Streetlight Luminaire, LED, Pendant-Mount, Boulevard

1. Scope

This standard covers the material requirements for an 80-watt streetlight luminaire, LED, pendant-mount. LED luminaires are also known as solid state light (SSL) source fixtures.

This standard applies to Seattle City Light (SCL) Stock No. 013526.

2. Application

LED, pendant-mount, boulevard streetlight luminaires are currently installed along Lake Washington Boulevard in the Washington Park Arboretum. For installation in the Arboretum, use steel pole Stock No. 013464 and steel arm Stock No. 013465. See SCL 5683.01.

3. Industry Standards

ANSI C136.15-2011 (or latest); Roadway and Area Lighting Equipment– Internal Labeling of Luminaires

ANSI C136.22-2004 (R2009); Ingress Protection (Resistance to Dust, Solid Objects and Moisture) for Luminaire Enclosures

ANSI C136.31; Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100 000 cycles by an independent lab)

ANSI C136.37 2011; Solid State Light Sources Used in Roadway and Area Lighting

ASTM B117-73; Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM D 2247; Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity

IEEE C62.41.2-2002; "Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits"

4. Requirements

Operating temperature, range	
°C	-40 to +55
°F	-40 to +130
Correlated Color Temperature (CCT), nominal, °K, per ANSI/NEMA/ANSLG C78.377	4000 (+/- 350K)
Color rendering index (CRI), minimum	70
Lumen depreciation of LED light sources per IES LM-80	LED module(s)/ array(s) shall deliver at least 70% of initial lumens (L_{70}), when installed for a minimum of 70,000 hours
Light distribution per IES Handbook, chapter 22	Type II Medium
Backlight, Uplight and Glare (BUG) rating per IESNA TM-15, Addendum A	B2, U0, G1
Uplight per IESNA TM-15	UL & UH = 0 (full cutoff)
High and very high light per IES TM-15, maximum of luminaire lumens	BH = 5% BVH and FVH = 0.2%
Luminaire efficacy, type II distribution, lumens/watt, minimum, per IES LM-79, Section 11.0	94.3
Off-state power consumption, W, maximum - Photocell	1
On-state power consumption, excluding control device, watt, maximum	79
Luminous flux distribution at median driver current, lumens, minimum	7454
Effective projected area (EPA), maximum, ft^2	1.42
Total harmonics distortion at full power across specified voltage range, maximum	20%
Vibration withstand, minimum, per ANSI C136.31	Level 2.0

5. Construction

5.1 General

The luminaire shall be designed and constructed to meet the requirements of ANSI C136.37.

Luminaire features conforming to ANSI C136.37 shall include, but not be limited to: mounting provisions, latching and hinging, terminal blocks, dimming, ingress protection, wiring and grounding, and photo-control receptacle.

Luminaire shall be RoHS (European Union Directive 2002/95/EC for Restriction of Hazardous Substance) compliant. Luminaire shall have less than the maximum concentration values of the following RoHS restricted substances:

- Mercury (Hg)
- Cadmium (Cd)
- Chromium VI (Cr +6)
- Polybrominated biphenyl (PBB)
- Polybrominated biphenyl ether (PBDE)
- Lead (Pb).

5.2 Fixture Housing

Luminaire housing shall be cast aluminum.

Luminaire external housing shall have a minimum rating of IP65 as specified in IEC 60529, with the ability to shed water from inside the housing (i.e.; weep holes).

Luminaire door shall be securely hinged and incapable of involuntary separation from housing when accessed in field-installed position.

Luminaire optical chamber shall have a minimum rating of IP66 as specified in IEC 60529.

Luminaire cooling system shall consist of a passive heat sink with no fans, pumps, or liquids.

All fasteners shall be stainless steel.

Complete assembly weight shall not exceed 45 lb.

Luminaire design shall facilitate hose-down cleaning and discourage debris accumulation.

5.3 Electrical

Power supply/driver shall be provided with a control signal interface with operating range of 0 to 10 Vdc for dimming.

Rotational adjustment of the photo control shall be tool-less.

Luminaire circuitry shall include quick connect/disconnects to allow easy separation and removal of driver and power door.

Luminaire photocontrol receptacle shall be designed and constructed to accept a standard plug type, locking, three-pole, three-wire, streetlight photo control. Photocontrol receptacle shall also be configured with the addition of a minimum of two conductive pads, as defined in ANSI C136.41. Four conductive pads are optional.

The two conductive pads shall be connected to the 0-10 Vdc control signal interface on the power supply/drive with quick-disconnect connectors.

Wire harnesses shall be protected with a spiral wrap to prevent damage to the wire insulation when operating the power door.

A three-pole terminal block capable of accepting #14 to #6 AWG wire shall be mounted to the housing inside the electrical compartment.

Terminal block shall be capable of operation with a standard #2 flat blade screwdriver.

Luminaire shall meet the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 15 – Radio Frequency Devices.

5.4 Mounting

Luminaire shall be 4 bolts and designed to mount on a 2-in nominal pipe size (NPS) tenon.

Luminaire shall be capable of ±5 degrees of tilt, minimum, for leveling adjustment and labeled properly.

Tenon mounting area opening shall be limited to 1/4-in over the range of tenon sizes and leveling adjustment to prevent entrance of wildlife as specified in ANSI C136.37.

Methods of limiting tenon mounting area shall provide safe access for temporary service feeds entering directly through the tenon opening without damaging service wires.

5.5 Finish

Luminaire housing finish shall be powder-coated black, RAL9005.

Painted or finished luminaire components exposed to the environment shall exceed a rating of six per ASTM D1654 after 1000 hours of testing per B117.

Painted or finished luminaire components exposed to the environment shall exhibit no greater than 30% reduction of gloss per ASTM D523, after 500 hours of QUV testing at ASTM G154 Cycle 6.

5.6 Certification and Listing

Power supply/driver shall be UL Recognized for dry and damp locations.

All other electrical components shall be UL Listed or recognized for wet locations.

6. Testing

Test data that establishes compliance with the requirements of this material standard shall be provided upon request.

Certificate of RoHS (European Union Directive 2002/95/EC for Restriction of Hazardous Substances) compliance shall be provided upon request.

7. Product Approval

Manufacturers interested in having their luminaire(s) approved for purchase by Seattle City Light must participate in the stepped process summarized below. Contact Streetlight Engineering for details:

- Review fixture test reports
- Computer modeling of fixture light distribution
- Laboratory testing of sample fixture and shield
- Field trial of sample fixture(s) and shield(s)
- Field trial review and evaluation.

Manufacturers are encouraged to plan accordingly. The approval process can take up to six months to complete.

8. Design Changes

Manufacturers shall inform SCL in writing of all design changes that may affect the product's understood or published capabilities.

9. Marking

9.1 Internal Labeling

A readily visible label shall be permanently affixed to the inside surface of each luminaire housing.

Internal label shall meet the requirements of ANSI C136.22.

Internal label shall include, but not be limited to, the following information:

- Manufacturer's name and catalog number
- Month and year of manufacture
- Line input voltage
- Frequency if other than 60 Hz
- Driver type (if applicable) (may be on driver if readily visible)
- Photo control voltage if different from line input voltage
- Lamp type, wattage, and voltage (if applicable; may be on driver if readily visible)
- Descriptive wiring diagram showing input terminals, ballast, capacitors, starting aid, photo control receptacle, lamp, and other items, as necessary
- Plant location
- Input power consumption
- Driver output current
- Driver output adjustment
- IEC IP rating
- Correlated color temperature (CCT)
- IES light distribution type
- IESNA TM-15 BUG ratings
- Serial number.

9.2 External Marking

A readily visible marker shall be permanently affixed to the outside surface of the luminaire housing.

External marker shall meet the requirements of ANSI C136.15.

External marker type shall be large per ANSI C136.15.

9.3 Barcode

A barcode label shall be provided as specified in the purchase order.

9.4 Component Identification

All UL Listed components shall be labeled or recognized as such.

10. Packaging

Luminaires shall be individually packaged to prevent damage during shipping, inside storage, and casual handling prior to installation.

Each package shall be legibly marked with:

- Manufacturer name
- Manufacturer's catalog number
- Product description
- Date of manufacture (month and year)
- SCL stock number
- SCL purchase order number.

Accessories shall be individually packaged to prevent damage during shipping, inside storage, and casual handling prior to installation.

11. Issuance

EA

12. Approved Manufacturers, Luminaire, Stock No. 013526

Manufacturer:	Lumec
Catalog Number:	DMS50-80W48LED-4K-G3-LE2F-120-DMG-SMB-PH8-RCD7-BK
where:	
DMS50 =	series Domus Urban luminaire
80W48LED4K =	80 W, 48 LEDs, 4000K LED module
G3 =	Gen
LE2F =	optical system, Type 2 (ASYM) flat glass lens
120 =	voltage, 120 V
DMG =	driver option 0-10 V
SMB =	adapter, decorative contemporary side-mounted cast-aluminum, accepts tubes from 1-5/8" to 2-3/8"
PH8 =	luminaire option, photoelectric cell
RCD7 =	luminaire option, receptacle 7 pins
BK =	finish, smooth black

13. References

SCL Material Standard 5683.01; “Steel Streetlight Pole and Arm Assemblies”

14. Sources

Lumec by Signify, DMS50-Domus-LED 04/21

Philips Lumec, Specification Sheet, Doc. No. SPEC20170223_173441_10361_0.doc, February 27, 2017