



CSI SECTION 08623
TUBULAR DAYLIGHTING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tubular Skylights: Engineered and production fabricated tubular daylighting devices (TDD'S) consisting of an aluminum leak-proof flat/pitched/curb mounted self flashings for installation on shingle/wood shake/tile roofs with an acrylic dome assembly, an aluminum ceiling/trim ring assembly, sun light diffuser joined by a highly reflective rigid light tube. The tubular skylight models are categorized by varying diameters; 10", 13", 18" and 21".
- B. Accessories: Adjustable light pipe elbows, light kits with remote controls, adjustable light dimmer, diffuser options for most models.

1.2 RELATED SECTIONS

- A. Section 01352 – LEED Requirements
- B. Section 07311- Asphalt Shingles: Flashing of skylight base.
- C. Section 07320- Roof Tiles: Flashing of skylight base.
- D. Section 07510- Built-up Bituminous Membrane Roofing: Flashing of skylight base.
- E. Section 07530- Electronic Membrane Roofing: Flashing of skylight base.
- F. Section 07550- Modified Bituminous Membrane Roofing: Flashing of skylight base.
- G. Section 07600- Flashing: Metal flashings.
- H. Section 07720 – Roof Accessories: Skylight Curb
- I. Section 08620- Unit Skylights: Skylights without reflective tube.
- J. Section 08630 - Metal Framed Skylights.
- K. Section 16150- Equipment Wiring: Electrical connections
- L. Section 16500- Lighting Equipment and Controls

1.3 REFERENCE STANDARDS

Structural

- A. AMA/WDMA/CSA 101/I.S.2/A440-08 – North American Fenestration Standard/Specification for windows, doors, and skylights (Includes all applicable reference standards).
- B. ANSI 101/I.S.2/NAFS-02 – Voluntary Performance Specification for Windows, Skylights, and Glass Doors (Includes all applicable reference standards).

- C. ASTM E 84- Standard Test Method for Surface Burning Characteristics of Building Materials; 2001
- D. ASTM E 108- Standard Test Methods for Fire Tests of Roof Coverings
- E. ASTM E 283- Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- F. ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- G. ASTM E 331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Static Air Pressure Difference
- H. ASTM E 1886 – 02 - Standard Test Method for Performance of Exterior Window, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- I. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
- J. ASTM D 635 - Test Method for Rate of Burning and/or Extent of time of Burning of Self-Supporting Plastics in a Horizontal Position.
- K. ASTM D-1929-96(2001) – Standard Test Method for Ignition Properties of Plastics.
- L. International Building Code (IBC) – Model building code developed by International Code Council
- M. International Energy Conservation Code (IECC) – Model Energy Building Code
- N. International Residential Code (IRC) – Comprehensive Residential Code That Creates Minimum Regulation for One and Two Family Dwellings of Three Stories or Less.
- O. UL 790 - Standard for Tests for Fire Resistance of Roof Covering Materials.
- P. ICBO-ES AC 16 – Acceptance Criteria for Plastic Skylights
- Q. ICBO-ES Evaluation Report – ER-5874
- R. Miami-Dade PA TAS 201 – Impact Test Procedures.
- S. Miami-Dade PA TAS 202 – Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
- T. Miami-Dade PA TAS 203 – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

Thermal

- A. NFRC 100, Procedure for Determining Fenestration Product U-factors
- B. NFRC 102, Test Procedure for Measuring Steady-State Thermal Transmittance of Fenestration Systems
- C. NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient at Normal Incidence
- D. NFRC 201, Interim Standard Test Method for Measuring the Solar Heat Gain Coefficient of Fenestration Systems Using Calorimeter Hot Box Methods

1.4 DESIGN/ PERFORMANCE REQUIREMENTS

- A. Hurricane Tested and Approved: Natural Light Tubular Skylights have been tested by the Hurricane Test Laboratory, Inc, Riviera Beach Florida in accordance with Miami-Dade County Protocol PA 202, PA 201 and PA 203 to achieve the rating of “hurricane approved”.
 - 1. Uniform Load Test: Withstand rated dead and live loads caused by pressure and uplift of wind acting normal to plane of roof to a download pressure of +60 psf and an uplift pressure of -60 psf measured in accordance with ANSI/ASTM E 330, AAMA/WDMA 1600/17 and PA TAS 202.
 - 2. Air leakage through assembly limited to 0.010 cfm/ft² , measured at a reference differential pressure across assembly of 75 Pa (1.57 psf) as measured in accordance with AAMA/WDMA/ 1600/IS7, ANSI/ASTM E 283 AND PA TAS 202.
 - 3. Water infiltration: No water penetration noted when measured in accordance with AAMA/WDMA1600/IS7, PA TAS 202, and ANSI/ASTM E 331 with a test pressure differential of 12 psf.
 - 4. Large Missile Impact: Passes large Missile Impact Test when measured in accordance with PA TAS 201, and ANSI/ASTEM E 1996, ASTM Missile Level D.
- B. Fire Testing by Manufacturer of Flammable Materials Used meets requirements of the 2006 International Building Code:
 - 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. Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics - U.B.C. Standard 26-5. See ASTM D 2843.
 - 4. Smoke Density- Rating no greater than 450 Per U.B.C. 8-1. See ASTM Standard E 84 in a way intended for use.
 - 5. Rate of Burn- Minimum Burning Rate: 2.5” /min (64mm/min) Classification CC-2: U.B.C. Standard 26-7. See ASTM D 635.

1.5 SUBMITTALS

- A. Submit under provisions of section 01300.
- B. Product data: Manufacturer’s data sheet on every 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: For each finish product specified, two samples, minimum size 6 inches (150mm) square, representing actual product and finish,
- E. Manufacturer’s certificates: Independent Test Lab Reports and Certifications are on file to verify products meet or exceed specified requirements.
- F. LEED Submittals: Provide documentation to support the qualifying LEED Credit’s requirements for the products specified:
 - 1. Energy and Atmosphere: Data on improvement of energy performance credits.
 - 2. Indoor Environmental Quality: Project list and data for perimeter and non-perimeter controllability for the lighting controls and systems in daylight zones.

3. Indoor Environmental Quality: Project list and data for daylight zones for the products specified.
4. Innovation and Design: Data on potential innovation in design credits.
5. Regional Priority: Specific information on regional credits which may be available for the project location.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer engaged in manufacture of tubular skylights for minimum 10 years. Natural Light tubular daylighting devices with exterior roof flashing, dome, light pipe, interior diffuser, and related components required for a weatherproof installation shall be manufactured to the highest standard of quality control in accordance with ICC ES Acceptance Criteria for Quality Control Manuals.
- B. Installer Qualifications: Installer engaged in installation of tubular skylights for minimum 3 years.
- C. Mock-up: Provide a Mock-up for evaluation of surface preparation techniques and application workmanship.
 1. Finish areas designated by architect.
 2. Do not proceed with remaining work until workmanship and color are approved by architect.
 3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in Manufacturers 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.

1.8 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 MANUFACTURERS WARRANTY

- A. Tubular skylights: Manufacturers standard warranty for 25 years.

1.10 COORDINATION

- A. Coordinate work with other operations and installation of roofing materials to avoid damage to installed materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Tubular skylights general:
 1. Natural Light Energy Systems manufactures tubular daylighting devices for models described in the subsequent sections. For projects specifying these products, Natural Light is an acceptable manufacturer. For specific project information, you may contact Elio Gonzalez, Sales Manager; Phone (800) 3639865 or by e-mail at Elio@nltubular.com.

2. High-impact acrylic exterior dome having 90% transparency, impact resistant, and UV inhibitors with unique condensation release system and bug and dust proof sealing system.
3. Seamless high grade, 1100 series, aluminum flashing.
4. Alanod Miro Silver 98% reflective light pipe.
5. Aluminum trim ring, ceiling ring, and stress collar.
6. Photometric IES files are available from Natural Light Energy Systems upon request for the 21 inch model.

B. Model size 10 inch (254 cm):

1. Dome: 100% impact modified, UV stabilized acrylic 11.6 inch (295mm) diameter and 3.75 inches (95mm) rise. Dome set in seamless aluminum collar 1 inch (25mm) high.
2. Mount:
 - a. Roof flashing made of seamless 1100 series aluminum .080 (2mm) inch thick. Dome opening 10.375 inch (263 mm) diameter.
 - b. Sloped mount fabricated with a 4/12 (27 degree) slope. 6.75 inches (171 mm) high at low end, 4 inches (102 mm) high at high end with a 4 inch (102 mm) flashing flange.
 - c. Flat roof mount. 5.625 inches (143 mm) high with a 4 inch (102 mm) flashing flange.
3. Light pipe: 10 inch (254 mm) diameter by 24 inches (610 mm) long. Alanod MIRO-SILVER with 98% total reflectance.
4. Diffuser: 100% impact modified, UV stabilized acrylic 10.25 inch (260 mm) diameter with snap in trim ring available in three options.
 - a. Prismatic.
 - b. White.

C. Model size 13 inch (330 mm):

1. Dome: 100% impact modified, UV stabilized acrylic 15.25 inch (387mm) diameter and 5.0 inches (127mm) rise. Dome set in seamless aluminum collar 1 inch (25mm) high.
2. Mount:
 - a. Roof flashing made of seamless 1100 series aluminum .080 (2mm) inch thick. Dome opening is 13.325 inches (339mm) diameter. Overall diameter is 26.5 inches (673mm).
 - b. Sloped mount fabricated with a 4/12 (27 degree) slope. 7.375 inches (171 mm) high at low end, 4 inches (102 mm) high at high end with a 4 inch (102 mm) flashing flange.
 - c. Flat roof mount. 5.5 inches (140 mm) high with a 4 inch (102 mm) flashing flange.
 - d. Curb mount. 22.375inches (568mm) square curb with a 9.25 inches (235) rise and dome opening is 13.325 inches (339mm).
3. Light pipe: 13 inch (330 mm) diameter by 24 inches (610 mm) long. Alanod MIRO-SILVER with 98% total reflectance.
4. Diffuser: 100% impact modified, UV stabilized acrylic 13.25 inch (337 mm) diameter with snap in trim ring available in three options with snap in trim ring available in three options:

- a. Prismatic
- b. White

D. Model size 18 inch

1. Dome: 100% impact modified, UV stabilized acrylic 20.25 inch (514mm) diameter and 3.75 inches (95mm) high. Dome set in seamless aluminum collar 1 inch (25mm) high.
2. Mount:
 - a. Roof flashing made of seamless 1100 series grade aluminum .080 (2mm) inch thick. Dome opening 18.375 inch (467 mm) diameter.
 - b. Sloped mount fabricated with a 4/12 (27 degree) slope. 9.75 inches (248 mm) high at low end, 4 inches (102 mm) high at high end with a 4 inch (102 mm) flashing flange.
 - c. Flat roof mount. 5.5 inches (140 mm) high with a 4 inch (102 mm) flashing flange.
3. Light pipe: 18 inch (457 mm) diameter by 24 inches (610 mm) long. Alanod MIRO-SILVER with 98% total reflectance.
4. Diffuser: 100% impact modified, UV stabilized acrylic 13.25 inch (337 mm) diameter with snap in trim ring available in three options with snap in trim ring available in three options:
 - a. Prismatic
 - b. White

E. Model size 21 inch (353mm):

1. Dome: 100% impact modified, UV stabilized acrylic 22.75 inch (578mm) diameter and 5 inches (127mm) high. Dome set in seamless aluminum collar 1 inch (25mm) high. Overall diameter is 33.75 inches (857mm).
2. Mount:
 - a. Roof flashing made of seamless 1100 series grade aluminum .080 (2mm) inch thick. Dome opening 21.375 inch (543 mm) diameter. Overall diameter is 33.75 inches (857mm).
 - b. Flat roof mount. 8 inches (203 mm) high with a 4 inch (102 mm) flashing flange.
 - e. Curb mount. 28 inches (711mm) square curb with a 5.25 inches (133mm) rise and dome opening is 21.375 inches (543mm).
3. Light pipe: 21 inch (533 mm) diameter by 24 inches (610 mm) long. Alanod MIRO-SILVER with 98% total reflectance.
4. Trim ring/transition box and diffuser, 100% impact modified, UV stabilized acrylic:
 - A. Warehouse trim ring for open ceiling with 21.25 inch (540mm) diameter.
 1. Prismatic
 - B. Transition box for drop ceiling applications with a 23.75 inch (603mm) square aluminum frame, 6inch rise, and 21.25 inch (540mm) light pipe opening. It includes a square 22.5 inch (572mm) diffuser.
 1. Prismatic

2.3 ACCESSORIES

- A. Incandescent light kit: incandescent light fixture is mounted inside and is wired to the wall switch capable of sizes up to a 60 watt bulb. Requires switched 120 VAC supply wiring into the 4 x 4 inch (102mm x 102mm) electrical box.
- B. 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 x 4 inch (102mm x 102mm) electrical box with ballast.
- C. Exhaust fan: SVFAN. Our Super Vent Fan (SVF) is capable of exhausting 125 cfm enough to vent a bathroom and shower stall. Natural Lights ingenious design disguises the intake vent in a sleek trim ring that holds the skylight diffuser. No more ugly vent grates! The vent is then connected to a motor that is remote located in your attic space, making it extremely quiet. Flexible exhaust tubing allows for many venting options including a dual exhaust in your shower stall. The SVF can also accommodate the light kit for evening lighting.
- D. Light pipe elbows (angle adapters): constructed of Alanod MIRO-SILVER with 98% total reflectance and is fully adjustable from 0 to 30 degrees or 45 degrees. Elbows are for use in steep pitch situations or applications where straight pipe runs are not possible.
- E. Additional light pipes: each additional section is 12 or 24 inches in length. Provide extra sections of light pipe for tall attic installations with maximum lengths as follows:
 - 1. 10 inches (254mm) model- maximum light pipe length = 18 feet (5.49 m)
 - 2. 13 inches (330mm) model- maximum light pipe length = 20 feet (6.10 m)
 - 3. 18 inches (457mm) model- maximum light pipe length = 20 feet (6.10 m)
 - 4. 21 inches (533mm) model- maximum light pipe length = 20 feet (6.10 m)
- F. Adjustable Light Dimmers: Available for 10 inch, 13 inch, and 21 inch models. Includes a 12 inch section of light pipe, rotating reflective disk and is equipped with remote controlled or operable 110 volt motor.
- G. Fasteners: same material as metals being fastened, non-magnetic steel, non corrosive metal of type recommended by manufacturer, or injection molded nylon.
- H. Suspension wire: steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- I. 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 INSTALLATION

- A. Install in accordance with manufacturers printed instructions.
- B. Ceiling:
 - 1. Cut opening for ceiling ring.

2. Attach ceiling ring
- C. Roof/Attic:
1. Cut opening for penetration.
 2. Install flashing.
 3. Measure tube length needed.
 4. Assemble tube components.
 5. Install pipe.
 6. Attach dome.
- D. Ceiling:
1. Snap on diffuser
- E. 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