



SECTION 08625

TUBULAR DAYLIGHTING SYSTEM

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**** NOTE TO SPECIFIER ** Solatube International, Inc.; residential and commercial tubular daylighting systems.**

**This section is based on the products of Solatube International, Inc., which is located at:
2210 Oak Ridge Way
Vista, CA 92081
Toll Free Tel: 888-765-2882
Tel: 760-477-1120
Fax: 760-597-4488
Email: [request info](mailto:request@solatube.com)
Web: www.solatube.com
[[Click Here](#)] for additional information.**

Solatube Daylighting Systems (DS) use advanced optics to significantly improve the way daylight is harnessed. Solatube International has added breakthrough technology throughout the system to capture more sunlight on the roof, transfer more sunlight through the tubing and effectively diffuse the light in the building interior. Solatube Daylighting Systems set performance standards never seen before. Highly effective and simple to install, these models can transform dark interior rooms and light more expansive spaces when used in multiples, creating a unique architectural effect.

Solatube Daylighting Systems can accommodate virtually any ceiling configuration including suspended ceilings, finished drywall ceilings, and open ceilings making them appropriate for a wide variety of commercial and residential applications, including office, retail, warehouse, industrial, education, healthcare facilities, multifamily housing, and custom homes. These Daylighting Systems provide significant energy savings, improved environments, and high-quality lighting.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tubular daylighting system, consisting of roof dome, reflective tube, and diffuser assembly; configuration as indicated on the drawings.

**** NOTE TO SPECIFIER ** Delete the following paragraph if no daylight dimmers, security bars, light fixtures or ventilation accessories are specified.**

- B. Accessories.

1.2 RELATED SECTIONS

**** NOTE TO SPECIFIER ** Delete any sections below not relevant to this project; add others as required.**

- A. Section 07311 - Asphalt Shingles: Flashing of skylight base.
- B. Section 07320 - Roof Tiles: Flashing of skylight base.
- C. Section 07510 - Built-Up Bituminous Roofing: Flashing of skylight base.
- D. Section 07530 - Electrometric Membrane Roofing: Flashing of skylight base.
- E. Section 07550 - Modified Bituminous Membrane Roofing: Flashing of skylight base.
- F. Section 07600 - Flashing: Metal flashings.
- G. Section 08620 - Unit Skylights: Skylights without reflective tube.
- H. Section 08630 - Metal Framed Skylights.
- I. Section 15810 - Ducts: Fan vent duct and connections.
- J. Section 16150 - Equipment Wiring: Electrical connections.
- K. Section 16500 - Lighting Equipment and Controls: Light bulbs and lamps.

1.3 REFERENCES

**** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section.**

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.
- B. ASTM A 463/A 463M - Standard Specification for Steel Sheet, Aluminum Coated, by the Hot Dip Process; 2001a.
- C. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized), by the Hot Dip Process; 2001a.
- D. ASTM E 283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- E. ASTM E 308-95 - Standard Practice for Computing the Colors of Objects by Using the CIE System
- F. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors.
- G. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain walls and Doors by Static Air Pressure Difference.
- H. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- I. ASTM D-1929 - Test Method for Ignition Properties of Plastics.
- J. UL 181 - Factory Made Air Ducts and Air Connectors; 1998
- K. UL 790 - Standard for Tests for Fire Resistance of Roof Covering Materials; 1997.
- L. ICBO/ICC AC-16 - Acceptance Criteria for Plastic Skylights; 2003.

1.4 PERFORMANCE REQUIREMENTS

- A. Completed tubular daylighting system assemblies shall be capable of meeting the following performance requirements:
1. Air Infiltration Test: Air infiltration will not exceed .30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
 2. Water Resistance Test: No uncontrolled water leakage at 16.5 psf pressure differential with water rate of 5 gallons/hours/sf when tested in accordance with ASTM E 331.
 3. Uniform Load Test:

**** NOTE TO SPECIFIER ** Select the following Paragraph for use with Solatube Model 21-O or 21-C. Delete if not applicable.**

- a. No breakage, permanent damage to fasteners, hardware parts, or damage to make tubular skylight inoperable or cause permanent deflection of any section in excess of 1 percent of its span at a Positive or Negative Load of 35 psf (1.68 kPa).
 - b. All units shall be tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.
4. Fire Testing:
- a. Class B Burning Brand - The burning brand shall self-extinguish without transferring the fire to the dome Per: U.B.C. Standard 15-2 Class B Burning Brand Test. See ASTM E 108 and UL 790.
 - b. Self-Ignition Temperature - Greater than 650 degrees F Per: U.B.C. Standard 26-6. See ASTM D-1929-68 (1975).
 - c. Smoke Density - Rating no greater than 75 Per: U.B.C. Standard 26-5. (See ASTM D-2843-70) or no greater than 450 Per U.B.C. 8-1 (See ASTM Standard E 84-91A) in way intended for use.
 - d. Rate of Burn - Minimum Burning Rate: 2.5 inches/min (64 mm/min) Classification CC-2: U.B.C. Standard 26-7. See ASTM D 635-74.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings. Submit shop drawings showing layout, profiles and product components, including anchorage, flashings and accessories.
- D. Verification Samples: As requested by Architect.
- E. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.

**** NOTE TO SPECIFIER ** Delete the following paragraphs if LEED is not applicable. Several opportunities exist for LEED credits when using daylighting systems specified. Contact Solatube International, Inc. for additional information.**

- F. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of Daylight Credits available for the products specified.

2. Data on Energy Optimization Performance Credits for the products specified.
3. Data on Regional Credits which may be available for the project location.
4. Data on Perimeter and Non-Perimeter Controllability of Systems for use of Daylight Dimmer option with the products specified.
5. Data on potential Innovation in Design Credits which may be available for the innovative use of the products specified.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engaged in manufacture of tubular skylights for minimum 10 years.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

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 absolute limits.

1.9 WARRANTY

- A. Tubular Daylighting System: Manufacturer's standard warranty for 10 years.

**** NOTE TO SPECIFIER ** Delete if optional electric components are not required.**

- B. Electrical Parts: Manufacturer's standard warranty for 5 years, unless otherwise indicated.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solatube International, Inc., which is located at: 2210 Oak Ridge Way ; Vista, CA 92081; Toll Free Tel: 888-765-2882; Tel: 760-477-1120; Fax: 760-597-4488 ; Email: request info; Web: www.solatube.com

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 TUBULAR DAYLIGHTING SYSTEM

- A. Tubular Daylighting System General : Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICBO/ICC AC-16.
- B. SolaMaster Series: Solatube Model 21-C Penetrating Ceiling, 21 inch (530 mm) Daylighting System:

1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.

**** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required. Acrylic is standard and polycarbonate is optional. CC1 Polycarbonate Domes meet Dade County Florida's requirements. Use ONLY CC1 Polycarbonate Domes in high velocity wind zones.**

- a. Glazing: Type DA, 0.143 inch (3.7 mm) minimum thickness injection molded acrylic classified as CC2 material and meeting characteristics of DR-101 blend.
- b. Glazing: Type DP, 0.125 inch (3.2 mm) minimum thickness polycarbonate classified as CC1 material.
2. LightTracker Reflector, made of aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in the dome to capture low angle sunlight.
3. Roof Flashing Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
 - a. Base Material: Sheet steel, corrosion resistant conforming to ASTM A 653/A 653M or ASTM A 463/A 463M, 0.028 inch (0.7 mm) thick.

**** NOTE TO SPECIFIER ** Select one or more of the following flashing paragraphs and delete those not required. 8 inch or 11 inch bases are recommended for flat commercial roofs. Curb mounted base is normally used only on metal roofs or other roofs where curb is preferred.**

- b. Base Style: Type F04, Self mounted, 4 inches (102 mm) high.
- c. Base Style: Type F08, Self mounted, 8 inches (203 mm) high.
- d. Base Style: Type F11, Self mounted, 11 inches (279 mm) high.
- e. Base Style: Type FCM, Curb mounted flashing, with inside diameter 27 inches (685 mm) by 27 inches (685 mm) to cover curb by others.

***** NOTE TO SPECIFIER ** The following flashing accessories are optional. Select those required and delete those not required. Flashing insulator is intended to seal the roof opening and prevent condensation forming on the flashing interior from exposure to humid air in unventilated spaces. PVC Boot, verify availability and minimum order quantity, special order that requires 60-day Lead Time**

- f. Flashing Insulator: Type F1, Thermal isolation material for use under flashing.
- g. PVC Boot: Type P, White PVC for flashing to flat PVC roof surfaces.

**** NOTE TO SPECIFIER ** Select the following dome edge protection ring paragraph when roof is fire rated. Delete if not required.**

- h. Dome Edge Protection Band: Type PB, For fire rated roofs. Galvanized steel. Nominal thickness of 0.039 inches (1 mm).

**** NOTE TO SPECIFIER ** Select one of the following four paragraphs and delete those not required. If more than one size is required indicate requirements on the Drawings.**

4. Roof Flashing Turret Extensions: Provide manufacturer's standard extensions for applications requiring:
 - a. Type T12: Additional lengths of 12 inches (300 mm) extension.
 - b. Type T24: Additional lengths of 24 inches (600 mm) extension.
 - c. Type T36: Additional lengths of 36 inches (900 mm) extension.
 - d. Type T48: Additional lengths of 48 inches (1200 mm) extension.
5. Dome Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact PVC; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.
6. Dome Seal: Polypropylene Fiber Pile weatherstrip 0.27 inch (6.85mm) by 0.27 inch (6.85mm).
7. Reflective Tube: Aluminum sheet, thickness 0.018 inch (0.5 mm).
 - a. Interior Finish: Spectralight Infinity high reflectance specular finish on

- exposed reflective surface. Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
- b. Color: a* and b* (defined by CIE L*a*b* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E 308.
8. Reflective 30 degree Adjustable Tube: Aluminum sheet, thickness of 0.018 inch (0.5 mm)
 - a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface. Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
 9. Diffuser Assemblies for Tubes Penetrating Ceilings: Solatube Model 21-C. Ceiling mounted box transitioning from round tube to square ceiling assembly, supporting light transmitting surface at bottom termination of tube, with compression seal to minimize condensation and bug or dirt infiltration; 23.8 by 23.8 inches (605 by 605 mm) square frame to fit standard suspended ceiling grids or hard ceilings.
 - a. Round to square transition box made of opaque polymeric material, classified as CC2, Class C, 0.110 inch (2.8 mm) thick.

**** NOTE TO SPECIFIER ** Select one of the following lens paragraphs and delete paragraphs not required.**

- b. Lens: Type L1 OptiView Fresnel lens design to maximize light output and diffusion with extruded aluminum frame. Visible Light Transmission shall be >90 percent at 0.022 inch (0.6 mm) thick.
- c. Lens: Type L2 Prismatic lens design to maximize light output and diffusion with extruded aluminum frame. Visible Light Transmission shall be >90 percent at 0.100 inches (2.5 mm) thick.
- d. Lens: Type L3 Frosted lens with extruded aluminum frame. Visible Light Transmission shall be >90 percent at 0.050 inches (1.3 mm) thick.

**** NOTE TO SPECIFIER ** The following paragraph is standard with all diffusers (L1, L2 and L3).**

- e. Seal: Closed cell foam, 3 pounds per cubic foot (48 kg per cubic meter).

**** NOTE TO SPECIFIER ** The following paragraph is optional select if required or delete if not required. The Secondary Diffuser is designed to eliminate unwanted glare or reduce light.**

- f. Secondary Diffuser: Type SS, Acrylic plastic classified as CC2 material. Thickness shall not be less than 0.100 inches.

**** NOTE TO SPECIFIER ** The following accessories are optional. Select those required and delete those not required.**

10. Accessories:
 - a. Security Bars: Type B Security Bars 0.375 inch (95 mm) stainless steel bar across flashing diameter opening.
 - b. Security Kit: Type SK Dome Security Kit, rivets with nylon spacers to replace dome screws.
 - c. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required.

**** NOTE TO SPECIFIER ** Select the following dimmer paragraphs for use with Solatube Model 21C only. Delete if not applicable.**

- d. Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; actuator rated at 0.1 amp per unit; controlled by low voltage, series Type T02: circuited, 4 conductor, size 22 cable, and low voltage DC DP/DT switch; providing daylight output between 2 and 100 percent.

- e. Provided with dimmer switch and cable.
Switch: Type SW, Low voltage switch (white) required to operate Daylight Dimmer. Note: only one switch is required per set of synchronously controlled dimmers.
- f. Cable: Type CA, Two conductor low voltage cable (500 ft.)

2.3 ACCESSORIES

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.
- B. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- C. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions.
- B. After installation of first unit, field test to determine adequacy of installation. Conduct water test in presence of Owner, Architect, or Contractor, or their designated representative. Correct if needed before proceeding with installation of subsequent units.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION