



SECTION 26 55 00
DAYLIGHTING AND LED FIXTURES (Sunoptics LightFlex LED)

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. LightFlex LED Daylighting and LED Lighting System for suspended-ceiling applications. (Model SLFTL)
- B. Light fixtures.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Wood Framing; Site built wood curbs and nailers.
- B. Section 07 31 00 - Roof Shingles and Shakes: Flashing of skylight base.
- C. Section 07 32 00 - Roof Tiles: Flashing of skylight base.
- D. Section 07 50 00 - Membrane Roofing.
- E. Section 07 51 00 - Built-Up Bituminous Roofing: Flashing of skylight base.
- F. Section 07 52 00 - Modified Bituminous Membrane Roofing: Flashing of skylight base.
- G. Section 07 53 00 - Electrometric Membrane Roofing: Flashing of skylight base.
- H. Section 07 54 00 - Thermoplastic Membrane Roofing: Flashing of skylight base.
- I. Section 07 60 00 – Flashing and Sheet Metal: Metal curb flashings
- J. Section 07 62 00 - Sheet Metal Flashing and Trim
- K. Section 08 62 23 – Tubular Daylighting Devices
- L. Section 08 63 13 - Domed Metal-Framed Skylights
- M. Section 09 21 16.33 - Gypsum Board Area Separation Wall Assemblies.
- N. Section 09 51 23 - Acoustical Tile Ceilings.
- O. Section 26 51 00 - Interior Lighting.
- P. Section 26 09 43 - Network Lighting Controls.

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI C78.377 - Specifications for the Chromaticity of Solid State Lighting Products.

- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - 1. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- C. ASTM International (ASTM):
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
- D. Design Lights Consortium (DLC):
 - 1. Design Lights Consortium Networked Lighting Control System Specification V2.0.
- E. Factory Mutual System (FM Global):
 - 1. FM Approval Guide, Chapter 18 - Building Materials.
 - 2. FM Standard 4430 - Test Criteria for Heat and Smoke Vents.
 - 3. FM Standard 4431 - Test Criteria for Skylights.
- F. National Fenestration Rating Council (NFRC):
 - 1. NFRC 100 - Procedure for Determining Fenestration Product U-Factors.
 - 2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance of Normal Incidence.
- G. North American Fenestration Standard (NAFS):
 - 1. AAWAWDMACSA1011.S.2A440 - The Voluntary Performance Specification for Windows, Skylights, and Glass Doors.
- H. Occupational Health and Safety Administration (OSHA):
 - 1. OSHA 1926.502 - Fall protection systems criteria and practices.
 - 2. OSHA 1910 - Occupational Safety and Health Standards.
- I. Restriction of Hazardous Substances (RoHS):
 - 1. Directive 2011/65/EU (RoHS-Recast or RoHS 2).
- J. Underwriter's laboratory (UL):
 - 1. UL 924 - Emergency Lighting and Power Equipment.
 - 2. UL 8750 - Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products.
 - 3. UL 8754 - Holders, Bases, and Connectors for Solid-State (LED) Light Engines and Arrays.
- K. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- L. ASTM E 283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- M. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors.
- N. ASTM E 547 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain walls by Cyclic Air Pressure Difference.
- O. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic

Pressure Differentials.

- P. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricane.
- Q. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- R. ASTM D 1929 - Test Method for Ignition Properties of Plastics.
- S. ASTM D 2843 – Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
- T. ASTM F 1642 – Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loading.
- U. ASTM F 2912 – Standard Specification for Glazing and Glazing Systems Subject to Airblast Loading.
- V. GSA-TS01-2003: Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings
- W. Florida Building Code TAS 201 – Impact Test Procedures.
- X. Florida Building Code TAS 202 – Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading.
- Y. Florida Building Code TAS 203 – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading

Z.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 30 00 - Administrative Requirements.
- B. Product Data: Submit manufacturers current published data on each product to be used including:
 - 1. Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features:
 - a. LED Luminaires: Include estimated useful life, calculated based on IES LM-80 test data.
 - 2. Materials, dimensions, finishes and standard details.
 - 3. Compliance with design criteria and project conditions.
 - 4. Preparation instructions and recommendations.
 - 5. Storage and handling requirements.

6. Installation instructions.
- C. Test Reports: Submit Third Party Testing and Evaluation Reports as required by the local jurisdiction.
- D. Shop Drawings: Include the following:
1. Where design calculations are required, provide shop drawings and calculations
 2. Plans, sections, elevations, flashing, connection, and termination details.
 3. Fabrication and installation details including glazing types, methods of attachment and provisions for thermal movement.
 4. Roofing system provided by others including insulation.
 5. Interface details including overall dimensions, thicknesses, and adjacent materials.
 6. Safety requirements.
 7. Provide type of diffuser and/or color shifting lens
- E. Closeout Submittals:
1. Operation and maintenance instructions for product.
 2. Provide Warranty.
 3. Provide manufacturers contact information for replacement parts and technical assistance.
 4. General Contractor responsible for coordinating bid documents. To include pricing from roofing and electrical subcontractors for material and labor associated with LightFlex LED installation.

1.5 QUALITY ASSURANCE

- A. Qualifications:
1. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of twenty years experience in the Toplighting industry. Secondary products shall be acceptable to the primary manufacturer.
 2. Installer Qualifications: All products shall be installed by a single installer with a minimum of five years demonstrated experience, with adequate equipment, skilled workers, and practical experience to meet the project schedule.
- B. Skylights shall conform with authorities having jurisdiction and be designed to meet design criteria of the project location and the following:
1. Skylights must be certified by NFRC.
 2. Tested and labeled in accordance to AAMAWDMACSA1011.S.2A440.
 3. Factory Mutual (FM) Approval Class Number 4430 or 4431 as applicable.
 4. Projects which fall under the jurisdiction of the Florida Building Code must have a current Florida Building Code (FBC) Number to meet the High Velocity Hurricane Zone (HVHZ) requirements and are required for acceptance of Work specified in this section. Skylight must comply with the jurisdictional code body's submittal data and supporting drawings and documentation. Where the code body's acceptance criteria differs from these specifications regarding components and hardware, the code body's requirements shall govern.
 5. Meet or exceed 200 pound (90 kg) Drop Tests.
 6. Skylights shall be designed and installed to carry a minimum 30 psf (1.44 kPa) tributary roof load or greater per site.
- C. LED Lighting and controls shall conform with authorities having jurisdiction and be designed to meet design criteria of the project and the following:
1. DesignLights Consortium Networked Lighting Control System Specification V2.0.
 2. Components and the manufacturing facility where product was manufactured must be RoHS compliant.
 3. Where required for egress and/or emergency lighting control the devices, relays and

fixtures shall conform to UL 924.

4. Integration with Building Management Systems (BMS) and Heating, Ventilation and Air Conditioning (HVAC) equipment.
- D. Pre-Installation Meeting: Convene on the project site minimum one week before beginning work to:
- 1.
 2. With General Contractors guidance, coordinate between trades.
 - a. Roofing Contractor to install the skylight, curb and full tubular LightFlex LED system assembly
 - b. Electrical Contractor to wire components and program nLight lighting controls.
 3. Verify project requirements and site logistics.
 4. Assess integrity of the roofing system and building structure.
 5. Review manufacturers installation instructions and warranty requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Coordinate delivery schedule with the General Contractor and project schedule to minimize on site storage.
- B. Store products in manufacturer's unopened packaging until ready for installation. Store materials in a dry area, protected from freezing, staining, contamination or damage.
- C. Do not exceed structural loading with workers or installation materials.

1.7 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 limits.
 1. Review manufacturers installation instructions and warranty requirements.

1.8 WARRANTY

- A. Provide manufacturer's standard warranty covering defective materials, workmanship and performance including the following Warranty Periods:
 1. Leak Free Warranty:
 - a. 10 years.
- B. Reference <https://www.acuitybrands.com/resources/terms-and-conditions> for details on Sunoptics warranty program

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Sunoptics Prismatic Skylights , which is located at: 6201 27th St.; Sacramento, CA 95822; Tel: 916-395-4700; Fax: 916-395-9204; Email: SunOpticsInsideSales@AcuityBrands.com; Web:www.sunoptics.com
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 LIGHTFLEX DAYLIGHTING DEVICES

- A. Model SLFTL, Tubular System, LightFlex Daylighting Devices: Daylighting devices bring natural light into suspended, finished ceiling applications that do not have direct access to the roof while meeting the following criteria:
1. FM Approved, with polycarbonate, with CC1.
 2. High Velocity Hurricane Zone (HVHZ) Approved, with CC1CC2 (Single or Double Glazed).
 3. AAMA Certified.
 4. NFRC Certified.
 5. Performance: Optic sphere increases daylight conveyance, 98 percent reflective MIRO-SILVER interior light well with greater than 99 percent specular quality, adjustable elbows to bypass obstructions typically yield the following values:
 - a. Solar Heat Gain Coefficient (SHGC): 0.24.
 - b. U-Value: 0.40.
 - c. Visible Light Transmission (VLT): 0.40 to 0.68.
 6. Frame: 6063-T5 extruded aluminum frame with mitered and welded corners, and integral condensation and weepage gutters to drain moisture to the outside.
 7. Frame Finish:
 - a. MI: Mill.
 - b. WH: White.
 - c. BZ: Bronze.
 - d. CF: Custom Finish as selected by the Architect.
 8. Glazing: Single Glazed (SGZ).
 9. Glazing: Double Glazed (DGZ).
 10. Skylight Lens Material: CC1CC2 Polycarbonate.
 11. Skylight Lens Material: CC1 Polycarbonate.
 12. Skylight Lens Material: CC2CL1 Acrylic Class 1.
 13. Skylight Lens Material: CC2CL3 Acrylic Class 3.
 14. Optic Sphere Lens Material: Acrylic prismatic.
 15. Roof Curb:
 - a. Insulated Curb, Aluminum: Aluminum with fiberglass insulation.
 - b. Insulated Curb, Galvalume: Model AMBC-1, 18 ga. galvalume, full height mitered and welded corners, cell caps supplied loose for field location, including fiberglass insulation, integral cricket water diverter.
 - c. Outside Dimensions: 25 by 25 inch (635 by 635 mm).
 - d. Inside Dimensions: 22 by 22 inch (559 by 559 mm).
 - e. Height: 8 inch (203 mm): 2108.
 - f. Height: 14 inch (356 mm): 2114.
 - g. Height: As shown on the Drawings.
 16. Standard Kit includes the following:
 - a. Signature Series skylight assembly.
 - b. Optic sphere.
 - c. Curb transition.
 - d. 18 inches (457 mm) roof curb top tube.
 - e. 8 inch (203 mm) Curb with curb sealing tape.
 - f. 24 inches (610 mm) light well tubes one and two (Length callout by layout).
 - g. Round to square transition.
 - h. Ceiling diffuser (Diffuser lens style callout by selected style).
 - i. Single blade louver.
 - j. Open Loop Sensor
 - k. CAT 5 cable for Sensor
 - 17.
 18. Light Well Length: 4 foot (1219 mm) shaft (minimum length available): 4FT.
 19. Light Well Length: 6 foot (1829 mm) shaft: 6FT.
 20. Light Well Length: 8 foot (2438 mm) shaft: 8FT.
 21. Light Well Length: 10 foot (3048 mm) shaft: 10FT.

22. Light Well Length: 12 foot (3658 mm) shaft: 12FT.
23. Light Well Length: 14 foot (4267 mm) shaft: 14FT.
24. Light Well Length: 16 foot (4877 mm) shaft: 16FT.
25. Light Well Length: 18 foot (5486 mm) shaft: 18FT.
26. Diffuser Lens Style: TLED shadowbox lens assembly: TLSBOX.
27. Diffuser Lens Style: A19 lens assembly: TLA19.
28. Diffuser Lens Style: TLED microprism lens assembly: TLMICPRIS.
29. Diffuser Lens Style: Magellan white flat round lens.
30. Diffuser Lens Style: Magellan white prismatic round lens.
31. Diffuser Lens Style: ALLED troffer: ALLED.
32. Diffuser Lens Style: ACL ACLED troffer lens assembly: ACL.
33. Diffuser Lens Style: TLSATIN satin lens assembly: TLSATIN.
34. Provide with the following options:
 - a. Adjustable Elbows, One Set: 2 elbows, each 15-1/2 inch (394 mm) long: ELBOWS.
 - b. Adjustable Elbows, Two Sets: 4 elbows, each 15-1/2 inch (394 mm) long: ELBOWS2.
 - c. Suspension wire kit: SUSKIT.
 - d. Drywall grid adaptor: DWGA (available for Magellan Lens option only).
 - e. Security bar: SBAR.
 - f.
 - g. Occupancy Sensor (PIR): passive infrared occupancy sensor.
 - h. Occupancy Sensor (PDT): Dual technology occupancy sensor PIR and microphonics.
 - i. Battery Pack: 10W integral battery back-up: E10W (For Emergency Lighting).

2.3 LED LIGHTING

- A. Model SLFTL, Tunable LED Device: Provide tunable-white LEDs to provide lighting during the early morning or evening hours when daylight is not available while meeting project criteria.
- B. Model SLFTL, Tunable LED Device Controls: Provide integrated sensor that works in conjunction with the lighting controls system such that the LEDs will supplement daylight coming through the tubular daylighting system.
- C. Lighting Control System:
 1. The lighting control system shall provide time-based, sensor-based (both occupancy and daylight), and manual lighting control.
 2. The system shall be capable of turning lighting loads on/off as well as dimming lights (if lighting load is capable of being dimmed). Specific dimmers will be capable of "dimming lights to off".
 3. System devices shall be networked together, enabling digital communication between devices, and shall be individually addressed.
 4. The system architecture shall be capable of enabling stand-alone groups (rooms) of devices to function in some default capacity, even if network connectivity to the greater system is lost.
 5. The system architecture shall facilitate remote operation via a computer connection.
 6. The system shall not require any centrally hardwired switching equipment.
 7. The system shall be capable of wireless, wired, or hybrid wireless/wired architectures.
- D. Fixtures:
 1. Light Source: Tunable white LED.
 - a. LED Output (LM): 3000 to 4000 delivered lumens. Reference LightFlex LED data sheet for detailed performance data.
 - b. Dynamic Feature (TUWH): Tunable.
 - c. Dynamic Range: PROR (Productivity range) (3000K to 5000K).

- d. Dynamic Range (Default): RHYR (Rhythm Range) (2700K to 6500K).
- e. LED Color Rendering (Default) CRI (80 CRI): 80+.
- f. LED Color Rendering CRI (90CRI): 90+.
- g. Minimum Dimming Level: Dark. Less than 1% dimming.
- h. Control Input: nLight Enabled.
- i. Voltage: 120 V.

2.4 ACCESSORIES

- A. Installation Screws: #12 x 1-1/2 inch (38 mm) 300 series stainless steel screws with neoprene stainless steel bonded washers in quantity recommended by the manufacturer.
- B. Safety Security Guard, Model ESFP: External Fall Protection of galvanized cold rolled steel, to meet OSHA 1910.23 requirements.

2.5 FABRICATION

- A. Fabricated frames from 6063 T6 aluminum with integral condensation and weeping gutters to drain interior moisture to the outside.
- B. Skylights shall be factory assembled and glazed ready for installation, pre-drilled for anchorage to roof curbs.
- C. Fabricate skylights weather tight and free of visual distortions and defects.
- D. Multi-glazed units include Insulated Thermal Break (ITBR), Curb Seal Tape, Weather Sweep (WSW) and screws.
- E. Protect exterior drip counter flashing and drainage ports from weather and air-borne debris.
- F. Miter and full penetration weld all corners of curb and retaining frames with glazing separated from the skylight frame with a silicone seal along the full perimeter of the retaining frame.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Confirm work by others is installed per the project requirements. Do not cover work by others prior to inspection or acceptance.
 - 2. Do not begin installation until substrates have been properly prepared.
 - 3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- B. Do not proceed until unacceptable conditions are corrected.

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 instructions and in proper relationship with adjacent construction. Test for leaks as recommended by manufacturer.

3.4 CLEANING

- A. Remove all debris from the project site in accordance with the Owner's construction waste management requirements.

3.5 PROTECTION

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

END OF SECTION