

# LED ROADWAY LUMINAIRE SPECIFICATIONS

## Section 1 SCOPE

- 1.1 The intent of this specification is to establish the minimum acceptable electrical, mechanical, design, and performance requirements within which all equipment must operate satisfactorily and reliably. All items supplied shall be new and unused.
- 1.2 This specification establishes minimum standards for LED luminaire designed for use in County maintained streetlights and highway safety lights in place of traditional High Pressure Sodium (HPS) luminaires.
- 1.3 The County remains the sole judge on the ability of each device to meet specifications.

## Section 2 GENERAL

- 1.1 LED equivalents were developed to allow a one-for-one replacement of HPS luminaires with the objective that those equivalents:
  - Meet or exceed the energy savings established by the Engineer in Section 9 of these specifications.
  - Perform at a comparable level in terms of illuminance and uniformity ratio to HPS luminaires.
  - Are suitable for use at signalized intersections and roadways.
- 1.2 Luminaires shall be complete units designed for LED technology and shall not be standard luminaires retrofitted with LED lamps.
- 1.3 Luminaires shall consist of an assembly that utilizes LED's as the light source and shall consist of a housing, LED array, and electronic driver (power supply).

## Section 3 OPERATION

- 3.1 The effective life of a luminaire is expected to be a minimum of 15 years (63,000 hours), assuming nighttime operation only
- 3.2 Luminaires shall be able to operate in temperatures ranging from -20°C to 50°C.
- 3.3 LED's shall maintain a minimum of 85% of its initial lumen output after 55,000 hours of operation per TM-21-11.
- 3.4 Efficacy shall meet requirements set forth in Section 9 of this specification for the different LED equivalents.
- 3.5 Luminaires shall have a minimum Color Rendering Index (CRI) of 65.

- 3.6 Luminaires shall have a Correlated Color Temperature (CCT) of 4000K +/- 250K.
- 3.7 Distribution type shall meet requirements set forth in Section 9 of this specification for the different LED equivalents.
- 3.8 BUG Rating shall meet requirements set forth in Section 9 of this specification for the different LED equivalents.
- 3.9 The failure of individual LED's shall not result in a loss of the distribution pattern.
- 3.10 Luminaire shall avoid visible flicker to the unaided eye by maintaining the proper output frequency.

## **Section 4 ELECTRICAL**

- 4.1 Power consumption of the luminaire shall not exceed the maximum set forth in Section 9 of this specification for the different LED equivalents.
- 4.2 Operating voltage for all luminaires shall be 120V-277V.
- 4.3 Operating frequency for all luminaires shall be 60Hz.
- 4.4 Output frequency for all luminaires shall be a minimum of 120Hz.
- 4.5 Power supplies shall have a minimum power factor of 0.90.
- 4.6 Power supplies shall meet FCC 47 CFR Part 15/18 for interference.
- 4.7 Power supply shall be rated a minimum ingress protection of IP54.
- 4.8 Power Supply drive current shall have an option for field adjustable current.
- 4.9 Total Harmonic Distortion (THD) shall not exceed 20%.
- 4.10 All luminaires shall include surge protection devices (SPD) to protect it from damage and failure for transient peak currents of 10kA minimum.
- 4.11 SPD's shall be tested in accordance with IEEE C62.41.2 and ANSI standard 62.41.2.
- 4.12 Luminaire shall have 3-wire Photo Control Receptacle (PCR) in accordance with ANSI C136.10.
- 4.13 Option for ANSI 5-wire and 7-wire PCR shall be available.
- 4.14 Option for shorting caps shall be available.
- 4.15 All electrical components shall be UL approved.

## **Section 5 MECHANICAL**

- 5.1 Maximum weight of the fixtures shall meet the requirements set forth in Section 9 of this specification for all LED equivalents.
- 5.2 Housing shall be of die cast aluminum, epoxy primed with silver powder coat except for heat sink which can remain unpainted.

- 5.3 Housing shall be rated a minimum ingress protection of IP54.
- 5.4 Optical assembly shall be mounted parallel to the ground along LED's.
- 5.5 Luminaire shall mount on 2.375" horizontal tenon with universal 2-bolt slip and vertical adjustment of +/-5°.
- 5.6 Luminaire shall be cooled through the use of heat sinks that resist dirt and water build-up. No fans.
- 5.7 Access to electrical components shall not require the use of tools (tool-less entry).
- 5.8 OPTIONAL: Quick electrical disconnects shall be attached to power door.

## **Section 6 ADDITIONAL COMPLIANCE**

- 6.1 Luminaires shall be a DesignLights Consortium (DSL) qualified product.
- 6.2 Luminaire shall be listed under UL 1598 in the U.S. for wet locations.
- 6.3 Luminaire shall be RoHS Compliant.
- 6.4 Luminaire shall meet CalTrans 611 vibration testing and GR-63-CORE section 4.4.1/5.4.2 earthquake zone 4.
- 6.5 Luminaire shall be certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards.
- 6.6 Vendor shall provide independent laboratory certified iso-candela curves. Photometry must be compliant with IESNA LM-79, approved Electrical and Photometric Measurement of Solid State Street Lighting Products. The test laboratory must hold National Voluntary Laboratory Accreditation Program (NVLAP) accreditation for the IESNA LM-79 test procedure or must be qualified, verified, and recognized through the US Department of Energy's CALIPER program.
- 6.7 Manufacturers' LM-80 LED test report shall show a minimum of 10,000 hours.

## **Section 7 WARRRANTY**

- 7.1 It is the responsibility of the vendor to ensure that all equipment provided have been thoroughly tested prior to shipment and that each shipment conforms to these specifications.
- 7.2 The minimum warranty for any equipment or material shall be for a period of 10 years from the date of Agency acceptance or the date received by the Agency, whichever is later.
- 7.3 The warranty shall cover all manufacturers' defects, parts, labor, and shipping costs.

## **Section 8 TESTING \*\*\***

- 8.1 Luminaires meeting these specifications can be submitted for independent photometric testing to be performed by the Traffic and Lighting Division, Street Lighting Section.
- 8.2 Luminaires approved by Agency for photometric requirements will undergo a further "table-top" evaluation. Further evaluation will focus on, but is not limited to, visual inspection, ease of installation, aesthetics, cost and performance in high temperature climates.

**\*\*\*This Agency is currently not accepting any LED roadway luminaires for evaluation\*\*\***

## Section 9 EQUIVALENCY TABLE

Equivalent	Minimum Energy Savings	Maximum Wattage*	Minimum Efficacy	Maximum Weight	Maximum BUG Rating	Distribution Type
100W	60%	55W	75 lm/W	18 lbs	B1 U0 G1	II
150W	60%	76W	80 lm/W	22 lbs	B2 U0 G2	III**
200W	35%	156W	80 lm/W	24 lbs	B2 U0 G2	III**
250W	40%	180W	80 lm/W	28 lbs	B3 U0 G3	III**
310W	40%	219W	80 lm/W	30 lbs	B3 U2 G3	III**
400W	50%	232W	75 lm/W	30 lbs	B3 U2 G3	III**

\* Including driver

\*\* Type 2 is acceptable if Type 3 not available