

## Streetlight Luminaire, LED, Side-mount, Residential, 52-watt

**Not for new construction. For maintenance of existing facilities only.**



### 1. Scope

This standard covers the requirements for 52 watt, side-mount, outdoor type, light-emitting-diode (LED) streetlight luminaires and their accessories. LED luminaires are also known as solid state light (SSL) source fixtures,

This standard applies to the following Seattle City Light stock numbers:

<b>Stock Number</b>	<b>Description</b>
013354	Luminaire
013355	House side shield for BetaLED luminaire

### 2. Application

52 watt LED streetlight luminaires are side-mounted on 2-inch nominal pipe size (NPS) tenons on poles to provide light to residential neighborhoods.

52 watt LED streetlights are not intended for installation in bridge and overpass applications.

52 watt LED streetlights are intended for installation at a 25-foot mounting height.

A 52 watt LED streetlight consumes approximately 62 percent less energy than a conventional 100 watt high-intensity discharge (HID) luminaire.

In 2012, 52 watt LED streetlight luminaires replaced less-efficient 70 watt units for new construction. In 2013, City Light transitioned to a new 38-watt unit, Stock Number 013469 for new construction.

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Handwritten signature of John Shipek in black ink.

Handwritten signature of Darnell Cola in black ink.

LED life is greater than 50,000 hours. LED streetlight luminaires are 100 percent mercury- and lead-free.

52 watt LED luminaires use Stock No. 013556 luminaire shields.

Streetlight Engineering must pre-approve all installations of luminaire shields. Contact Streetlight Engineering for details.

52 watt LED streetlights are intended to meet the performance criteria set forth in the latest revision of Seattle City Light's Specification for LED Roadway Luminaires.

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### 3. Industry Standards

LED streetlight luminaires shall meet the applicable requirements of the following industry standards:

**ANSI/NEMA/ANSLG C78.377-2008**; Specifications for the Chromaticity of Solid State Lighting (SSL) Products

**ANSI C136.31-2010**; American National Standard for Roadway Lighting Equipment – Luminaire Vibration

**ANSI C136.37 2011**; American National Standard for Roadway and Area Lighting Equipment – Solid State Light Sources Used in Roadway and Area Lighting

**ASTM B117-09**; Standard Practice for Operating Salt Spray (Fog) Apparatus

**ASTM D1654-08**; Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

**ASTM D523-08**; Standard Test Method for Specular Gloss

**ASTM G154-06**; Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

**C136.15-2011** (or latest); American National Standard for Roadway and Area Lighting Equipment – Internal Labeling of Luminaires

**C136.22-2004 (R2009)**; American National Standard for Roadway and Area Lighting Equipment – Ingress Protection (Resistance to Dust, Solid Objects and Moisture) for Luminaire Enclosures

Federal Trade Commission (FTC); Green Guides, 16 CFR Part 260; Guides for the Use of Environmental Marketing

**IEC 60529**; Degrees of protection provided by enclosures (IP Code), consolidated edition

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

**IES LM-79-08**; Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

**IES LM-80-08**; Approved Method: Measuring Lumen Maintenance of LED Lighting Sources

**IESNA TM-15-11** (revised); Luminaire Classification System for Outdoor Luminaires

RoHS (European Union Directive 2002/95/EC for Restriction of Hazardous Substances)

Title 47 of the Code of Federal Regulations (CFR), Part 15; Radio Frequency Devices

**UL 1598**; Luminaires; UL

## 4. Requirements

### 4.1 Luminaire Performance

Operating temperature, range	°C	-20 to +50
	°F	-4 to +122
Correlated Color Temperature (CCT), nominal, °K, per ANSI/NEMA/ANSI C78.377		4000 ±300
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 <sub>70</sub> ), when installed for a minimum of 50,000 hours
Light distribution per IES Handbook, chapter 22		Type II Medium
Backlight, Uplight and Glare (BUG) rating per IESNA TM-15, Addendum A		B1, 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		55
Off-state power consumption, W, maximum		0.5
On-state power consumption, excluding control device, watt, maximum		50 +/- 5
Luminous flux distribution at median driver current, lumens, minimum		3900
Effective projected area (EPA), maximum, ft <sup>2</sup>		0.9
Total harmonics distortion at full power across specified voltage range, maximum		20%
Vibration withstand, minimum, per ANSI C136.31		Level 1 (normal application)

## 4.2 Power Supply/Driver

Input voltage, functional range, 60 Hz, Vac	120 to 277
Power factor, minimum	0.90
Driver output current, mA, range	300 - 725
Surge protection <sup>1</sup>	
High exposure	10 kV
Low exposure	6 kV
Interference	FCC 47 CFR part 15/18, Class A
Dimming signal, control range, Vdc	0 to 10

References:

1. ANSI C136.37 and ANSI/IEEE C62.41.2

## 4.3 Construction

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 photocontrol receptacle.

Luminaire housing shall be cast aluminum.

Luminaire housing shall allow tool-less entry.

Luminaire housing shall be provided with level bubble to facilitate installation.

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 shall be designed to mount on a 2-inch nominal pipe size (NPS) tenon with  $\pm 5$  degrees of tilt.

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

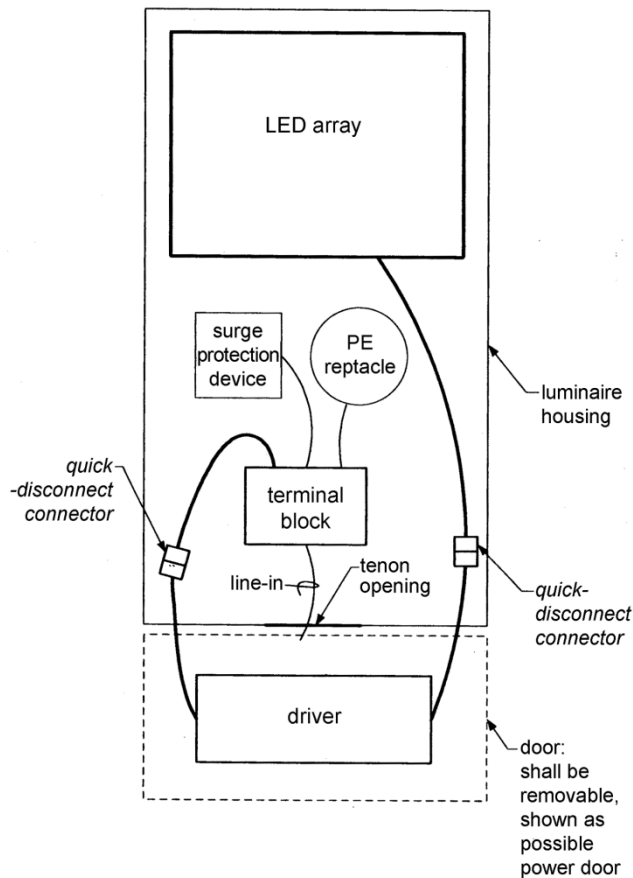
Methods of limiting tenon mounting area shall provide safe access for temporary service feeds entering directly through the tenon opening without damaging service wires.

Power supply/driver shall be field replaceable by means of quick-disconnect connectors and easy access mounting hardware.

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

Luminaire circuitry shall include *quick connect/disconnects* to allow easy separation and removal of driver and power door. Refer to Figure 4.3

**Figure 4.3. Locations of Quick Disconnect Connectors**



The 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.

Luminaire shall be designed and constructed to accept a standard plug type, locking, three-pole, three-wire, streetlight photo control.

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

All fasteners shall be stainless steel.

All polycarbonate components shall be UV stabilized.

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 be provided with capability for optional backlight control.

Backlight control shall be installed using stainless steel fasteners. Screw drive type shall be slotted or Phillips.

Complete assembly weight shall not exceed 30 lb.

Luminaire shall be RoHS (European Union Directive 2002/95/EC for Restriction of Hazardous Substances) 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)

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

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

#### **4.4 Finish**

Luminaire housing finish shall be powder-coated gray.

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

#### **4.5 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.

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### **5. 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.

#### **5.1 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 the 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.

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### **6. Design Changes**

Manufacturer shall inform Seattle City Light in writing of all design changes that could affect the product's understood or published capabilities.

## 7. Marking

### 7.1 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 hertz
- 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 the like, 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.

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## 8. Marking

### 8.1 External Marking

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

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

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

### 8.2 Barcode

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

### 8.3 Component Identification

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

## 9. 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's name
- Manufacturer's catalog number
- Product description
- Date of manufacture (month and year)
- Seattle City Light's stock number
- Seattle City Light's purchase order number.

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

Each package shall be legibly marked with:

- Product description
- Seattle City Light's stock number.

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## 10. Issuance

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## 11. Approved Manufacturers – Luminaires, Stock No. 013354

**Manufacturer:** BetaLED

**Catalog No.:** STR-LWY-2M-HT-03-D-UL-SV-R-43K-PD

*where:*

STR = product

LWY = family

2M = IESNA type II medium distribution

HT = horizontal tenon mount

03 = thirty LEDs

D = LED series

UL = voltage, universal 120-277 Vac

SV = housing color, silver

R = NEMA photocell receptacle

43K = color temperature, 4300 K

PD = power door option consisting of quick disconnect devices that allow the driver and the LEDs to be disconnected so that the door with the driver can be completely removed from the fixture if desired



**Manufacturer:** Leotek  
**Catalog No.:** GC1-30E-MV-NW-2-GY

where:

GC1 = LED streetlight  
30E = thirty Cree XPG LEDs  
MV = voltage, 120-277 Vac  
NW = nominal color temperature, 4000 K  
2 = light distribution, type 2  
GY = finish, gray

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## 12. Approved Manufacturers – Accessories

### 12.1 BetaLED Shield

**Stock No.:** 013355  
**Description:** House side shield for BetaLED, LED streetlight luminaires  
**Application:** Installed on BetaLED LED streetlight luminaires to mitigate house side backlighting problems. Streetlight Engineering must pre-approve all installations of luminaire shields. Contact Streetlight Engineering for details.  
**Manufacturer:** BetaLED  
**Catalog Number:** *by description*

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## 13. References

**SCL Material Standard 5723.51;** “Streetlight Luminaire, LED, Side-mount, Residential, 70-watt”

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## 14. Sources

**BetaLED STR-LWY-2M-HT,** LEDway Streetlight - Type II Medium, BetaLED bulletin; revision 01/27/11

**Chao, Yaochiem;** SCL Standards engineer and subject matter expert for 5723.49; (yaochiem.chao@seattle.gov)

**City of Seattle, Standard Specifications,** Section 9-31.1(2)-Luminaires

**Federal Communications Commission Title 47 CFT;** Part 15/18, revision 05/10/11; www.fcc.gov

**GE OLP-2858,** bulletin, LED Roadway; GE Lighting System, Inc.; 1/10

**IESNA Lighting Handbook;** Chapter 22,9th edition; Roadway Lighting

**IESNA Lighting Ready Reference,** A Compendium of Materials from the IESNA Lighting Handbook; 9th Edition, RR-03 Fourth Edition

**Leotek CN-022411,** LED Street Lighting, Leotek bulletin, GCA1 Series

**Seattle City Light, Specification for LED Roadway Luminaires,** revision January 4, 2012

**Shipek, John;** SCL Standards Engineer, originator and subject matter expert for 5723.49; (john.shipek@seattle.gov)

**Smalley, Edward**; SCL engineer and subject matter expert for 5723.49  
(edward.smalley@seattle.gov)

**UL 1012** - Power Units Other Than Class 2

**UL 1310** - Class 2 Power Units

**UL 2108** - Low Voltage Lighting Systems

**UL 8750** - Light-Emitting Diode (LED) Light Sources for Use in Lighting Products