PART 1 GENERAL

1.1 SECTION INCLUDES

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

B. Accessories.

1.2 RELATED SECTIONS

A. Section 075400 – Thermoplastic Polyolefin (TPO) Roofing.

B. Section 262726 – Wiring Devices.

1.3 REFERENCES


I. 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 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 60 psf (2.87 kPa) in accordance with ICC AC-16 Section A, or Negative Load of 70 psf (3.35 kPa) if tested per ICC AC-16 Section B.
      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. When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the 2006 International Building Code.
      b. Self-Ignition Temperature - Greater than 650 degrees F per ASTM D-1929.
      c. Smoke Density - Rating no greater than 450 per 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 per ASTM D 635.
      e. Rate of Burn and/or Extent - Maximum Burn Extent: 1 inch (25 mm) Classification CC-1 per ASTM D 635.

1.5 SUBMITTALS

A. Submit under provisions of Section 013000.

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.

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)

1.6 QUALITY ASSURANCE

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

TUBULAR DAYLIGHTING DEVICE
086250-2
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. Daylighting Device: Manufacturer's standard warranty for 10 years.

B. Electrical Parts: Manufacturer's standard warranty for 5 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Solatube International, Inc.; 2210 Oak Ridge Way, Vista, CA 92081. ASD. Tel. Toll Free: 888-765-2882.; as distributed by Daylighting Solutions; 8352 Corona Loop NE, Albuquerque, NM 87113. Tel 505-243-2000. Fax 505-797-1928. Email daylight@daylighting-solutions.com

B. Substitutions: Not permitted.

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 ICC AC-16.

B. Brighten Up Series: Solatube Model 290 DS: 14 Inch (350 mm) Daylighting System:

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 A), 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. 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 Flat: Flat Type F4, no pitch 4 inches (102 mm) high.

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: Aluminum sheet, thickness 0.015 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.
   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. Ceiling Ring: Injection molded impact resistant acrylic. Nominal thickness is 0.110 inches (2.8 mm).
7. Dual Glazed Diffuser Assembly:
   a. Lower glazing with integral injection molded acrylic Dress Ring classified as CC2 material. Nominal thickness is 0.110 inches (2.8 mm):
      1) JustFrost Decorative Fixture: Full-tempered glass lens (nominal thickness is 0.16 inches (4 mm)), and decorative metal fasteners. Type L9.
   b. 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).
      1) Natural Effect Lens: Type LN.
8. Accessories:
   a. Lighting Fixture for 290 DS model: Bracket mounted inside system just above diffuser; UL listed.
      1) Compact Fluorescent: Type CFL, dedicated compact fluorescent fixture, for one 26 W, 4-pin lamp (not included).
      2) Electrical Requirements: 110 V, 15 amp GFCI circuit for damp and wet conditions.

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.

TUBULAR DAYLIGHTING DEVICE
086250-4
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.
CONCRETE

1. ALL CONCRETE SHALL BE PROPORTIONED, CONSTRUCTED AND CONFORM TO THE SPECIFICATION OF ACI 301–05. CONCRETE DESIGN SHALL CONFORM TO ACI 318–05.

2. PORTLAND CEMENT SHALL CONFORM TO ASTM C–150, TYPE I OR II. CONCRETE IN CONTACT WITH SOIL SHALL BE TYPE II CEMENT.

3. FLY ASH SHALL NOT BE USED IN ARCHITECTURALLY EXPOSED CONCRETE OR TILTWALLS. FLY ASH IS ALLOWED IN ALL OTHER NON-ARCHITECTURALLY EXPOSED CONCRETE, UP TO A MAXIMUM OF 20% OF THE CEMENT CONTENT. THE MIX DESIGN SHALL INDICATE THAT THE FLY ASH SHALL NOT ADVERSELY AFFECT THE PERFORMANCE OF OTHER PRODUCTS AND MATERIALS THAT WILL BE IN CONTACT WITH THE CONCRETE.

4. CONCRETE SHALL BE PROPORTIONED TO THE FOLLOWING REQUIREMENTS:

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>28 DAYS</th>
<th>MAX SIZE AGGREGATE</th>
<th>SLUMP</th>
<th>AIR CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOTINGS</td>
<td>3000 PSI</td>
<td>1 - INCH</td>
<td>3 - 5 INCH</td>
<td>NONE</td>
</tr>
</tbody>
</table>

CONCRETE SHALL BE PROPORTIONED TO EXCEED 75% OF THE 28-DAY STRENGTH IN 7 DAYS.

5. CONCRETE REINFORCING STEEL AND EMBEDS SHALL HAVE THE FOLLOWING PROPERTIES:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ASTM</th>
<th>YIELD STRENGTH</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>REBAR</td>
<td>A615</td>
<td>60 KSI</td>
<td>NOT WELDABLE</td>
</tr>
<tr>
<td>WELDED WIRE REINF.</td>
<td>A185</td>
<td>60 KSI</td>
<td>FLAT SHEETS ONLY</td>
</tr>
<tr>
<td>DEFORMED BAR ANCHORS</td>
<td>A496</td>
<td>60 KSI</td>
<td>WELDABLE</td>
</tr>
<tr>
<td>HEADED ANCHOR STUDS</td>
<td>A108, B</td>
<td>70 KSI</td>
<td></td>
</tr>
</tbody>
</table>

6. UNLESS OTHERWISE SHOWN, THE CLEAR DISTANCE FOR THE FACE OF CONCRETE FORMS TO THE REINFORCING STEEL SHALL BE:

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CLEAR DISTANCE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE CAST AGAINST EARTH OR WATER</td>
<td>3 - INCH</td>
<td>EXCLUDES SLABS ON GRADE</td>
</tr>
<tr>
<td>CONCRETE CAST TO FORMS EXPOSED TO EARTH, WATER OR WEATHER</td>
<td>2 - INCH</td>
<td>NO. 6 BAR AND LARGER</td>
</tr>
<tr>
<td>CONCRETE CAST TO FORMS NOT EXPOSED TO EARTH, WATER OR WEATHER</td>
<td>1 - INCH</td>
<td>NO. 5 BAR AND SMALLER</td>
</tr>
<tr>
<td>SLABS ON GRADE</td>
<td>1 - INCH</td>
<td>SLABS AND JOISTS</td>
</tr>
<tr>
<td></td>
<td>1 - INCH</td>
<td>BEAMS, COLUMNS, &amp; WALLS</td>
</tr>
<tr>
<td></td>
<td>1 - INCH</td>
<td>FROM BOTTOM SURFACE</td>
</tr>
<tr>
<td></td>
<td>1 - INCH</td>
<td>FROM TROWLED SURFACE</td>
</tr>
<tr>
<td></td>
<td>1 - INCH</td>
<td>FROM SCREED SURFACE</td>
</tr>
</tbody>
</table>

7. REINFORCING DETAILING AND PLACEMENT SHALL BE IN COMPLIANCE WITH ACI 318–05.