8 inch (3 mm) maximum. Restrict deflection to 1/16 inch (1.6 mm) maximum above doors and/or windows. Increasing the deflection to 1/8 inch (3 mm) to be permitted if the door operation is not affected.
- 3. Thermal Performance: Tested values, certifications, and simulation protocols.
 - a. U-Value: Unit complies with U-value, NFRC rating, or simulation in accordance with NFRC 100 protocol, shown in manufacturer's published data for glazing and sill specified.
 - 1) U-Value: ____.
 - b. Solar Heat Gain Coefficient: Unit to comply with the Solar Heat Gain Coefficient NFRC rated, or simulation in accordance with NFRC 200 protocol, shown in manufacturers published data for the glazing and sill specified.
 - 1) SGHC: ____.
 - c. Visible Light Transmittance: Unit to be simulated for complete system visible light transmittance for the specific system details including glazing and required sill.
 - 1) Visible Light Transmittance: ____.
 - d. Condensation Resistance Factor: Unit to comply with the Condensation Resistance Factor, NFRC rated, or simulation in accordance with NFRC 500 protocol, shown in manufacturers published data for the glazing and sill specified.
 - 1) CRF: ____.
- 4. Compliance:
 - a. Testing Results for Fixed Skylights: SI5600 Pyramid Skylight System as

manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical unit containing a maximum glass size of (WxH) 46-1/16 x 56-3/16 inches (1170 x 1427 mm). (NCTL 110-15867-1)

- 1) Air Infiltration Test per ASTM E283:
 - a) Pressure of 1.6 psf (75 Pa): 0.18 cfm per sq ft (0.91 L per sec per sq m) infiltration.
 - b) Pressure of 6.24 psf (300 Pa): 0.24 cfm per sq ft (1.22 L per sec per sq m) infiltration.
 - 2) Water Penetration Test per ASTM E331: Water pressure of 30.0 psf (1436 Pa), 5.0 gal per hour per sq ft (3.4 L per min per sq m) no leakage.
 - 3) Uniform Structural Load Test per ASTM E330:
 - a) Positive Design Pressure: 65 psf.
 - b) Negative Design Pressure: 65 psf.
 - 4) Florida Product Approval: Impact FL No. 11259.2.
- b. Testing Results for Fixed Skylights: SI5900 Flat Welded Curb Skylight System as manufactured by Solar Innovations Architectural Glazing Systems; when tested on a typical unit containing a maximum glass size of (WxH) 33-1/4 x 69 inches (845 x 1753 mm). (NCTL 110-15873-1).
- 1) Air Infiltration Test per ASTM E283:
 - a) Pressure of 1.6 psf (75 Pa): Less than 0.01 cfm min per sq ft (less than 0.05 L per sec per sq m) infiltration.
 - b) Pressure of 6.24 psf (300 Pa): Less than 0.01 cfm min per sq ft (0.05 L per sec per sq m) infiltration.
 - 2) Water Penetration Test per ASTM E331: Water pressure of 30.0 psf (1436 Pa), 5.0 gal per hour per sq ft (3.4 L per min per sq m) no leakage.
 - 3) Design Pressure: Positive or negative 80 psf (3830 Pa).
 - 4) Florida Product Approval: Impact FL No. 11259.1.

B. Dimensions: for SI5001-Series Walkways and Canopies:

1. Width: _____.
2. Length: _____.
3. Projection: _____.
4. Ridge Height: _____.
5. As indicated on the Drawings
6. Roof Pitch: _____.
7. Eave Height: _____.

C. Configuration:

1. Straight Eave.
2. Curved Eave.
3. Double pitch / even span.
4. Lean-to.
5. Single slope.

D. Glazing:

1. Single Pane Float Glass: 3/16 inch (5 mm).
2. Single Pane Float Glass: 1/4 inch (7 mm).
3. Single Pane: Polycarbonate.
4. Single Pane: _____.
5. Double Pane: 1 inch (25 mm) insulated glass unit.
 - a. Exterior Glazing Lite: 3/16 inch (5 mm) tempered clear glass. LoE 272 low-emissivity coating on surface two.
 - b. Stainless Steel Air Spacer: Dual seals of polyisobutylene/silicone.
 - c. Air Space: To be filled with argon gas.
 - d. Vertical Interior Glazing Lite: 3/16 inch (5 mm) tempered clear glass.
 - e. Sloped Interior Glazing Lite: 5/16 inch (8 mm) annealed clear laminated glass

- with an 0.060 PVB interlayer.
 - 6. Specialty Glazing Options:
 - a. Electrochromic Glass: Glazing system controlled by a building automation system, greenhouse automation system, or manually.
 - 1) Shading, glare, and HVAC can all be controlled.
 - b. Thermochromic Glass: Glazing system 'tinted' via natural heat.
 - c. Solera Glass: A light diffusion glazing system.
 - d. Lumira Polycarbonate: Filled polycarbonate panels to control light diffusion and insulation characteristics.
 - 7. Glazing Accessories
 - a. Decorative mullions.
 - b. Interior Grids: 3/16 x 5/8 inch (5 x 16 mm).
 - c. Simulated Divided Lites: 3/8 x 5/8 inch (9.5 x 16 mm).
 - d. Applied Grid: 3/4 inch (19 mm) traditional.
 - e. Applied Grid: 1-1/4 inch (32 mm) traditional.
 - f. Applied Grid: 7/8 inch (22 mm) colonial.
 - g. Applied Grid: 7/8 inch (22 mm) ogee.
 - h. Applied Grid: 3/4 inch (19 mm) low profile.
 - i. Decorative raised panels.
- E. Framing Members:
1. Aluminum SI5200FGS - LD Residential System:
 - a. Size: 2 by 1/2 inch (50 by 13 mm), not including glazing depth.
 - b. Cross Section: As required to accomplish performance criteria.
 - c. Cross Section: _____.
 2. Aluminum SI5202 - LD Residential System:
 - a. Size: 2 by 2 inch (50 by 50 mm), not including glazing depth.
 - b. Size: 2 by 2-13/16 inch (50 by 71 mm), not including glazing depth.
 - c. Size: 2 x 4 inches (50 x 102 mm), not including glazing depth.
 - d. Size: 2 by 5-1/2 inch (50 by 140 mm), not including glazing depth.
 - e. Size: 2 by 8 inch (50 by 203 mm), not including glazing depth.
 - f. Cross Section: As required to accomplish performance criteria.
 - g. Cross Section: _____.
 3. Aluminum SI5252 - HD Residential System:
 - a. Size: 2-1/2 by 4 inch (64 by 102 mm), not including glazing depth.
 - b. Size: 2-1/2 by 6 inch (64 by 152 mm), not including glazing depth.
 - c. Size: 2-1/2 by 8 inch (64 by 203 mm), not including glazing depth.
 - d. Size: 2-1/2 x 9-3/4 inches (64 x 248 mm), not including glazing depth.
 - e. Cross Section: As required to accomplish performance criteria.
 - f. Cross Section: _____.
 4. Bay Centers: 30.5 inch (775 mm).
 5. Bay Centers: 38 inch (965 mm).
 6. Bay Centers: 46.5 inch (1181 mm).
 7. Custom Bay Centers: _____
- F. Accessories: All operable accessories must include a thermal break.
1. Ridge Vents; thermally broken.
 2. Eave Vents; thermally broken.
 3. Appliques.
 4. Corners.
 5. Corner Posts.
 6. Ridge Crests.
 7. Moldings.
 8. Decorative Crown.
 9. Decorative Gutter.
 10. Trims.

11. Grids.
 12. Finials.
 13. Transom Band.
 14. Mullion and Purlin Design: Uniform bay widths; dimension as recommended by manufacturer.
 15. Mullion and Purlin Design: As indicated on the Drawings.
- G. Local Code Jurisdiction: _____.
- H. Materials:
1. Aluminum: 6063-T5, 6063-T6, or 6061-T6 alloy and temper.
 - a. Other alloys and tempers may be used for non-structural members provided they do not void the required warranties.
 - b. Indicate alloys and tempers clearly on shop drawings and in structural calculations.
 - c. Framing Members: Thickness based on design loading, cross sectional configuration, and fabrication requirement.
 - d. Aluminum Flashing and Closures: Minimum of 0.040 inch (1 mm) thick.
 - e. Snap-on Covers and Miscellaneous Non-Structural Trim: Minimum thickness recommended by the manufacturer.
 2. Insulated Panels: Expanded polystyrene; at filler panels and sheet metal members.
 3. Glazing: See product section.
 4. Glazing Gaskets: Compression type design, replaceable, EPDM, complying with ASTM C 864, with solid strand cord to prevent shrinkage.
 - a. Completely compatible with glazing sealant.
 - b. Profile and hardness as necessary to maintain uniform pressure for watertight seal.
 - c. Color: Black.
 5. Flashings: Sheet aluminum; same finish as system components. Secured with concealed fastening method or fastener with head finished to match.
 - a. Thickness: As required for conditions encountered.
 6. Internal Reinforcing:
 - a. Carbon Steel: ASTM A36/A36M.
 - b. Structural Aluminum: ASTM B308/B308M.
 - c. Shapes and Sizes: To suit installation.
 - d. Shop coat steel components after fabrication with manufacturer recommended primer.
 7. Setting Blocks, Edge Blocks, and Spacers: As required by manufacturer and compatible with insulated glass where required.
 8. Structural Glazing Sealant: Manufacturer's standard. Color: Black.
 9. Perimeter Sealant: Manufacturer's standard color to match framing finish if available; otherwise color as selected from manufacturer's standard range.
 10. Anchors and Fasteners:
 - a. Aluminum and Stainless Steel of type which will not cause electrolytic action or corrosion.
 - b. Zinc cadmium-plated fasteners may be used if acceptable to manufacturer.
 - c. Finish exposed fasteners to match aluminum frame.
 11. Accessories: Provide as schedule to achieve design intent and environmental control.
- I. Finishes: Aluminum.
1. Mill finish.
 2. Anodized Complying with AAMA 611:
 - a. Color: Clear; class 1.
 - b. Color: Dark bronze.
 3. AAMA 2605 Finish:
 - a. Color: Manufacturer's standard bronze.

- b. Color: Manufacturer's standard Hartford green.
 - c. Color: Manufacturer's standard white.
 - d. Color: Manufacturer's standard sandstone.
 - e. Color: Manufacturer's standard black.
 - f. Color: Manufacturer's standard natural clay.
- 4. Aluminum Liquid Finish: _____
 - 5. Aluminum Powder Finish: _____
 - 6. Aluminum Anodized Finish: _____
 - 7. Metal Cladding: _____

J. Fabrication:

- 1. Fabricate components in accordance with shop drawings approved by the architect.
- 2. Perform all work in a method that will meet or exceed industry standards.
- 3. All Major Fabrications: Done at manufacturing location and not onsite.
- 4. Manufacturer must remove burrs and rough edges prior to finish application.
- 5. Install gaskets and tapes at factory, as reasonable.
- 6. Disassemble only to extent necessary for shipping and handling limitations.
- 7. Field Modifications: Notify manufacturer prior to commencing activity.
- 8. Welding: Comply with standards set forth by the American Welding Society.
- 9. Exposed Welds: Grind smooth and flush with adjacent surfaces before finishing; restore mechanical finish.
- 10. Isolation Membrane Materials: Use to separate dissimilar metals to prevent galvanic corrosion/action between materials.
- 11. Component Fabrication:
 - a. Fabricate true to detail and free from defects impairing appearance, strength or durability.
 - b. Allow for accurate and rigid fit of joints and corners.
 - c. Match components carefully ensuring continuity of line and design.
 - d. Ensure joints and connections will be flush and weather tight.
 - e. Ensure slip joints make full, tight contact and are weather tight.
- 12. Steel Components: Primer application.
 - a. Clean surfaces after fabrication and immediately prior to application of primer in accord with manufacturer's recommendations.
 - b. Apply specified shop coat primer per manufacturer's instructions to provide 1.0 mil (0.05 mm) minimum dry film thickness.
- 13. Glazing Retainers: Contoured exterior horizontal or purlin retainers to minimize water, ice, and snow buildup.
- 14. Reinforce components at anchorage and support points, joints, and attachment points for interfacing work.
- 15. Accurately size glazing to fit openings allowing for clearances as set forth by the "Glazing Manual" published by the Flat Glass Marketing Association (FGMA).
- 16. Cut glass clean and carefully.
 - a. Nicks and damaged edges will not be accepted.
 - b. Replace all glass with damaged edges.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare substrates in strict accordance with the approved Shop Drawings, using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Thoroughly clean surfaces and substrates prior to installation.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
 - 1. Separate dissimilar materials using nonconductive tape, paint, or other material not visible in finished work.
 - 2. Provide attachments and shims to permanently fasten system to building structure.
 - 3. Maintain dimensional tolerances and alignment with adjacent work.
 - 4. Anchor securely in place, allowing for required movement, including but limited to expansion and contraction.
 - 5. Install glazing sealants in accordance with manufacturer's instructions, including but not limited to surface preparations.
 - 6. Set sill members in bed of sealant. Set other members with internal sealants to provide weather tight construction.
 - 7. Install flashings, bent metal closures, corners, gutters, and other accessories as detailed on Shop Drawings and required for complete installation.
 - 8. Clean surfaces and install sealant in accordance with sealant manufacturer's instructions and guidelines.

3.3 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection with appropriate sections in Division 01.
- B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.4 TESTING AND ADJUSTING

- A. Adjust hinge set, locksets, and other hardware for proper operation.
- B. Lubricate using a manufacturer approved lubricant compatible with frame coatings.

3.5 CLEANING AND PROTECTION

- A. Clean and protect products in accordance with the manufacturer's recommendations.
 - 1. Remove temporary coverings and protection of adjacent work areas.
 - 2. Clean and dress sealant prior to installation completion.
 - 3. Clean glass prior to installation completion.
 - 4. Clean entire enclosure one time at completion of installation. Cleaning includes surface cleaning of aluminum framing and glass and cleanup of construction debris.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
 - 1. Areas with Abraded Surface Finish: Clean and touch-up with air dry paint, as approved and furnished by window manufacturer, color to match factory applied finish.

END OF SECTION