SECTION 08625 - TUBULAR DAYLIGHTING DEVICE

PART 1 GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.1 SECTION INCLUDES

A. Tubular daylighting device, consisting of roof dome, curb mounted, reflective tube, extension tubes, supports and diffuser assembly; configuration as indicated below.

B. Accessories.

1.2 RELATED SECTIONS

A. Section 07600 - Flashing: Metal flashings.
B. Section 07700 - Roof Specialties & Accessories
C. Section 13120 - Pre-Engineered Metal Building Systems
D. Section 10110 – Wood Post Buildings

1.3 REFERENCES

F. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position; 2006.

1.4 PERFORMANCE REQUIREMENTS

A. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:
   1. Air Infiltration Test: Air infiltration will not exceed 0.30 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 10.5 psf pressure differential with water rate of 5 gallons/hour/sf when tested in accordance with ASTM E 547.

3. Uniform Load Test:
   a. No breakage, permanent damage to fasteners, hardware parts, or damage to make daylighting system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 150 psf (7.18 kPa) or Negative Load of 70 psf (3.35 kPa).
   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. Hurricane Resistance:
   Meets ASTM E 1886 and ASTM E1996 for missile and cyclic pressuredifferential testing.

5. Fire Testing:
   a. When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the 2006 International Building Code.
   c. Smoke Density - Rating no greater than 450 Per U.B.C. 8-1 (See ASTM Standard E 84) in way intended for use. Classification C.
   d. Rate of Burn and/or Extent - Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2: U.B.C. Standard 26-7. See ASTM D 635.
   e. Rate of Burn and/or Extent - Maximum Burn Extent: 1 inch (25 mm) Classification CC-1: U.B.C. Standard 26-7. See ASTM D 635.

1.2 SUBMITTALS

A. Submit under provisions of Section 01090.

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: Submit Samples of Dome, reflective tube and diffuser.

E. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.
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.
   (LEED 2.1)
   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.

G. Manufacturers and installers qualifications.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engaged in manufacture of tubular daylighting devices for minimum 15 years.

B. Distributor and Installer Qualifications: Engaged in distribution and installation of tubular daylighting devices for minimum 5 years.

1.4 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.

1.5 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.

1.6 WARRANTY

A. Daylighting Device: Manufacturer's standard warranty for 10 years.

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; Email: request info (commsales@solatube.com); Web: www.solatube.com

B. Approved equal by Owner and Architect.
2.2 TUBULAR DAYLIGHTING DEVICES

A. Tubular Daylighting Devices 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 750 DS-O Open Ceiling, 21 inch (530 mm) Daylighting System: (ROAD DEPT GARAGE, WASH BLDG. POLE BARN.)

1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
   a. Outer Dome Glazing: Type DA, 0.125 inch (3.2 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibited, impact modified acrylic blend.
   b. Inner Dome Glazing: Type DPI, 0.115 inch (3 mm) minimum thickness polycarbonate classified as CC1 material.

2. Raybender 3000: Variable prism optic molded into outer dome to capture low angle sunlight and limit high 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.
   b. Base Style: Type FCM, Curb cap, with inside dimensions of 27 inches by 27 inches (685 mm x 685 mm) to cover curb as specified in Section 07600.
   c. Flashing Insulator: Type FI, Thermal isolation material for use under flashing.
   d. Furnish and install TIP Thermal Insulating Panel in all solatubes in accordance with mfg printed instructions.

4. Tube 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.

5. Tube Ring Seal: Attached to the base of the dome ring; butyl glazing rope 0.24 inch (6 mm) diameter; to minimize air infiltration.

6. Dome Seal: Adhesive backed weatherstrip, 0.63 inch (16 mm) tall by 0.28 inch (7 mm) wide.

7. Reflective Tubes: Aluminum sheet, thickness 0.018 inch (0.5 mm).
   a. General:
      1) Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface. Specular reflectance for visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum reflectance (400 nm to 2500 nm) less than 93 percent.
      2) 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.
b. Extension Tube:
   1) Reflective extension tube, Type EXX, Notched for Open Ceiling diffuser attachment, 36 inches long

8. Diffuser Assemblies for Tubes Not Penetrating Ceilings (Open Ceiling):
   Solatube Model 750 DS-O. 21 inch (530 mm) diameter diffuser attached directly to bottom of tube.
   a. Lens: Type L1 OptiView Fresnel lens design to maximize light output and diffusion. Visible Light Transmission shall be greater than 90 percent at 0.022 inch (0.6 mm) thick. Classified as CC2.
   b. Diffuser Seal: Open cell foam, acrylic adhesive backed, 0.75 in (19 mm) wide by 0.125 in (3.2 mm) thick.
   c. Diffuser Trim Ring: Injection molded acrylic. Nominal wall thickness 0.172 inches (4.4 mm)

9. Accessories:
   a. Security Bar: Type B Security Bar 0.375 inch (95 mm) stainless steel bar across flashing diameter opening.
   b. Open ceiling trim ring: Type R, Aluminum. Nominal thickness of 0.018 inch (0.5 mm).
   c. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required.
   d. Security Kit: Type SK Dome Security Kit, rivets with nylon spacers to replace dome screws.

10. Catalog Number:S750 DS-O-DPI-SK-B-FC-FI-E4- E-R-L1- I

11. Additional metal trim ring to be furnished by Contractor and installed by PEMB installer at all penetrations thru PEMB liner panels in wash bldg. Provide PEMB sealant tape and edge closure strips to provide a weathertight seal at trim ring and liner panel.

C. Brighten Up Series: Solatube Model 300 DS: 14 Inch (350 mm) Daylighting System:
   (OFFICE WING)
   1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
      a. Outer Dome Glazing: Type DA, 0.125 inch (3.25 mm) minimum thickness impact resistant injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV C), impact modified acrylic blend.
      b. Raybender 3000: Variable prism optic molded into outer dome to capture low angle sunlight and limit high angle sunlight.
      c. Optional Shock Inner Dome Glazing: Type DI, 0.115 inch (2.9 mm) minimum thickness classified as CC1 material. High impact resistant injection molded acrylic required for high velocity wind zones.
         a. LightTracker Reflector: Aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in dome to capture low angle sunlight.
   2. 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, meeting ASTM A 653/A 653M or ASTM A 463/A 463M, 0.028 inch (0.7 mm) thick.
b. Base Style: Type FC, Curb cap, with inside dimensions of 27 inches by 27 inches (685 mm x 685 mm) to cover curb as specified in Section 07600.
c. Flashing Insulator: Type FI. Thermal isolation material for use under flashing.
d. Dome Edge Protection Band: Type PB, For fire rated roofs. Aluminized steel. Nominal thickness of 0.028 inches (0.7 mm).

3. Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact acrylic; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.

4. Reflective Extension Tube: Type EXX, Aluminum sheet, thickness 0.015 inch (0.4 mm), Length varies with roof pitch.

NOTE: CONTRACTOR TO COORDINATE AND VERIFY LENGTH REQUIRED TO REACH FROM ROOF SURFACE TO FINISHED CEILING.

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 80.2 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.
c. Tube Diameter: Approximately 14 inches (356 mm).

5. Reflective 30 degree Adjustable tube: Aluminum sheet, thickness .015 inch (0.4 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 80.2 percent.

6. Reflective 90 degree Adjustable tube: Aluminum sheet, thickness .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 80.2 percent.
b. Extension Tube Angle Adapter: Provide manufacturer's standard adaptors for applications requiring:
   1) Type A2 two 0 to 90 degree extension tube angle adapters.

7. Ceiling Ring: Injection molded impact resistant acrylic. Nominal thickness is 0.110 inches (2.8 mm).

8. Dual Glazed Diffuser Assembly:
a. Upper glazing: PET GAG plastic with EPDM low density sponge seal to minimize condensation and bug, dirt, and air infiltration per ASTM E283. The nominal thickness is 0.039 inches (0.99 mm).

b. Lower glazing (Optiview Fresnel Lens): Molded polycarbonate plastic classified as CC1 material. The nominal thickness is 0.022 inches (0.61 mm).

c. Diffuser Trim Ring: Injection molded acrylic.

9. Accessories:
   a. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required.

10. Catalog Number: S300 DS-DI-PB-FC-FI-EXX-A2-E-L1-LN

11. Furnish and install TIP Thermal Insulating Panel in all solatubes in accordance with mfg printed instructions.

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. MUST BE COMPATIBLE WITH PEMB MFG. METAL ROOFING PANELS.

D. Contractor to coordinate exact locations of lightubes with other equipment, framing etc., and furnish and install any additional 0-90 degree connectors required for a complete installation.

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
data designated representative. Correct if needed before proceeding with installation of
subsequent units.
   C. Units to be installed over insulated roof curbs installed by PEMB installer.
      Contractor to coordinate and furnish all size requirements with general contractor
and PEMB installer prior to installation.

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