



U.S. Department
of Transportation
**Federal Highway
Administration**

Georgia Division

October 23, 2014

61 Forsyth Street S.W.
Suite 17T100
Atlanta, Georgia 30303
Phone 404-562-3630
Fax 404-562-3703
Georgia.fhwa@fhwa.dot.gov

In Reply Refer To:
HPE-GA

Keith Golden, P.E. Commissioner
Georgia Department of Transportation
One Georgia Center
600 West Peachtree Street, NW
Atlanta, GA 30308

Dear Commissioner Golden:

We have reviewed the request to use proprietary items for I-285/CR 209 Riverside Drive Roundabouts in the City of Sandy Springs, Fulton County, PI # 0010925.

FHWA accepts the Certification provided by the City of Sandy Springs, which states the following items are essential for the synchronization, with existing street improvement projects and aesthetic synchronization, to match the visual appearance of existing facilities previously installed in the City:

Roadway LED Lighting

Manufacturer: Phillips Lumec

Lumec Fixtures: DMS50-135W80LED4K-ES-LE3F-VOLT-GN8TX

Lumec Bracket: NM-1A-GN8TX

Lumec Pole: RSS61V-28-GN8TX

Roundabout LED Lighting

Manufacturer: Phillips Lumec

Lumec Fixtures: DMS50-70W64LED4K-ES-LE3S-120-GN8TX

Lumec Bracket: LM-1A-GN8TX

Lumec Pole: RA61U-15-GN8TX

Therefore, FHWA finds that it is acceptable to use the above listed items for the purpose of synchronization with existing facilities. This approval is only applicable for use on PI # 0010925, Fulton County. The City of Sandy Springs is responsible for ensuring that these items comply with the Buy America Act.

If you have any questions, please contact Julio A. Nuñez at (404) 562-3638.

Sincerely,



Rodney N. Barry, P.E.
Division Administrator

Cc: Brent Story, State Design Policy Engineer



October 20, 2014

Ms. Marlo L. Clowers, P.E.
Sr. Project Manager
Georgia Department of Transportation
Office of Innovative Delivery (19th Floor)
600 West Peachtree Street, NW
Atlanta, GA 30308

Subject: Use of Proprietary Items for
GDOT PI#0010925
Riverside at I-285 Roundabouts, Fulton County

Dear Ms. Clowers,

As per Federal Highway Administration regulation in 23 CFR 635.411, provides the regulatory authority for FHWA's participation in the cost of a patented or proprietary product. For the Riverside at I-285 Roundabouts, PI#0010925, I request to use the items documented in this letter based on Federal Guidance in the category of Public Interest Finding (PIF).

Riverside at I-285 Roundabouts, PI#0010925, proposes the following proprietary items for use:

Roadway LED Lighting

Manufacturer: Phillips Lumec
LUMEC Fixture: DMS50-135W80LED4K-ES-LE3F-VOLT-GN8TX
LUMEC Bracket: NM-1A-GN8TX
LUMEC Pole: RSS61V-28-GN8TX
Quantity of Lights: 19
Cost: \$106,400

Roundabout LED Lighting

Manufacturer: Phillips Lumec
LUMEC Fixture: DMS50-70W64LED4K-ES-LE3S-120-GN8TX
LUMEC Bracket: LM-1A-GN8TX
LUMEC Pole: RA61U-15-GN8TX
Quantity of Lights: 8
Cost: \$28,400

The total costs for materials listed above are estimates based on recent construction bids on similar projects. These costs include materials, labor, tax, and freight.

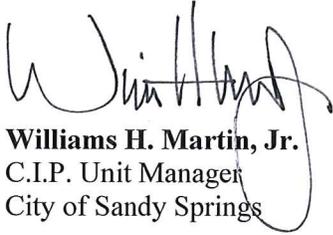
The estimated total construction cost for the project is \$4,402,207. The cost of \$134,800 for proprietary items represents 3.06% of the estimated construction costs.

I, William H. Martin, Jr., C.I.P. Unit Manager, of the City of Sandy Springs do hereby certify that in accordance with the requirements of 23 CFR 635.411(a)(2), that this patented or proprietary item is essential for synchronization with existing highway facilities. The use of these products is essential for

aesthetic synchronization to match the visual appearance of existing facilities previously installed in the City of Sandy Springs, GA and for compatibility with the City of Sandy Springs Zoning Ordinance, Article XII, Overlay Districts Guidelines.

The City of Sandy Springs requests approval for the use of these proprietary products. This is not a continuation of an earlier project.

Sincerely,

A handwritten signature in black ink, appearing to read "Williams H. Martin, Jr.", written over the typed name and title below it.

Williams H. Martin, Jr.
C.I.P. Unit Manager
City of Sandy Springs

Attachments: A: Color Photographs of Items
B: Manufacturer details lighting and posts
C: City Guidelines

PI # 0010925, Fulton County

1



D. Decorative Lighting. Pedestrian and street lights shall be installed consistent with the standards contained in Table 12B(1).3, *Decorative Lighting*, and 12B(1).1, *Cross-sections of Street and Sidewalk System Standards & Landscaping and Street Tree Standards*. Street and pedestrian lights shall be spaced forty (40) feet on-center and spaced evenly between trees. If both street lights and pedestrian lights are used, light style shall be alternated between trees.

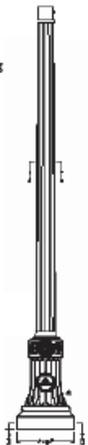
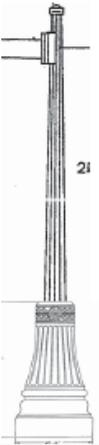
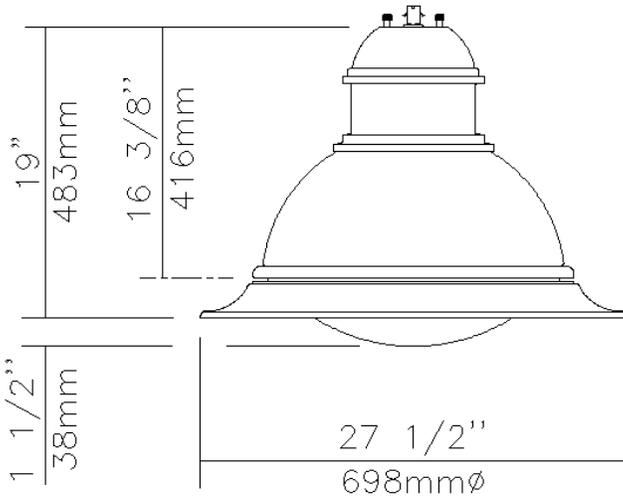
Figure 12B(1).3 Decorative Lighting			
Pedestrian Light	Street Light	Pedestrian Signal Pole	Traffic Signal Pole
	 <p>Luminaire</p> <ul style="list-style-type: none"> • 400watt • High Pressure Sodium • "Flea Grng" Optical • Roadway Fixtures • Color: Special Order C • Green • Manufacturer: King <p>Pole</p> <ul style="list-style-type: none"> • 30' Mounting Height • Hapco Aluminum Pole • Bare Unpainted • Color: Special Order C • Green • Manufacturer: Hapco 		

Figure 12B(1).3 Decorative Lighting		
<p>Luminaire</p> <ul style="list-style-type: none"> • Manufacturer: Cooper • 150 Watt • High Pressure Sodium – Cooper Generation CAN – Post Top Fixtures • Color: Special Order Dark Green <p>Pole</p> <ul style="list-style-type: none"> • Manufacturer: General Electric • Twelve (12) foot mounting height • General Electric Aluminum Poles • Haight-Ashbury Fluted Shaft • Anchor Base • Color: Special Order Dark Green 	<p>Luminaire</p> <ul style="list-style-type: none"> • Manufacturer: King • High Pressure Sodium King “Tear Drop” Decorative Roadway Fixtures • Color: Special Order Dark Green <p>Pole</p> <ul style="list-style-type: none"> • Manufacturer: Hapco • Thirty (30) foot mounting height • Hapco Aluminum Poles • Base Mounted • Color: Special Order Dark Green 	<p>Lamp Post Specifications</p> <ul style="list-style-type: none"> • Manufacturer: Spring City Elect. Mfg. Co. • SBNH16.5W-Steel • Color: Dark Green <p>Illuminated Sign</p> <ul style="list-style-type: none"> • Manufacturer: Southern Manufacturing • LED Illuminated Street Sign • 19” Height, 48”/72”/96” Width

12B(1).6. DISTRICT DESIGN GUIDELINES. In addition to the mandatory standards contained in this article, there are certain voluntary guidelines established for development in the District. These guidelines are established as follows and in the document entitled *PERIMETER Focus: Envisioning a New Urban Center*. Said document and all material therein accompany and are hereby made a part of this zoning ordinance.

A. Street Furniture. Street furniture, to include trash receptacles bus shelters, benches, bike racks, newspaper boxes, vending carts, café tables, pedestrian way finding signage, kiosks, and public art, may be installed, if desired, along Avenues only, and if installed shall be located within the five (5) foot furniture zoned. If installed street furniture shall be consistent with the standards contained in Table 12B(1).4, *Street Furniture Design Standards*.



EPA: 1.42 sq ft / weight: 42 lb (19.09 kg)

Note: 3D image may not represent color or option selected.
Logos above include link, click to access.



Qty 1 Luminaire DMS50-70W64LED4K-ES-LE3S-120-GN8TX

Description of Components:

Hood: A die cast A360.1 aluminum dome complete with a cast-in technical ring with latch and hinge. The mechanism shall offer toolfree access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.

Housing: In a round shape, this housing is made of cast 356 aluminum, c/w a watertight grommet, mechanically assembled to the bracket with four bolts 3/8-16 UNC. This suspension system permits for a full rotation of the luminaire in 90 degree increments.

Light Engine: LEDgine composed of 4 main components: **LED lamp / Optical System / Heat Sink / Driver**
Electrical components are RoHS compliant.

Lens: Made of soda-lime clear tempered glass curved lens, mechanically assembled and sealed onto the lower part of the heat sink.

Lamp: (Included), Lamp type ES, 120 lumens/watt. Composed of 64 high-performance white LEDs, 70w lamp wattage. Color temperature of 4000 Kelvin nominal, 70 CRI. Operating lifespan based on LM80 results after which 50% still emits over 70% (L70) of its original lumen output. Use of a metal core board insures greater heat transfer and longer lifespan of the light engine. The LED circuit board is included with a connector, (no connection wire required for ease of replacement).

Optical System: (LE3S), I.E.S type III (asymmetrical). Composed of high-performance acrylic refractors lenses to achieve desired distribution optimized to get maximum spacing, target lumen's and a perfect lighting uniformity. System is rated IP66. Performance shall be tested per LM63 and LM79 and TM15 (IESNA) certifying its photometric performance.

Heat Sink: Heat Sink: Made of die cast A360 aluminum optimising the LEDs efficiency and life, complete with a cast in skirt

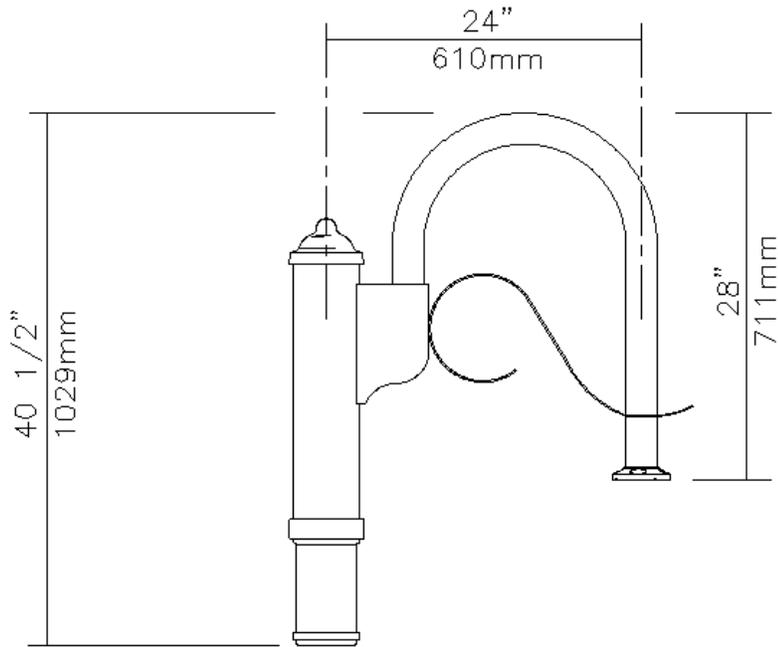
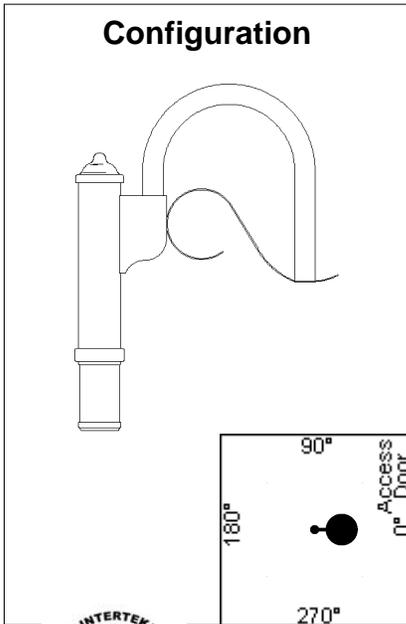
Sandy Springs, GA (Lighting Standards)

and technical ring. Product does not use any cooling device with moving parts (only passive cooling device)

Driver: High power factor of 95%. Electronic driver, operating range 50-60 Hz. **Auto-adjusting to a voltage between 120 and 277 volt AC rated for both application line to line or line to neutral, Class I**, THD of 20% max. Maximum ambient operating temperature from -40F(-40C) to 130F(55C) degrees. Certified in compliance to cULus requirement. Weather tightness rating IP66. Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221F(105C) degrees.

The current supplying the LEDs will be reduced by the driver if the internal temperature exceeds 176F(80C), as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction.

Surge Protector: LED Driver 3 poles 10KV surge Protectors that protect Line-Ground, Line-Neutral, and Neutral-Ground in accordance with IEEE / ANSI C62.41.2 guidelines.



Qty 1 Bracket LM-1A-GN8TX

Description of Components:

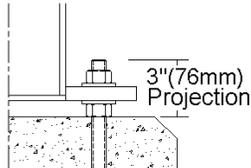
Arm: Shall be made from bent 6061-T6 aluminum tubing, 2 3/8" (60mm) outside diameter, welded.

Decorative Element: Scroll made of bent aluminium, welded to the arm.

Central Adaptor: Made of aluminum 6061-T6, 5" (127mm) outside diameter. Complete with a cast 356 aluminum fitter that slip-fits 9" (229mm) over a 4" (102mm) outside diameter pole tenon. Mechanically assembled using two sets of four set screws at 90 degrees around the bracket.

Sandy Springs, GA (Lighting Standards)

Base & Bolts Information



3"(76mm) Projection

Comes with 4 steel anchor bolts, 3/4" X 17" + 3", 8 nuts and 8 washers. Important: Do not obstruct space between anchor plate and concrete base.

Anchor Plate

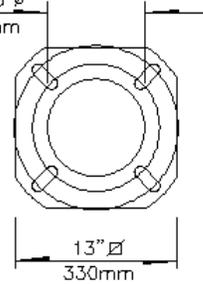
8 1/8" ϕ / 206mm

Free opening

-B.C.: 12 1/2" (318mm)

- Material: Cast Aluminum

- NOTE: Bolt Circle Allowed: 11" to 13" / 279mm to 330mm



13" ϕ / 330mm



Qty	1	Pole	RA61U-15-GN8TX
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Description of Components:

Pole Shaft: Shall be made from a 4" (102mm) round extruded 6061-T6 aluminum tubing, having a 0.226" (5.7mm) wall thickness, welded to the pole base.

Joint Cover: Two-piece round joint cover made from cast 356 aluminum, mechanically fastened with stainless steel screws.

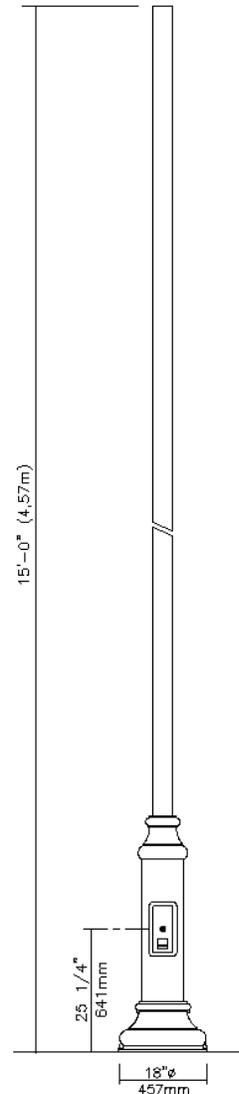
Pole Base: Shall be made from a 8 5/8" (219mm) round extruded 6061-T6 aluminum tubing base having a 0.148" (4.8mm) wall thickness, welded to both the bottom and top of the anchor plate.

Maintenance Opening: The pole shall have a 4 1/2" x 10" (114mm x 254mm) maintenance opening centered 25 1/4" (641mm) from the bottom of the anchor plate, complete with a weatherproof embossed aluminum cover and a copper ground lug.

Base Cover: Two piece round base cover made from cast 356 aluminum, mechanically fastened with stainless steel screws.

Note: A tenon will be provided when the luminaire or bracket does not fit directly on pole shaft. Tenon not shown on the drawing.

IMPORTANT: Philips Lumec strongly recommends the installation of the complete lighting assembly with all of its accessories upon the anchoring of the pole. This will ensure that the structural integrity of the product is maintained throughout its lifetime.



Miscellaneous

Description of Components:

Wiring: Gauge (#14) TEW/AWM 1015 or 1230 wires, 6" (152mm) minimum exceeding top of the bracket.

Hardware: All exposed screws shall be stainless steel with Ceramic primer-seal basecoat to reduce seizing of the parts. All seals and sealing devices are made and/or lined with EPDM and/or silicone.

Finish: Color to be **dark forest green textured (GN8TX)**. Application of a polyester powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance to the ASTM-B117-73 standard and humidity proof in accordance to the ASTM-D2247-68 standard.

Quality Control: The manufacturer must provide a written confirmation of its ISO 9001-2008 and ISO 14001-2004 International Quality Standards Certification.

Mechanical resistance: In order to ensure the mechanical resistance of the poles, the projected area should be calculated according to AASHTO 2001.

Web site information details: Click on any specific information details you need:

[Paint finish](#) / [Warranties](#) / [Installation pictures](#) / [ISO 9001-2008 Certification](#) / [ISO 14001-2004 Certification](#)

Lamp Technical Information (LEDgine)									
Lamps #	Rated life hrs. ¹	LED Manufacturer	CRI	Color Temperature ²	Initial Lumens	Wattage		Max System AC current: 120v	LED mA
						Lamp	System ³		
35W32LED4KES	100,000	Philips Lumileds Rebel ES	70	4000K	3872	35W	40	0.36A	350mA
42W32LED4KES	100,000		70	4000K	4576	42W	45	0.42A	400mA
55W32LED4KES	100,000		70	4000K	5632	55W	60	0.54A	530mA
55W48LED4KES	100,000		70	4000K	5808	55W	60	0.54A	350mA
65W48LED4KES	100,000		70	4000K	6864	65W	72	0.63A	400mA
80W48LED4KES	100,000		70	4000K	8448	80W	88	0.82A	530mA
70W64LED4KES	100,000		70	4000K	7744	70W	77	0.72A	350mA
85W64LED4KES	100,000		70	4000K	9152	80W	94	0.84A	400mA
110W64LED4KES	100,000		70	4000K	11264	110W	120	1.09A	530mA
90W80LED4KES	100,000		70	4000K	9680	90W	100	0.90A	350mA
105W80LED4KES	100,000		70	4000K	11440	110W	115	1.05A	400mA
135W80LED4KES	100,000		70	4000K	14080	135W	150	1.36A	530mA

¹ Rated life represents the time it takes for the LED system to reach 70% of initial lumen output (as described in LM-80)
² On average.
³ System wattage includes the lamp and the LED driver.

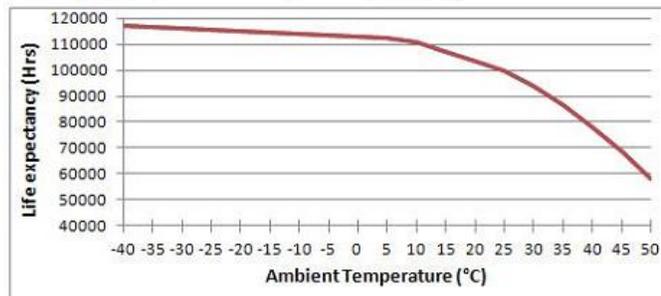
Ambient (°C)	-55	-35	-15	5	25	45	65
% Flux	104.8	104.5	103.5	101.8	98	91.5	83

Photometric tests are done at 25°C ambient (as requested by LM-79)
 If our product is used at a different ambient temperature, you can multiply the lumens by the percentage above

CCT (K)	6000	4000	3000
% Flux	100.00	100.00	68.18

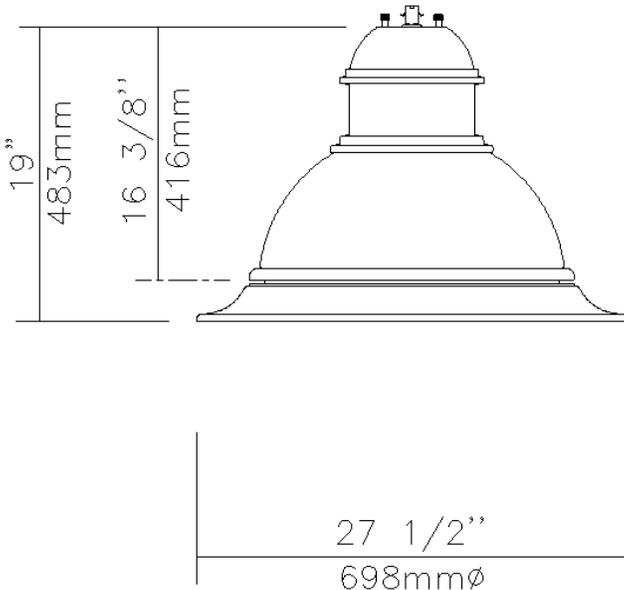
As 4000K is our standard, photometric tests are only done with this CCT
 Light output of 6000K is the same as 4000K (With Lumileds Rebel)
 If you want to use another CCT (6000K or 3000K) you can multiply the lumens by the percentage above

Life expectancy vs ambient temperature (at 530 mA)



Note : Due to rapid and continuous advances in LED technology, LED luminaire data is subject to change without notice and at the discretion of Philips.

Specification



EPA: 1.42 sq ft / weight: 42 lb (19.09 kg)

Note: 3D image may not represent color or option selected.
Logos above include link, click to access.



Qty 1 Luminaire DMS50-135W80LED4K-ES-LE3F-VOLT-GN8TX

Description of Components:

Hood: A die cast A360.1 aluminum dome complete with a cast-in technical ring with latch and hinge. The mechanism shall offer toolfree access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.

Housing: In a round shape, this housing is made of cast 356 aluminum, c/w a watertight grommet, mechanically assembled to the bracket with four bolts 3/8-16 UNC. This suspension system permits for a full rotation of the luminaire in 90 degree increments.

Light Engine: LEDgine composed of 4 main components: **LED lamp / Optical System / Heat Sink / Driver**
Electrical components are RoHS compliant.

Lens: Made of soda-lime clear tempered glass lens, mechanically assembled and sealed onto the lower part of the heat sink.

Lamp: (Included), Lamp type Philips Lumileds Rebel ES. Composed of 80 high-performance white LEDs, 135w lamp wattage. Color temperature of 4000 Kelvin nominal, 70 CRI. Operating lifespan based on LM80 results after which 50% still emits over 70% (L70) of its original lumen output. Use of a metal core board insures greater heat transfer and longer lifespan of the light engine. The LED circuit board is included with a connector, (no connection wire required for ease of replacement).

Optical System: (LE3F), I.E.S type III (asymmetrical). Composed of high-performance acrylic refractors lenses to achieve desired distribution optimized to get maximum spacing, target lumen's and a perfect lighting uniformity. System is rated IP66. Performance shall be tested per LM63 and LM79 and TM15 (IESNA) certifying its photometric performance.

Specification

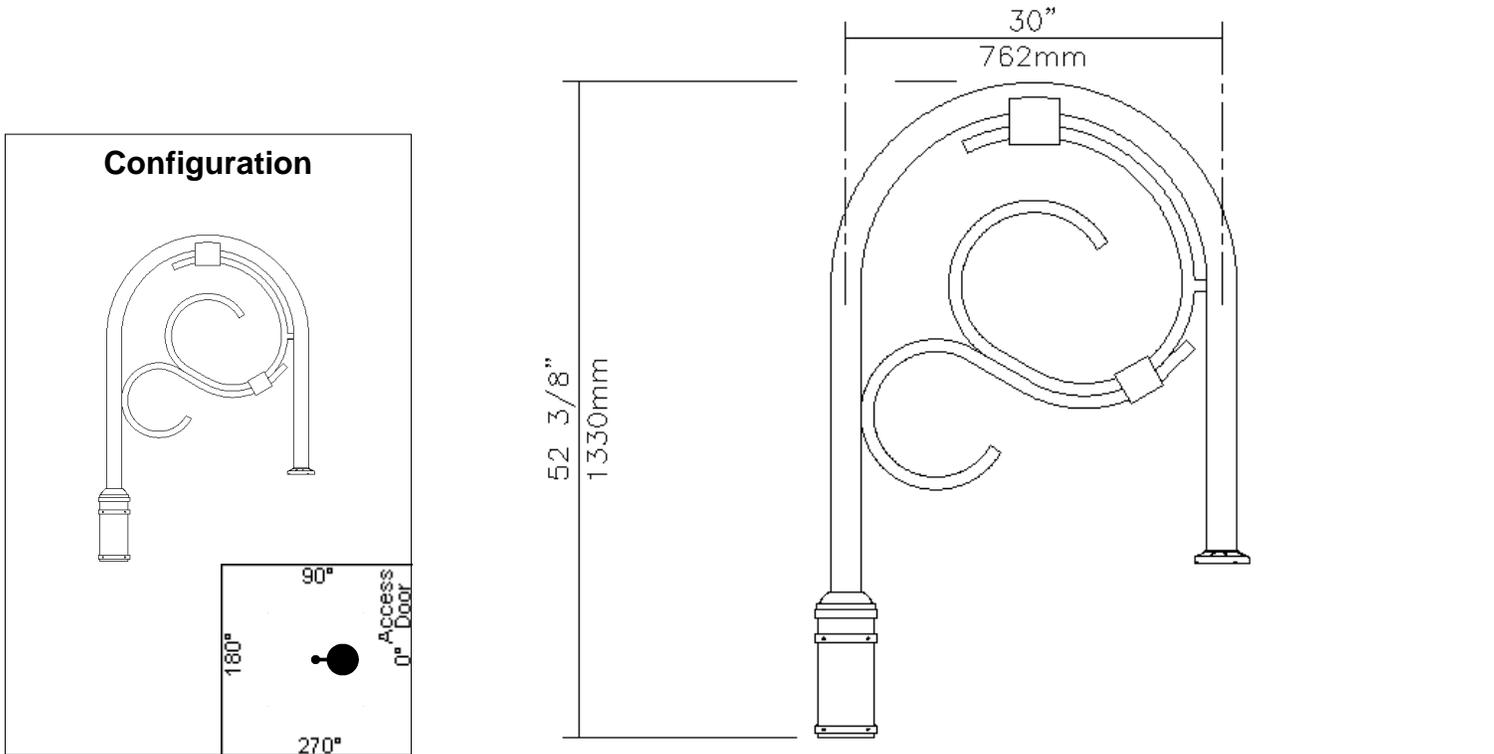
Heat Sink: Heat Sink: Made of die cast A360 aluminum optimising the LEDs efficiency and life, complete with a cast in skirt and technical ring. Product does not use any cooling device with moving parts (only passive cooling device)

Driver: High power factor of 95%. Electronic driver, operating range 50-60 Hz. **Auto-adjusting to a voltage between 120 and 277 volt AC rated for both application line to line or line to neutral, Class I**, THD of 20% max. Maximum ambient operating temperature from -40F(-40C) to 130F(55C) degrees. Certified in compliance to cULus requirement. Dry and damp location. Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221F(105C) degrees.

The current supplying the LEDs will be reduced by the driver if the internal temperature exceeds 176F(80C), as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction.

Surge Protector: LED Driver 3 poles 10KV surge Protectors that protect Line-Ground, Line-Neutral, and Neutral-Ground in accordance with IEEE / ANSI C62.41.2 guidelines.

Specification



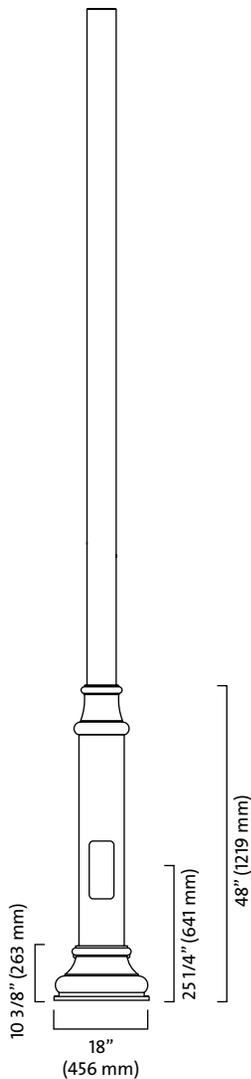
	Qty	1	Bracket	NM-1A-GN8TX
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Description of Components:

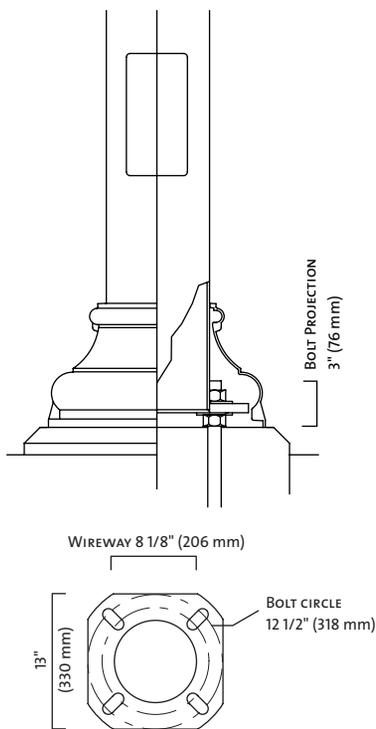
Arm: Shall be made from bent 6061-T6 aluminum tubing, 2 3/8" (60mm) outside diameter, welded.

Decorative Element: Made of cast 356 aluminum, welded.

Adaptor: Made of cast 356 aluminum. **Slip-fits on a 4" (102mm) outside diameter x 9" (229mm) long tenon.** Mechanically fastened by two sets of four set-screws at 90 degrees around the bracket.



Base details



Comes with 4 anchor bolts,
8 nuts and 8 washers.
B.C. from: 11" to 13" (279 to 330 mm)

Specifications:

Pole: made from a one-piece, seamless 5 9/16" round (141 mm) high-tensile carbon steel shaft sealed by a rolled and flattened vertical weld seam and welded over and in an 8 5/8" round (219 mm) high-tensile carbon-steel pole base.

The assembly is welded to both the top and bottom of a steel anchor plate.

A 4 1/2" by 10" (114 by 254 mm) maintenance opening is complete with cover and copper ground lug.

Joint cover: made from two pieces of cast aluminum mechanically fastened to the junction with stainless steel hardware.

Base cover: decorative base cover made from cast-aluminum pieces mechanically assembled together with stainless steel hardware around base of the pole.

Finish: See page 142 for Finish details.

Options:

- DE:** Pole buried 5' (1524 mm) in the ground (see page 133)
- LS:** Provision for loudspeaker outlet (see page 132)
- PH7:** Button-type photoelectric cell (specify operating voltage)
- PH8:** Quarter-turn type photoelectric cell (specify operating voltage)
- DR:** Duplex receptacle (120V line voltage only)
- GFI:** DR with common ground fault interrupter (120V line voltage only)
- BA:** Banner arm (see page 136)
- PS:** Plant support (see page 137)
- MPL:** Mid-pole luminaire

Note: The recommended method for calculating EPA (Effective Projected Area) is in accordance with AASHTO 2001 standards: for three seconds, the pole is tested in wind gusts equivalent to the strongest winds on record over the past 50 years, and with a 50 pound load (22.7 kg) placed at 1 foot (305 mm) above its center.

CATALOG NUMBER	NOMINAL HEIGHT		TENON SECTION		WALL THICKNESS		WEIGHT		EPA RATING				ANCHOR BOLTS	
	ft	m	in	mm	in	mm	lbs	kg	90 MPH	110 MPH	120 MPH	150 MPH	in	mm
RSS61V-18	18	5.49	5 9/16	141	0.250	6.4	258	117	30	30	30	21.2	1-36	25-914
RSS61V-20	20	6.10	5 9/16	141	0.250	6.4	287	130	30	30	27.43	17.66	1-36	25-914
RSS61V-22	22	6.71	5 9/16	141	0.250	6.4	315	143	30	27.47	23.19	14.88	1-36	25-914
RSS61V-24	24	7.32	5 9/16	141	0.250	6.4	344	156	30	23.4	19.73	12.62	1-36	25-914
RSS61V-26	26	7.93	5 9/16	141	0.250	6.4	372	156	29.46	20.04	16.88	10.73	1-36	25-914
RSS61V-28	28	8.54	5 9/16	141	0.250	6.4	400	182	25.36	17.19	14.44	9.13	1-36	25-914

Note: Philips Lumec reserves the right to modify the above details to reflect changes in the cost of materials and/or production and/or design without prior notice.

Specification

Miscellaneous

Description of Components:

Wiring: Gauge (#14) TEW/AWM 1015 or 1230 wires, 6" (152mm) minimum exceeding the bracket.

Hardware: All exposed screws shall be stainless steel with Ceramic primer-seal basecoat to reduce seizing of the parts. All seals and sealing devices are made and/or lined with EPDM and/or silicone.

Finish: Color to be **dark forest green textured (GN8TX)** and in accordance with the AAMA 2603 standard. Application of a polyester power coat paint (4 mils/100 microns) with ± 1 mils/24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D 2244 standard, as well as luster retention in keeping with the ASTM D 523 standard and humidity proof in accordance with the ASTM-D2247 standard.

The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with the tests performed and the ASTM-B117 standard.

Note: *IMPORTANT: All missing details must be clearly specified on the return of these approval drawings. Thank you for your cooperation.*

VOLTAGE: _____

Pole Information: This bracket is **available for a 4"(102mm), 5"(127mm) or 5 9/16" (141mm) Outside Diameter** pole or tenon.

Please specify **diameter required:** _____

LED products manufacturing standard: The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340-5-1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Quality Control: The manufacturer must provide a written confirmation of its ISO 9001-2008 and ISO 14001-2004 International Quality Standards Certification.

Web site information details: Click on any specific information details you need:

[Paint finish](#) / [Warranties](#) / [Installation pictures](#) / [ISO 9001-2008 Certification](#) / [ISO 14001-2004 Certification](#)

Specification

Lamp technical information for DMS50 DMS55										
LED = Philips Lumileds Rebel ES, CRI = 70, CCT = 4000K (+/- 350K)										
System (LED + driver) rated life = 100,000 hrs ¹										
Lamp	Typical delivered lumens ²		Typical lamp wattage (W)	Typical system wattage ³ (W)	Typical current @ 120 V (A)	Typical current @ 240 V (A)	Typical current @ 277 V (A)	LED current (mA)	HPS equivalent ⁴	Luminaire Efficacy Rating (Lm/W)
	Flat lens	Sag lens								
70W64LED4K-ES	6470	6680	70	86	0.72	0.36	0.31	350	100 W	78
110W64LED4K-ES	9170	9460	110	135	1.13	0.56	0.49	530	200 W	70
90W80LED4K-ES	8200	8450	90	95	0.79	0.40	0.34	350	150 W	89
135W80LED4K-ES	11600	12000	135	138	1.15	0.58	0.50	530	250 W	87

¹ L70 = 100,000 hrs (at ambient temperature = 25°C and forward current = 700 mA)
² May vary depending on the optical distribution used
³ System wattage includes the lamp and the LED driver.
⁴ Compared to Domus (equivalence should always be confirmed by a photometric layout)

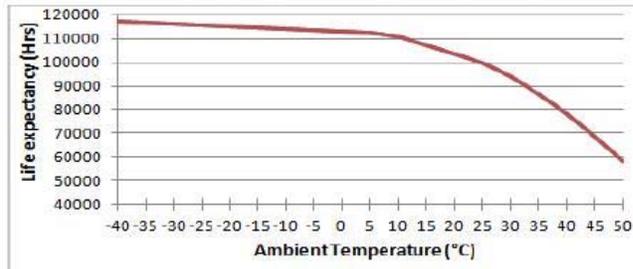
Photometric tests are done at 25°C ambient (as requested by LM-79). If our product is used at a different ambient temperature (nighttime average), you can multiply the lumens by the percentage below.

Ambient (°C)	-20	-10	0	5	10	15	20	25
% Flux	105.8	105.1	104.2	103.8	102.8	101.9	101	100

As 4000K is our standard, photometric tests are only done with this CCT. If you want to use another CCT (6000K or 3000K) you can multiply the lumens by the percentage below.

CCT (K)	6000	4000	3000
% Flux	100	100	59.28

Life expectancy vs ambient temperature (@ 700 mA)



Note: Due to rapid and continuous advances in LED technology, LED luminaire data is subject to change without notice and at the discretion of Philips.