

**SECTION 08 62 70
TUBULAR DAYLIGHTING Devices**

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies installation and finishing of Tubular Daylighting Devices and Accessories.

1.2 RELATED WORK

- A. Section 26 27 26 - Wiring Devices.
- B. Section 26 09 23 - Lighting Controls.
- C. Section 01 81 11 "Sustainable Design Requirements" for sustainability and LEED requirements.

1.3 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing And Materials (ASTM):

C. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:

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.

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.

Uniform Load Test:

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.

Fire Testing:

When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the 2006 International Building Code.

Self-Ignition Temperature - Greater than 650 degrees F per ASTM D-1929.

Smoke Density - Rating no greater than 450 per ASTM Standard E 84 in way intended for use. Classification C.

Rate of Burn and/or Extent - Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2 per ASTM D 635.

Rate of Burn and/or Extent - Maximum Burn Extent: 1 inch (25 mm) Classification CC-1 per ASTM D 635.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Provide 21 inch model Tubular Skylights that are certified in accordance to NFRC procedures and are rated for the following thermal properties:

1. U-Factor: 0.7
2. Solar Heat Gain Coefficient: 0.2
3. COG Visible Light: 60%

B. Fire Testing:

1. Class B Burning Brand - The burning brand shall self-extinguish without transferring the fire to the dome. See ASTM E 108 and UL 790.
2. Self-Ignition Temperature - Greater than 650 degrees F Per: U.B.C. Standard 26-6. See ASTM D 1929.
3. Smoke Density - Rating no greater than 450 Per U.B.C. 8-1 (See ASTM Standard E 84) in way intended for use.
4. 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.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers literature, data, and installation instructions for types of tubular daylight systems used.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer engaged in manufacture of tubular daylighting devices for minimum 20 years.

B. Installer Qualifications: Installer engaged in installation of tubular daylighting devices for minimum 3 years.

1.7 WARRANTY

A. Ten (10) year transferable warranty from date of purchase against manufacturers defects in material and deterioration.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

C. Store materials in a dry, warm, ventilated weather tight location.

1.9 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.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Tubular Daylighting Device General:

1. High-impact acrylic dome with unique condensation release system and bug and dust proof sealing system.

2. Roof flashing One Piece seamless corrosion resistant steel with thermoplastic coating.

3. Reflective Tubes: Aluminum sheet, thickness 0.018 inch (0.5 mm).

a. General:

b. Interior Finish: high reflectance specular finish on exposed reflective surface. Specular reflectance for visible spectrum (400 nm to 760 nm) greater than 99 percent.

c. 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.

4.

5.

6. Dome security kit and security bar.

B. Model Size 21 inch (533 mm):

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

- a. Outer Dome Glazing: 0.125 inch (3.2 mm) minimum thickness 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. Variable prism optic molded into outer dome to capture low angle sunlight and limit high angle sunlight.
 - a. Inner Dome Glazing: 0.115 inch (3 mm) minimum thickness acrylic classified as CC2 material.
3. Mount:
- a. Roof flashing One Piece: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube. 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.
 - c. Flat roof mount. 11 inches (203 mm) high corrosion resistant steel with thermoplastic coating
 - d. Curb mount corrosion resistant steel flashing with thermoplastic coating, inside dimension 27"x27" to cover curb by others
 - e. Provide security kit and security bar.
4. Light Pipe. 21 inch (533 mm) diameter by 24 inches (610 mm) long. Tube with greater than 99 percent specular reflectance.
- 5.
- a. Provide transition boxes in suspended ceilings as required.
6. Diffuser:
- a. Ceiling Mount: 100 percent impact modified, UV stabilized acrylic 21.25 inch (540 mm) diameter.
 - b. Suspended ceiling transition box with integral diffuser.
Diffuser: Fresnel Lens design to maximize light output and diffusion with extruded aluminum frame and EPDM foam seal to minimize condensation and bug, dirt and air infiltration per ASTM E 283. Visible Light Transmission shall be greater than 90 percent at 0.022 inch (0.6 mm) thick. Classified as CC2.
 - c.

C. Quantity and location:

- 1. Provide number of devices in locations as shown in the following schedule:

Tubular Daylight Device Schedule

RM NO.	ROOM NAME	# OF TUBULAR DAYLIGHT DEVICES
1H111	WELLNESS CENTER	2
1H122	CLASSROOM	4
1H123	CLASSROOM	4
1H124	CLASSROOM	4
1H125	CLASSROOM	4
1H138	TRAINING ROOM	2
1H141	COMPUTER TRAINING ROOM	4
3H310	OPEN OFFICE	4
3H310B	RECEPTION	1
3H310D	OFFICE	1
3H310E	OFFICE	1
3H310F	OFFICE	1
3H310G	OFFICE	1
3H310J	OFFICE	1
3H310K	OFFICE	1
3H312	CONFERENCE ROOM	1
3H313	UNASSIGNED OFFICE	3
3H314	OPEN OFFICE	5
3H314N	OFFICE	1
3H314R	OFFICE	1
3H314S	OFFICE	1
3H314T	OFFICE	1
3H315	OPEN OFFICE	1
3H316	OPEN OFFICE	2
3H317	CONFERENCE ROOM	1
3H318	CONFERENCE ROOM	1
3H319	UNASSIGNED OFFICE	3
3H320	OPEN OFFICE	2
3H320K	RECEPTION	1
3H320E	OFFICE	1
3H320F	OFFICE	1
3H320H	OFFICE	1
TOTAL TUBULAR DAYLIGHT DEVICES		62

2.2 ACCESSORIES

A. Fluorescent Light Kit: Fluorescent light fixture is mounted inside and is wired to the wall switch. Provided with fluorescent Bulb. Requires

switched 120 VAC supply wiring into the 4 inch by 4 inch (102 mm by 102 mm) electrical box with ballast.

- B. Light Pipe Elbows (angle adapters): with greater than 99 percent Specular reflectance and is fully adjustable from 0 to 45 degrees. For use in steep pitch situations or applications where straight pipe runs are not possible.
- C. Additional Light Pipes: Each additional section is 24 inch (610 mm) in length. Provide extra sections of light pipe for tall installations with maximum lengths as follows:
 - 1. 21 inches (533 mm) model - maximum light pipe length = 40 feet (12.19 m).
- D. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.
- E. Suspension Wires: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- F. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.
- G. Security: Provide dome security kits and security bars.
- H. Dome Protection Bands: Provide as required for roof fire rating. Not required for curbsmounted installations.
- I. Local Dimmer Control utilizing a butterfly baffle design with reflective material greater than 99 percent specular reflectance to minimize shadowing when in use: Provided with dimmer switch and cable. Locate adjacent to switches for room lights.
 - 1. Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; maximum current draw of 50 ma per unit; controlled by low voltage, series Type T02: circuited, 4 conductor, size 22 cable; providing daylight output between 2 and 100 percent. Provided with dimmer switch and cable.
 - 2. Switch: Type SW, Manufacturer-specific low voltage DC DP/DT switch (white) required to operate Daylight Dimmer. Note: only one switch is required per set of synchronously controlled dimmers.
 - 3. Cable: Type CA, Two conductor low voltage cable (500 foot) for multiple unit DC connection.
- J.

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

- 1. Clean surfaces thoroughly prior to installation.
- 2. 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. Ceiling:
 - 1. Cut opening for ceiling ring.
 - 2. Attach ceiling ring.
- C. Roof/Attic:
 - 1. Cut opening for penetration.
 - a. Install flashing.
 - b. Measure tube length needed.
 - c. Assemble tube components.
 - d. Install pipe.
 - e. Attach dome.
- D. Ceiling:
 - 1. Snap on diffuser and transition box as required.
 - 2. 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.

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