

Evaluation Table

PEP ID:	XXXXX
Manufacturer:	Name of Manufacturer
Product Name:	Name of Product

736 Highway and Sign Lighting

736 Luminaire – Vertical Mount (with Shield)

ADOT Standard Specification: 736-2.01, 736-2.04

Responsible Section: Traffic Group

Product Property	Specification/ Test Method	Requirement	Results	Pass/ Fail
Vertically Mounted LED Luminaires	736-2.04	Vertically Mounted LED Luminaires shall meet the requirements of subsection 2.01 and as specified herein.		
Highway Lighting Materials: LED	736-2.01	Highway lighting materials shall be a Light Emitting Diode (LED), conforming to the requirements of this section and be the type and size specified. The LED shall have a nominal Correlated Color Temperature (CCT) equal to 3,000 degrees K \pm 300 degrees K or as specified in the project plans.		
Highway Lighting Materials: LED	736-2.01	LED Luminaires shall be listed by a National Recognized Laboratory (NTRL), as defined by the US Department of Labor. The testing laboratory must be listed by OSHA. A list of the recognized testing labs may be found on the US Department of Labor website at; http://www.osha.gov		
Highway Lighting Materials: Requirements	736-2.01(A)(1)	Shall be listed as UL 1598 and suitable for use in wet locations.		
Highway Lighting Materials: Requirements	736-2.01(A)(2) 736-2.01(E)	Shall have an (IEC)* 529, Ingress Protection (IP) of 65 or greater for the optical assemblies of the luminaire.		
Highway Lighting Materials: Requirements	736-2.01(A)(3)	Each Luminaire shall comply with the Electro Magnet Interference (EMI), as defined by FCC47 Sub Part 15; CISPR15, CISPR22 Class A (120 volt minimum), EN61000-3-2, -3-3, -4-4, -4-5.		

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Highway Lighting Materials: Requirements	736-2.01(A)(4)	Shall be tested according to the latest version of IESNA** LM-79. (Provide the Lab LM-79 test results).		
Highway Lighting Materials: Requirements	736-2.01(A)(5)	Lumen maintenance Shall be measured per IESNA** LM-80. (Provide the Lab LM-80 test results).		
Highway Lighting Materials: Requirements	736-2.01(A)(6)	Shall be documented according to IESNA** TM-21; Latest Version. (Provide the Lab TM-21 Test results).		
Highway Lighting Materials: Requirements	736-2.01(A)(7)	Shall have LM-79, LM-80, and in-situ temperature testing conducted per the US Department of Energy, Lighting Facts Program, per an Approved LED Lighting Facts, Testing Lab (Provide the Laboratory in-situ Temperature Test results).		
Highway Lighting Materials: Luminaire Housing	736-2.01(B)	Shall be made of Cast Aluminum Grade A383, A380, or A360.		
Highway Lighting Materials: Luminaire Housing	736-2.01(B)	Shall be painted gray.		
Highway Lighting Materials: Luminaire Housing	736-2.01(B)(1)	1000 hours of salt spray fog exposure per ASTM B117.		
Highway Lighting Materials: Luminaire Housing	736-2.01(B)(2)	Corrosion resistance performance test per ASTM D1654.		
Highway Lighting Materials: Luminaire Housing	736-2.01(B)	Shall be compliant (ANSI) IEEE C136.31, Table 2, Roadway Lighting Equipment-Luminaire Vibration, for both normal and bridge/overpass applications.		
Highway Lighting Materials: Luminaire Housing	736-2.01(B)	Shall have a (NEMA)*** standard decal that is visible inside the housing that states; operating voltage, wattage, current range (in milliamps), light type & be compliant with ANSI C136.15-2015.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)	The luminaire shall fully operate from -40 degrees C to 40 degrees C (-40 degrees F to 104 degrees F).		

Highway Lighting Materials: Electrical Requirements	736-2.01(C)	The LED engine is composed of the optical system, electronic driver, & heat sink, and shall have a minimum life of 100,000 hrs. at 25 degrees C and 70% of initial lumen output (L70) as calculated per TM21-11.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)	The Luminaire shall have an Integral Dimming Electronic Driver that will Operate over the following Voltages:		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(1)	120 to 240 VAC (rms) \pm 10 % at 60 Hz or the voltage option 480 VAC (rms) \pm 10 % at 60 Hz.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(2)(a)	The Electronic Driver shall have a power factor of .90 at full load.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(2)(b)	Shall have a total harmonic distortion of 20 % or less at full load per ANSI C82.77, Harmonic Emission Limits.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(2)(c)	Shall have thermal overload protection.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(2)(d)	Shall have 10 KA overload/overcurrent protection.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(2)(e)	Shall have a shielded and replaceable 20 KV surge protective device, that is compliant with ANSI C62.41 Category C.		
Highway Lighting Materials: Electrical Requirements	736-2.01(C)(2)(f)	Shall have an NRTL certified dimming driver that is terminated with quick disconnect wire harnesses. Wire nut termination is not acceptable.		
Highway Lighting Materials: LED Performance Requirements	736-2.01(D)	The luminaire shall have a minimum luminaire efficacy of 115 lumens/watt at 3,000 degrees K CCT. The luminaire shall meet the chromaticity requirement as follows:		

Highway Lighting Materials: LED Performance Requirements	736-2.01(D)(1)	The colors shall conform to the following color regions based on the 1931 CIE chromaticity diagram.		
Highway Lighting Materials: LED Performance Requirements	736-2.01(D)(1)	The luminaire shall have a minimum Color Rendering Index (CRI) of 70. The Chromaticity as stated above must be confirmed by an independent test lab or as shown on the LM 79 test report.		
Highway Lighting Materials: Warranty	736-2.01(F)	The LED unit, including auxiliary equipment shall have a factory warranty of 5 years against defects in workmanship or materials. The warranty shall cover repair or complete replacement.		
Vertically Mounted LED Luminaires	736-2.04	Vertically mounted LED luminaires shall be a pole-top-type fixture and shall be mounted with a vertical slip fitter, designed to illuminate roadways from offsets of up to 50 feet.		
Vertically Mounted LED Luminaires: Luminaire Housing	736-2.04(A)	The Luminaire housing shall have a hinged, removable door.		
Vertically Mounted LED Luminaires: Luminaire Housing	736-2.04(A)	The maximum weight for the high mast fixture when fully assembled shall not exceed 55 lbs.		
Vertically Mounted LED Luminaires: Luminaire Housing	736-2.04(A)	The Luminaire housing shall have an Effective Projected Area (EPA) of no more than 3.5 square feet when tilted at 45 degrees.		
Vertically Mounted LED Luminaires: Luminaire Housing	736-2.04(A)	The luminaire housing shall be equipped with a seven-pin, <u>Photo-Electric Control Receptacle</u> (PECR) conforming to ANSI C136.10 and shall be provided with a shorting cap.		
Vertically Mounted LED Luminaires: Luminaire Mounting	736-2.04(B)	The luminaire housing shall have a slip fitter type mounting on normal 1-1/2" (1-2/3" OD ^a) to 2-1/2" (2-7/8" OD ^a) by 5" pipe (Tenon); provided with 2 stainless or zinc plated clamps fixed with four, 2" by 3/8" zinc plated hexagonal bolts with spring washers (Outside Diameter ^a).		

Vertically Mounted LED Luminaires: Luminaire Mounting	736-2.04(B)	The slip fitter mounting shall be equipped with a swivel joint support that enables tilting the fixture from, 0 degrees to 45 degrees and supplied with a tilt angle indicator to enable correct aiming.		
Vertically Mounted LED Luminaires: Electrical Requirements	736-2.04(C)	The terminal block shall be a three-station, tunnel lug terminal board that will accommodate American Wire Gauge (AWG) #6 thru #12 wires.		
Vertically Mounted LED Luminaires: Optical Requirements	736-2.04(D)	At the horizontal position, at zero degree tilt angle, the luminaire shall have zero up light.		
Vertically Mounted LED Luminaires: Optical Requirements	736-2.04(D)	Optional shields shall be available for the luminaire upon request; the shields shall be mountable to the sides, the front and the back of the fixture.		