



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

Georgia Division

November 8, 2016

61 Forsyth Street S.W.
Suite 17T100
Atlanta, Georgia 30303
Phone 404-562-3630
Fax 404-562-3450
Georgia.fhwa@fhwa.dot.gov

In Reply Refer To:
HPE-GA

Russell R. McMurry, P.E., Commissioner
Georgia Department of Transportation
One Georgia Center
600 West Peachtree Street, NW
Atlanta, GA 30308

Dear Commissioner McMurry:

We have reviewed the request to use proprietary items on PI# 311000-, 0012700, and 311410-, I-16 at I-75 Interchange Reconstruction projects in Macon-Bibb County.

FHWA concurs with the use of the described items below as proprietary items for aesthetic synchronization. This public interest finding is only applicable for the lighting items listed below. Furthermore, this public interest finding is only applicable for use on PI # 311000-, 0012700, and 311410-. GDOT is responsible for ensuring that these items comply with the Buy America Act:

- Post top acorn light fixtures – Philips Lumec, Serenade Series with Smart Control Receptacle, Black
- Tear drop light fixtures – Philips Lumec, Renaissance Series with Smart Control Receptacle, Black
- Roadway light fixtures – Philips Lumec, RoadFocus Large Series with Smart Control Receptacle, Gray
- Roadway light fixtures – Philips Lumec, RoadFocus Medium Series with Smart Control Receptacle, Gray

If you have any questions, please contact Kendra Fly at (404) 562-3644.

Sincerely,

 Rodney N. Barry, P.E.
Division Administrator

Cc: Albert Shelby, State Program Delivery Engineer
Cc: Brent Story, State Design Policy Engineer

Russell McMurry, P.E., Commissioner



GEORGIA DEPARTMENT OF TRANSPORTATION

One Georgia Center, 600 West Peachtree Street, NW
Atlanta, Georgia 30308
Telephone: (404) 631-1000

November 3, 2016

Mr. Rodney Barry – Division Administration
Federal Highway Administration
61 Forsyth Street, Suite 17T100
Atlanta, GA 30277
Attention: Melinda Roberson

Subject: Request for Proprietary Items Usage
PI # 311000-, 0012700, & 311410-
I-16 @ I-75 Interchange Reconstruction
Macon-Bibb County

Mr. Barry:

Please review the attached request from Macon-Bibb County for the use of proprietary lighting items along the I-16 @ I-75 Reconstruction projects, P.I. Numbers 311000-, 0012700, and 311410-.

Macon-Bibb County has certified that the requested items are essential for synchronization with previously installed items and are necessary for compatibility with Macon-Bibb County Design Guidelines. In order to ensure aesthetic continuity within its downtown area and comply with Macon-Bibb County Design Guidelines, Macon-Bibb County respectfully requests approval to utilize the requested lighting items.

The Department considers the use of the proposed proprietary items to be in compliance with 23 CFR 635.411 for aesthetic synchronization.

Should you have any questions or concerns, please contact Dave Peters at 404-631-1738 or Clinton Ford at 678-343-0929.

Sincerely,

A handwritten signature in blue ink, appearing to read "Brent Story".

for Brent Story, P.E.
State Design Policy Engineer

BAS:drp



ROBERT A.B. REICHERT
MAYOR

OFFICE OF THE MAYOR

Macon-Bibb County

700 POPLAR STREET
P.O. BOX 247
MACON, GEORGIA 31202-0247
(478) 751-7170
FAX (478) 751-7931

October 12, 2016

Mr. Clinton Ford
Project Manager
Georgia Department of Transportation
One Georgia Center
600 West Peachtree NW
Atlanta, Georgia 30308

RE: Request for Use of Proprietary Items
I-16/ I-75 Interchange Improvements, Macon-Bibb County
PHASE 1 - GDOT PI NO.: 311000
PHASE 2 – GDOT PI NO.: 0012700
PHASE 3 – GDOT PI NO.: 311410

Dear Mr. Ford,

As per Federal Highway Administration regulation in 23 CFR 635.411(a) 2, proprietary materials, specifications, and processes can be used if their use is essential for synchronization with existing highway facilities. For Macon-Bibb County's Transportation Enhancement Project, I-16 and I-75 Interchange Improvements Phase #1, 2, &3, the following proprietary items are proposed for use:

Post top acorn light Fixtures
Manufacturer: PHILIPS LUMEC
Style: Serenade Series with Smart Control Receptacle
Part Number: S56-80W48LED4K-R-GL-LE3-VOLT-DMG-SFX-BC-FN10-[RCD7-006]-BKTX
Color: Black
Quantity in Project: 151
Total Estimated Cost for Pedestrian Light Fixtures: \$2,200 each = \$332,200

Tear drop Light Fixtures

Manufacturer: PHILIPS LUMEC

Style: Renaissance Series with Smart Control Receptacle

Part Number: RN20-135W80LED4K-R-GL-LE3R-480-DMG-SMB-PH9-RCD7-BKTX

Color: Black

Quantity in Project: 24

Total Estimated Cost for Pedestrian Tear Drop Light Fixtures: \$2,300 each = \$55,200

Roadway Light Fixtures

Manufacturer: PHILIPS LUMEC

Style: RoadFocus Large Series with Smart Control Receptacle

Part Number: RFL_241W112LED4K-T_R3S or R2S_HVU_DMG_RCD7_PH9_GY3

Color: Gray

Quantity in Project: 213

Total Estimated Cost for Roadway Light Fixtures: \$650 each = \$138,450

Roadway Light Fixtures

Manufacturer: PHILIPS LUMEC

Style: RoadFocus Medium Series with Smart Control Receptacle

Part Number: RFM_108W48LED4K-T_R3S or R2S_HVU_DMG_RCD7_PH9_GY3

Color: Gray

Quantity in Project: 20

Total Estimated Cost for Roadway Light Fixtures: \$360 each = \$7,200

Rob Ryals, Director of Facilities Management for Macon-Bibb County Government, certifies that in accordance with the requirements of 23 CFR 635.411(a)(2), that these proprietary items are essential for synchronization and standardization 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 and for compatibility with Macon-Bibb County Design Guidelines.

Macon-Bibb County Government respectfully requests that the use of these proprietary products be approved.

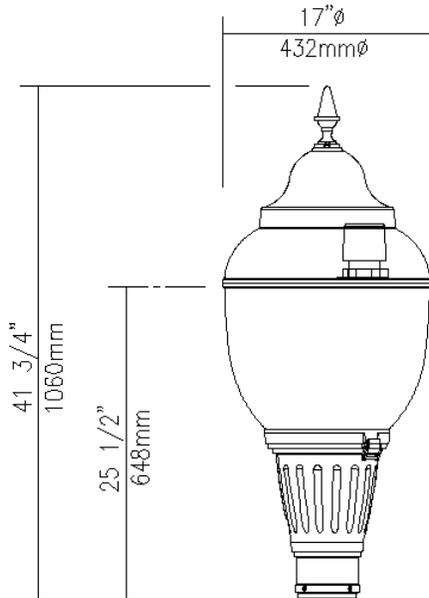
Respectively,



Robert A.B. Reichert, Mayor
Macon-Bibb County

Attachments:

- A. Manufacture details of the proposed lighting fixtures



EPA: 2.17 sq ft / weight: 60 lb (27.3 kg)
Note: 3D image may not represent color or option selected.
Logos above include link, click to access.

Qty	1	Luminaire S56-80W48LED4K-R-GL-LE3-UNIV-DMG-SFX-[API-014]-BC-FN10-[RCD7-006]-BKTX
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Description of Components:

Finial: Decorative cast 356 aluminum, mechanically assembled.

Hood: (GL), One-piece, seamless, pressure-molded colorless borosilicate glass globe having internal prisms with smooth external self-cleaning surface, permanently assembled to the globe.

Access-Mechanism: A cast A360.1 aluminum technical ring with latch and hinge. The mechanism shall offer tool-free access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofness.

Heat Sink: Made of cast aluminum optimising the LEDs efficiency and life. Product does not use any cooling device with moving parts (only passive cooling device).

Globe: (GL), One-piece, seamless, pressure-molded colorless borosilicate glass globe having internal glare softening prisms with smooth external self-cleaning surface. The globe is permanently sealed onto the access-mechanism.

LED Module: LED type Philips Lumileds LUXEON R. Composed of 48 high-performance white LEDs. Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K), CRI 70 Min. 75 Typical.

Optical System: (LE3), IES type III (asymmetrical). Composed of high-performance optical grade PMMA acrylic refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Optical system is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. Street side indicated.

Driver: High power factor of 90% minimum. Electronic driver, operating range 50/60 Hz. **Auto-adjusting universal voltage input from 120 to 277 VAC 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.

The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating 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. Standard built-in driver surge protection of 2.5kV (min).

Driver Options: (DMG), Dimming compatible 0-10 volts. For applicable warranty, certification and operation guide see "*Philips Lumec dimmable luminaire specification document for unapproved device installed by other*". To get document, click on this link: [Specification document](#) or go on web site on this address: [http://www.lumec.com/Lumec3DV2/PdfWebLink/Philips Lumec dimmable luminaire specification document for unapproved device installed by other.pdf](http://www.lumec.com/Lumec3DV2/PdfWebLink/Philips%20Lumec%20dimmable%20luminaire%20specification%20document%20for%20unapproved%20device%20installed%20by%20other.pdf)

Surge Protector: Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid-State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA.

Fitter: Cast aluminum A360.1 c/w 4 set screws 3/8-16 UNC. Fits on a 4"(102mm) outside diameter by 4"(102mm) long tenon.

Luminaire Options: [API-014], ANSI label 1" x 1" to identify system wattage and LED source. Placed on the fitter of the luminaire, visible from the ground. (BC), Block Connector.

[RCD7-006], Receptacle with 7 pins, connected to be used with Citytouch node.

LED light engine technical information for S55 S56 S55C1 S56C1 S55C2 S56C2

LED = Philips Lumileds Luxeon R, CRI = 70, CCT = 4000K (+/- 350K)

System (LED + driver) rated life = 100,000 hrs¹

Lamp	Typical delivered lumens	Typical system wattage ² (W)	Typical current @ 120 V (A)	Typical current @ 208 V (A)	Typical current @ 240 V (A)	Typical current @ 277 V (A)	LED current (mA)	HID equivalent ³	Luminaire Efficacy Rating (Lm/W)	BUG rating
35W32LED4K-R-LE2	3468	36	0.29	0.17	0.16	0.15	350	70 -100	96.3	B1-U2-G1
35W32LED4K-R-LE3	3439	36	0.29	0.17	0.16	0.15	350	70 -100	95.5	B1-U2-G2
35W32LED4K-R-LE4	3520	36	0.29	0.17	0.16	0.15	350	70 -100	97.8	B1-U2-G1
35W32LED4K-R-LE5	3694	36	0.29	0.17	0.16	0.15	350	70 -100	102.6	B3-U2-G1
55W32LED4K-R-LE2	4916	53	0.40	0.23	0.21	0.19	530	100 - 150	92.8	B1-U3-G1
55W32LED4K-R-LE3	4880	53	0.40	0.23	0.21	0.19	530	100 - 150	92.1	B1-U3-G2
55W32LED4K-R-LE4	4984	53	0.40	0.23	0.21	0.19	530	100 - 150	94.0	B1-U3-G2
55W32LED4K-R-LE5	5232	53	0.40	0.23	0.21	0.19	530	100 - 150	98.7	B3-U3-G1
55W48LED4K-R-LE2	5105	55	0.38	0.22	0.23	0.21	350	100 - 150	92.8	B2-U3-G2
55W48LED4K-R-LE3	5064	55	0.38	0.22	0.23	0.21	350	100 - 150	92.1	B2-U3-G2
55W48LED4K-R-LE4	5172	55	0.38	0.22	0.23	0.21	350	100 - 150	94.0	B1-U3-G2
55W48LED4K-R-LE5	5429	55	0.38	0.22	0.23	0.21	350	100 - 150	98.7	B3-U3-G1
80W48LED4K-R-LE2	7192	79	0.63	0.36	0.34	0.31	530	150 - 175	91.0	B2-U3-G2
80W48LED4K-R-LE3	7132	79	0.63	0.36	0.34	0.31	530	150 - 175	90.3	B2-U3-G2
80W48LED4K-R-LE4	7287	79	0.63	0.36	0.34	0.31	530	150 - 175	92.2	B2-U3-G2
80W48LED4K-R-LE5	7649	79	0.63	0.36	0.34	0.31	530	150 - 175	96.8	B3-U3-G2

¹ L70 = 100,000 hrs (at ambient temperature = 25°C)

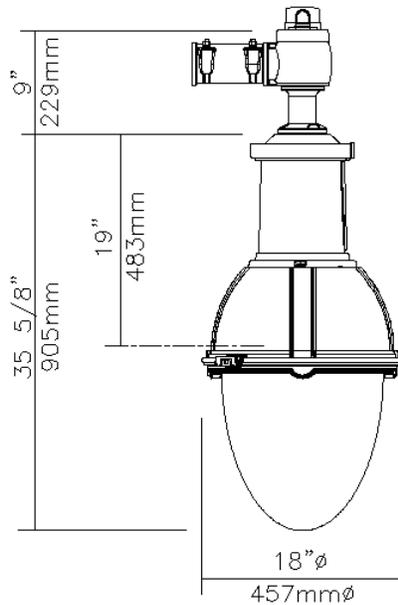
² System wattage includes the lamp and the LED driver.

³ Equivalence should always be confirmed by a photometric layout

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.



LEDGINE



EPA: 2.63 sq ft / weight: 75 lb (34.1 kg)
Note: 3D image may not represent color or option selected.
Logos above include link, click to access.

Qty	1	Luminaire	RN20-135W80LED4K-R-GL-LE3R-480-DMG-SMB-PH9-RCD7-BKTX
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Description of Components:

Hood: Injection die cast A360.1 aluminium dome, mechanically assembled on the luminaire housing.

Housing: In a round shape, this housing is made of injection die cast A360.1 aluminium, complete with a weatherproof door giving a tool-free access to the ballast, without disconnection of wiring, mechanically assembled. This suspension system permits a full rotation of the luminaire in 90 degree increments.

Access-Mechanism: Injection die cast A360.1 aluminium frame with latch and hinge, complete with cast-in security block for frame's open position. The mechanism shall offer tool-free access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.

Light Engine: LEDgine composed of 5 main components: **Globe / LED Module / Optical System / Heat Sink / Driver**
Electrical components are RoHS compliant.

Heat Sink: Made of cast aluminum optimising the LEDs efficiency and life. Product does not use any cooling device with moving parts (only passive cooling device).

Globe: (GL), Made of one-piece seamless injection-molded clear borosilicate glass globe having an inner prismatic surface. Complete with a semi-prismatic house side shield and external glare softening prisms. The globe is mechanically assembled and sealed onto the lower part of the heat sink.

LED Module: LED type Philips Lumileds LUXEON R. Composed of 80 high-performance white LEDs. Color temperature as per ANSI/NEMA bin Neutral White, 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K), CRI 70 Min. 75 Typical.

Optical System: (LE3R), IES type III (asymmetrical). Composed of high-performance optical grade PMMA acrylic refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Optical system is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. Street side indicated.

Driver: High power factor of 90% minimum. Electronic driver, operating range 50/60 Hz. **Auto adjusting universal voltage input from 347 to 480 VAC 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.

The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating 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. Standard built-in driver surge protection of 2.5kV (min).

Driver Options: (DMG), Dimming compatible 0-10 volts. For applicable warranty, certification and operation guide see "*Philips Lumec dimmable luminaire specification document for unapproved device installed by other*". To get document, click on this link: [Specification document](#) or go on web site on this address: [http://www.lumec.com/Lumec3DV2/PdfWebLink/Philips Lumec dimmable luminaire specification document for unapproved device installed by other.pdf](http://www.lumec.com/Lumec3DV2/PdfWebLink/Philips%20Lumec%20dimmable%20luminaire%20specification%20document%20for%20unapproved%20device%20installed%20by%20other.pdf)

Surge Protector: Surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid-State Street Lighting Consortium) model specification for LED roadway luminaires electrical immunity requirements for High Test Level 10kV / 10kA.

Adaptor: (SMB), Made of cast 356 aluminum, complete with a block connector, mechanically assembled to the bracket. Can be mounted on a 1.66"(42mm) to 2.38"(60mm) outside diameter bracket arm tubing that slip fits 6.5" (165mm) long inside the adaptor, permits an adjustment of $\pm 5^\circ$.

Luminaire Options: (PH9), Shorting Cap c/w receptacle **(RCD7)**, Receptacle with 7 pins enabling dimming and with two extra connections for future use (these connections are capped off at the factory - requires connections to be made in the field), can be used with a twist-lock control device or photoelectric cell or a shorting cap. Use of photocell or shorting cap is required to ensure proper illumination.

LED light engine technical information for RN20 RN30 with prismatic globe

LED = Philips Lumileds Luxeon R, CRI = 75, CCT = 4000K (+/- 350K)

System (LED + driver) rated life = 100,000 hrs¹

Lamp	Typical delivered lumens	Typical system wattage ² (W)	Typical current @ 120 V (A)	Typical current @ 208 V (A)	Typical current @ 240 V (A)	Typical current @ 277 V (A)	Typical current @ 347 V (A)	Typical current @ 480 V (A)	LED current (mA)	HID equivalent ³	Luminaire Efficacy Rating (lm/W)	BUG rating
35W32LED4K-R-LE2R	3898	35	0.29	0.17	0.16	0.15	N/A	N/A	350	70-100W	111.4	B1-U0-G1
35W32LED4K-R-LE3R	3816	35	0.29	0.17	0.16	0.15	N/A	N/A	350	70-100W	109.0	B1-U0-G1
35W32LED4K-R-LE4R	3844	35	0.29	0.17	0.16	0.15	N/A	N/A	350	70-100W	109.8	B1-U0-G1
35W32LED4K-R-LE5R	3867	35	0.29	0.17	0.16	0.15	N/A	N/A	350	70-100W	110.5	B3-U0-G1
55W32LED4K-R-LE2R	5510	52	0.40	0.23	0.21	0.19	N/A	N/A	530	70-100W	106.0	B1-U0-G1
55W32LED4K-R-LE3R	5388	52	0.40	0.23	0.21	0.19	N/A	N/A	530	70-100W	103.6	B2-U0-G2
55W32LED4K-R-LE4R	5435	52	0.40	0.23	0.21	0.19	N/A	N/A	530	70-100W	104.5	B1-U0-G2
55W32LED4K-R-LE5R	5467	52	0.40	0.23	0.21	0.19	N/A	N/A	530	70-100W	105.1	B3-U0-G1
55W48LED4K-R-LE2R	5779	55	0.38	0.22	0.23	0.21	0.17	0.13	350	70-100W	105.1	B2-U0-G2
55W48LED4K-R-LE3R	5588	55	0.38	0.22	0.23	0.21	0.17	0.13	350	70-100W	101.6	B2-U0-G2
55W48LED4K-R-LE4R	5700	55	0.38	0.22	0.23	0.21	0.17	0.13	350	70-100W	103.6	B1-U0-G2
55W48LED4K-R-LE5R	5733	55	0.38	0.22	0.23	0.21	0.17	0.13	350	70-100W	104.2	B3-U0-G1
80W48LED4K-R-LE2R	8198	79	0.63	0.36	0.34	0.31	0.24	0.18	530	100-150W	103.8	B2-U0-G2
80W48LED4K-R-LE3R	7863	79	0.63	0.36	0.34	0.31	0.24	0.18	530	100-150W	99.5	B2-U0-G2
80W48LED4K-R-LE4R	8086	79	0.63	0.36	0.34	0.31	0.24	0.18	530	100-150W	102.4	B2-U0-G2
80W48LED4K-R-LE5R	8133	79	0.63	0.36	0.34	0.31	0.24	0.18	530	100-150W	102.9	B3-U0-G2
70W64LED4K-R-LE2R	7768	71	0.58	0.34	0.32	0.30	0.24	0.20	350	100-150W	109.4	B2-U0-G2
70W64LED4K-R-LE3R	7722	71	0.58	0.34	0.32	0.30	0.24	0.20	350	100-150W	108.8	B2-U0-G2
70W64LED4K-R-LE4R	7821	71	0.58	0.34	0.32	0.30	0.24	0.20	350	100-150W	110.2	B2-U0-G2
70W64LED4K-R-LE5R	7867	71	0.58	0.34	0.32	0.30	0.24	0.20	350	100-150W	110.8	B3-U0-G2
110W64LED4K-R-LE2R	10935	103	0.80	0.46	0.42	0.38	0.34	0.28	530	150-175W	106.2	B3-U0-G3
110W64LED4K-R-LE3R	10798	103	0.80	0.46	0.42	0.38	0.34	0.28	530	150-175W	104.8	B3-U0-G3
110W64LED4K-R-LE4R	10870	103	0.80	0.46	0.42	0.38	0.34	0.28	530	150-175W	105.5	B2-U0-G2
110W64LED4K-R-LE5R	10933	103	0.80	0.46	0.42	0.38	0.34	0.28	530	150-175W	106.1	B4-U0-G2
90W80LED4K-R-LE2R	9677	87	0.78	0.43	0.40	0.34	0.30	0.25	350	100-150W	111.2	B2-U0-G2
90W80LED4K-R-LE3R	9429	87	0.78	0.43	0.40	0.34	0.30	0.25	350	100-150W	108.4	B2-U0-G2
90W80LED4K-R-LE4R	9544	87	0.78	0.43	0.40	0.34	0.30	0.25	350	100-150W	109.7	B2-U0-G2
90W80LED4K-R-LE5R	9600	87	0.78	0.43	0.40	0.34	0.30	0.25	350	100-150W	110.3	B4-U0-G2
135W80LED4K-R-LE2R	13440	128	1.15	0.61	0.58	0.50	0.43	0.35	530	200-250W	105.0	B3-U0-G3
135W80LED4K-R-LE3R	13061	128	1.15	0.61	0.58	0.50	0.43	0.35	530	200-250W	102.0	B3-U0-G3
135W80LED4K-R-LE4R	13256	128	1.15	0.61	0.58	0.50	0.43	0.35	530	200-250W	103.6	B3-U0-G3
135W80LED4K-R-LE5R	13333	128	1.15	0.61	0.58	0.50	0.43	0.35	530	200-250W	104.2	B4-U0-G2

¹ L70 = 100,000 hrs (at ambient temperature = 25°C)

² System wattage includes the lamp and the LED driver.

³ Equivalence should always be confirmed by a photometric layout

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.



Project: _____
 Location: _____
 Cat.No: _____
 Type: _____
 Lamps: _____ Qty: _____
 Notes: _____

The Philips Lumece RoadFocus LED Cobra Head luminaires feature a sleek design that provides seamless replacement of existing HID luminaires. RoadFocus is available in three sizes, offers multiple lumen packages, and a complete array of optical distributions, making it an outstanding solution for all types of roadway applications.

Ordering guide

Example: RFL-145W64LED4K-T-R2S-UNIV-DMG-OTL-RCD7-SP2-WC10-GY3

Luminaire	LED Module	Optical System	Voltage	Driver and Dimming	Wattage Switch	Twist-Lock Receptacle	Surge Protection	Warranty	Finish
RFL								WC10	
RFL RoadFocus Large	145W64LED4K-T or 180W80LED4K-T or 215W96LED4K-T or 241W112LED4K-T	R2S Type II Short R2M Type II Medium R3S Type III Short R3M Type III Medium R4M Type IV Medium 5 Type V	UNIV 120-277VAC HVU 347-480VAC	<i>Standard:</i> DMG ^{1,6} Dimmable driver 0-10V <i>Optional:</i> AMPD ^{2,4,5,6} Amplight Dimming DynaDimmer Economy Profile CDMGE25 ^{2,4,5,6} CDMGE50 ^{2,4,5,6} CDMGE75 ^{2,4,5,6} DynaDimmer Median Profile CDMGM25 ^{2,4,5,6} CDMGM50 ^{2,4,5,6} CDMGM75 ^{2,4,5,6} DynaDimmer Safety Profile CDMGS25 ^{2,4,5,6} CDMGS50 ^{2,4,5,6} CDMGS75 ^{2,4,5,6} DALI ^{2,4,5,6} Digitally Addressable Lighting Interface DMG-AST ^{*2,4} Adjustable Startup Time DMG-CLO ^{*2,4,5} Constant Light Output DMG-OTL ^{*2,4} Over The Life <i>*Includes 0-10v Dimming</i>	FAWS ⁵ Field Adjustable Wattage Selector (optional)	<i>Standard:</i> RCD ^{1,3,7} Receptacle for twist-lock photocell or shorting cap, 5-pin (standard) <i>Optional:</i> RCD7 ⁷ Receptacle for twist-lock photocell or shorting cap, 7-pin (optional)	SP2 ⁸ 20kV / 20kA Surge Protector (optional)	WC10 ¹ 10-year limited warranty (standard)	BK Black Finish BR Bronze Finish GY3 Gray Finish WH White Finish

1. Please note these integrated features come standard with RoadFocus luminaires.

2. Denotes programmable driver option. Not available with HVU (347-480volt).

3. Use of photoelectric cell or shorting cap is required to ensure proper illumination.

4. Not available with HVU (347-480volt).

5. FAWS not available with AMPD, CDMG options, DALI or CLO.

6. Dimming choices: Select either DMG or AMPD or one of the CDMG options or DALI.

7. When RCD7 option is selected you will get 7-pin instead of standard RCD 5-pin.

8. When SP2 option is selected you will get SP2 instead of standard SP1.



RFL RoadFocus LED Cobrahead, Large

145, 180, 215, and 241W

Accessories (must be ordered as separate line items – quickly and easily installed in the field)

<p>ACC-RFS-RFM-RFL-PH9⁹ Shorting cap</p> <p>ACC-RFS-RFM-RFL-HS House side shield, 1 per 16 LED light engine.</p> <p>ACC-RFS-RFM-RFL-UNIV-PH8⁹ Twist-lock Photoelectric Cell, UNIV (120-277VAC).</p> <p>ACC-RFM-RFL-PH8/347⁹ Twist-lock Photoelectric Cell, HVU 347VAC.</p> <p>ACC-RFM-RFL-PH8/480⁹ Twist-lock Photoelectric Cell, HVU 480VAC.</p> <p>ACC-RFS-RFM-RFL-UNIV-PH8XL⁹ Twist-lock Photoelectric Cell, extended life, UNIV (120-277VAC).</p>	<p>ACC-RFS-RFM-RFL-UNIV-SPC^{9,10} Starsense twist-lock photoelectric cell & antenna node, UNIV (120-277VAC).</p> <p>ACC-RFM-RFL-HVU-SPC^{9,10} Starsense twist-lock photoelectric cell & antenna node, HVU (347-480VAC).</p> <p>ACC-RFS-RFM-RFL-UNIV-SPCD^{9,10} Starsense dimmable twist-lock photoelectric cell & antenna node, UNIV (120-277VAC).</p>
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9. Use of photoelectric cell or shorting cap is required to ensure proper illumination.

10. Please note that more hardware as well as software are required – please contact the quotations department for help with putting together the entire control system.

LED Wattage and Lumen Values

LED = Philips Lumileds LUXEON T, CRI = 70, CCT = 4000K (+/- 350K)

System (LED + driver) rated life = 100,000 hrs¹¹

LED Module	Typical Delivered Lumens	Typical System Wattage (W) ¹²	LED Current (mA)	Typical System Current (A) @						Efficacy (Lm/W)	BUG Rating
				120V	208V	240V	277V	347V	480V		
145W64LED4K-T-R2S	16,349	137	700	1.15	0.66	0.58	0.51	0.41	0.31	119	B3-U0-G2
145W64LED4K-T-R2M	16,046	137	700	1.15	0.66	0.58	0.51	0.41	0.31	117	B3-U0-G3
145W64LED4K-T-R3S	15,763	137	700	1.15	0.66	0.58	0.51	0.41	0.31	115	B2-U0-G3
145W64LED4K-T-R3M	15,697	137	700	1.15	0.66	0.58	0.51	0.41	0.31	115	B3-U0-G2
180W80LED4K-T-R2S	20,444	174	700	1.46	0.86	0.76	0.69	0.52	0.39	117	B3-U0-G2
180W80LED4K-T-R2M	20,065	174	700	1.46	0.86	0.76	0.69	0.52	0.39	115	B3-U0-G3
180W80LED4K-T-R3S	19,711	174	700	1.46	0.86	0.76	0.69	0.52	0.39	113	B2-U0-G3
180W80LED4K-T-R3M	19,628	174	700	1.46	0.86	0.76	0.69	0.52	0.39	113	B3-U0-G3
215W96LED4K-T-R2S	24,538	207	700	1.74	1.01	0.89	0.80	0.62	0.46	119	B3-U0-G2
215W96LED4K-T-R2M	24,084	207	700	1.74	1.01	0.89	0.80	0.62	0.46	116	B3-U0-G3
215W96LED4K-T-R3S	23,658	207	700	1.74	1.01	0.89	0.80	0.62	0.46	114	B3-U0-G4
215W96LED4K-T-R3M	23,559	207	700	1.74	1.01	0.89	0.80	0.62	0.46	114	B3-U0-G3
241W112LED4K-T-R2S	28,633	248	700	2.03	1.17	1.02	0.91	0.72	0.53	115	B4-U0-G3
241W112LED4K-T-R2M	28,102	248	700	2.03	1.17	1.02	0.91	0.72	0.53	114	B3-U0-G4
241W112LED4K-T-R3S	27,606	244	700	2.03	1.17	1.02	0.91	0.72	0.53	113	B3-U0-G4
241W112LED4K-T-R3M	27,490	244	700	2.03	1.17	1.02	0.91	0.72	0.53	113	B3-U0-G4

Type V (5) IES files for all LED modules pending.

11. L₇₀ >100,000 hrs (at ambient temperature = 25°C).

12. System wattage or total luminaire wattage includes the LED module and the LED driver.

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.

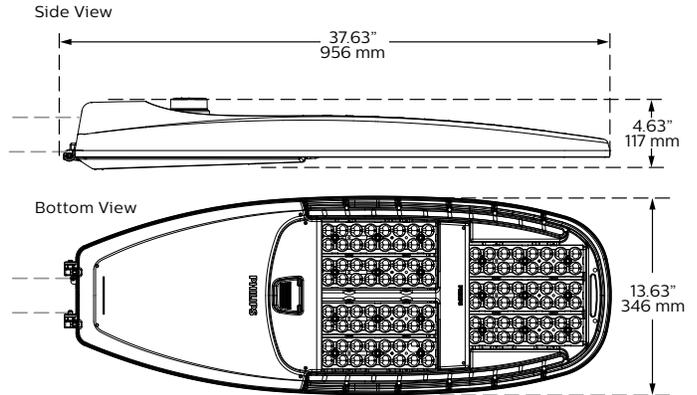
RFL RoadFocus LED Cobrahead, Large

145, 180, 215, and 241W

Field Adjustable Wattage (FAWS) Multiplier Chart

FAWS Position	Typical Delivered Lumens Multiplier	Typical System wattage and typical current
1	0.37	0.29
2	0.55	0.50
3	0.62	0.58
4	0.71	0.69
5	0.77	0.75
6	0.81	0.81
7	0.84	0.87
8	0.94	0.91
9	0.98	0.96
10	1.00	1.00

Dimensions



Weight: 27.3 Lbs
EPA: 0.92 sq. ft.

Predicted Lumen Depreciation Data^{14,15,16}

Ambient Temperature °C	Driver mA	Calculated L ₇₀ Hours	L ₇₀ per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	700 mA	>100,000 hours	>60,000 hours	>94%

14. Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.

15. L₇₀ is the predicted time when LED performance depreciates to 70% of initial lumen output.

16. Calculated per IESNA TM21-11. Published L₇₀ hours limited to 6 times actual LED test hours

Specifications

Housing

Made of a low copper die cast Aluminum alloy (A360), 0.100" (2.5mm) minimum thickness. Fits on a 1.66" (42mm) O.D. (1.25" NPS), 1.9" (48mm) O.D. (1.5" NPS) or 2 3/8" (60mm) O.D. (2" NPS) by 5 1/2" (140mm) minimum long tenon. Comes with a zinc plated clamp fixed by 2 zinc plated hexagonal bolts 3/8 16 UNC for ease of installation. Provides an easy step adjustment of +/- 5° tilt in 2.5° increments. Includes integral bubble level standard (always included). A quick release, tool less entry, single latch, hinged, removable door opens downward to provide access to electronic components and to a terminal block. Door is secured to prevent accidental dropping or disengagement. A clearance of 13" (330mm) at the rear is required in order to remove the door. Complete with a bird guard protecting against birds and similar intruders and an ANSI label to identify wattage and source (both included in box). Housing (including electrical compartment) rated IP54 per ANSI C136.37.

Light Engine

Composed of 4 main components: LED Module / Optical System / Heat Sink / Driver

Electrical components are RoHS compliant, IP66 sealed light engine equipped with Philips Lumileds LUXEON T LEDs. LEDs tested by ISO 17025-2005 accredited lab in accordance with IESNA LM-80 guidelines in compliance with EPA ENERGY STAR, extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

LED Module (Included), LED type Philips Lumileds LUXEON T. Composed of high performance white LEDs. Color temperature as per ANSI bin 4000 Kelvin nominal (3985K +/- 275K), CRI 70 Min. 75 Typical.

Optical System: Composed of high performance optical grade polymer refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. System is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. Dark Sky compliant with 0% uplight and U0 per IESNA TM-15.

Heat Sink: Built in the housing, designed to ensure high efficacy and superior cooling by natural vertical convection air flow pattern always close to LEDs and driver optimising their efficiency and life. Product does not use any cooling device with moving parts (only passive cooling). Wide openings enable natural cleaning and removal of dirt and debris. Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +40°C / +104°F.

RFL RoadFocus LED Cobrahead, Large

145, 180, 215, and 241W

Specifications (continued)

Driver: High power factor of 90% min. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 or 347 to 480 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max.

(DMG), Dimming compatible 0-10 volts.

The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating 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. Standard built in driver surge protection of 2.5kV (min).

Integrated Features

DMG: Dimmable driver 0-10V.

RCD*: Receptacle with 5 pins enabling dimming, can be used with a twist lock Starsense or photoelectric cell or a shorting cap.

WC10: 10-year limited warranty from defects in material and workmanship in its intended use, as well as coverage for finish. Visit website for more details.

SP1: Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA.

Please note that these integrated features always come with RoadFocus luminaire.

** Use of photoelectric cell or shorting cap is required to ensure proper illumination.*

Driver and Luminaire Options

AMPD*: Driver pre-programmed for compatibility with Amplit control system.

AST*: Pre-set driver for progressive start-up of the LED module(s) to optimize energy management and enhance visual comfort at start-up.

CLO*: Pre-set driver to manage the lumen depreciation by adjusting the power given to the LEDs offering the same lighting intensity during the entire lifespan of the LED module.

DALI*: Pre-set driver compatible with the DALI control system.

OTL*: Pre-set driver to signal end of life of the LED module(s) for better fixture management.

CDMG*: Dynamimmer standard dimming functionalities including pre-programmed scenarios to suit many applications and needs from safety to maximum energy savings

Safety Mode:

CDMG525: 4 hours, 25% power dimming

CDMG550: 4 hours 50% power dimming

CDMG575: 4 hours 75% power dimming

Median Mode:

CDMG25: 6 hours 25% power dimming

CDMG50: 6 hours 50% power dimming

CDMG75: 6 hours 75% power dimming

Economy Mode:

CDMG25: 8 hours 25% power dimming

CDMG50: 8 hours 50% power dimming

CDMG75: 8 hours 75% power dimming

**Not available with HVU (347-480V)*

FAWS: Field Adjustable Wattage Selector, pre-set to the highest position, can be easily switched in the field to the required position. This reduces total luminaire wattage consumption and reduces the light level – see the FAWS multiplier chart for more details.
NOTE: When using FAWS with dimming, set the switch to position 10 (maximum output) to enable dimming.

SP2: 20kV / 20kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level.

RCD7*: Receptacle with 7 pins enabling dimming and additional functionality (to be determined), can be used with a twist lock Starsense node or photoelectric cell or a shorting cap.

Please note: Additional hardware will be required to utilize the additional 2 pins on this receptacle.

** Use of photoelectric cell or shorting cap is required to ensure proper illumination.*

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, Philips System Reliability Tool, Philips Advance data and Philips Lumileds LM-80/TM-21 data, expected to reach 100,000 + hours (72W32LED and 108W48LED at 700mA) or 94,500 hours (108W32LED and 160W48LED at 1050mA) with >L70 lumen maintenance @ 25°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours and corrosion.

Wiring

The connection of the luminaire is done using a terminal block connector 600V, 85A for use with #2 14 AWG. wires from the primary circuit, located inside the housing. Due to the inrush current that occurs with electronic drivers, recommend using a time delay or slow blow fuse to avoid unnecessary and unwanted fuse blowing that can occur with fast acting fuses.

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 and/or rubber.

Finish

Color in accordance with the AAMA 2603 standard. Application of polyester powder coat paint (4 mils/100 microns) with \pm 1 mils/24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 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 testing performed and per ASTM B117 standard.

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.

Vibration Resistance

The RFL meets the ANSI C136.31, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100,000 cycles by an independent lab)

Certifications and Compliance

cULus Listed for Canada and USA. Luminaire meets DOE and MSSLC Model Specification for LED Roadway Luminaires. RoadFocus LED Cobrahead luminaires are DesignLights Consortium qualified.

Limited Warranty

10-year limited warranty. See philips.com/luminaires for details and restrictions.

Brackets/Arms

For brackets / arms available with this luminaire, see Lumec 3D for details.



**PHILIPS
LUMEC**

Roadway

RoadFocus

72, 108 and 160W RFM



Project: _____
 Location: _____
 Cat.No: _____
 Type: _____
 Lamps: _____ Qty: _____
 Notes: _____

The Philips Lumec RoadFocus LED Cobra Head luminaires feature a sleek design that provides seamless replacement of existing HID luminaires. RoadFocus is available in three sizes, offers multiple lumen packages, and a complete array of optical distributions, making it an outstanding solution for all types of roadway applications.

Ordering guide

Example: RFM-72W32LED4K-T-R2S-UNIV-DMG-AST-FAWS-RCD-SP2-WC10-GY3

Luminaire	LED Module	Optical System	Voltage	Driver and Dimming	Wattage Switch	Twist-Lock Receptacle	Surge Protection	Warranty	Finish
RFM	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	WC10	<input type="text"/>
RFM RoadFocus Medium	72W32LED4K-T or 108W32LED4K-T ^{2,4} or 108W48LED4K-T or 160W48LED4K-T ^{2,4}	R2S Type II Short R2M Type II Medium R3S Type III Short R3M Type III Medium R4M Type IV Medium 5 Type V	UNIV 120-277VAC HVU 347-480VAC	<i>Standard:</i> DMG ^{1,6} Dimmable driver 0-10V <i>Optional:</i> AMPD ^{2,4,5,6} Amplight Dimming DynaDimmer Economy Profile CDMG E25 ^{2,4,5,6} CDMG E50 ^{2,4,5,6} CDMG E75 ^{2,4,5,6} DynaDimmer Median Profile CDMG M25 ^{2,4,5,6} CDMG M50 ^{2,4,5,6} CDMG M75 ^{2,4,5,6} DynaDimmer Safety Profile CDMG S25 ^{2,4,5,6} CDMG S50 ^{2,4,5,6} CDMG S75 ^{2,4,5,6} DALI ^{2,4,5,6} Digitally Addressable Lighting Interface DMG-AST ^{*2,4} Adjustable Startup Time DMG-CLO ^{*2,4,5} Constant Light Output DMG-OTL ^{*2,4} Over The Life <i>*Includes 0-10v Dimming</i>	FAWS ⁵ Field Adjustable Wattage Selector (optional)	<i>Standard:</i> RCD ^{1,3,7} Receptacle for twist-lock photocell or shorting cap, 5-pin (standard) <i>Optional:</i> RCD ^{7,3,7} Receptacle for twist-lock photocell or shorting cap, 7-pin (optional)	SP2 ⁸ 20kV / 20kA Surge Protector (optional)	WC10 ¹ 10-year limited warranty (standard)	BK Black Finish BR Bronze Finish GY3 Gray Finish WH White Finish

1. Please note these integrated features come standard with RoadFocus luminaires.
 2. Denotes programmable driver option. Not available with HVU (347-480volt). Not available with 1050 mA versions (108W32LED, 160W48LED).
 3. Use of photoelectric cell or shorting cap is required to ensure proper illumination.
 4. Not available with HVU (347-480volt).
 5. FAWS not available with AMPD, CDMG options, DALI or CLO.
 6. Dimming choices: Select either DMG or AMPD or one of the CDMG options or DALI.
 7. When RCD7 option is selected you will get 7-pin instead of standard RCD 5-pin.
 8. When SP2 option is selected you will get SP2 instead of standard SP1.



RFM RoadFocus LED Cobrahead, Medium

72, 108, and 160W

Accessories (must be ordered as separate line items - quickly and easily installed in the field)

<p>ACC-RFS-RFM-RFL-PH9⁹ Shorting cap</p> <p>ACC-RFS-RFM-RFL-HS House side shield, 1 per 16 LED light engine.</p> <p>ACC-RFS-RFM-RFL-UNIV-PH8⁹ Twist-lock Photoelectric Cell, UNIV (120-277VAC).</p> <p>ACC-RFM-RFL-PH8/347⁹ Twist-lock Photoelectric Cell, HVU 347VAC.</p> <p>ACC-RFM-RFL-PH8/480⁹ Twist-lock Photoelectric Cell, HVU 480VAC.</p> <p>ACC-RFS-RFM-RFL-UNIV-PH8XL⁹ Twist-lock Photoelectric Cell, extended life, UNIV (120-277VAC).</p>	<p>ACC-RFS-RFM-RFL-UNIV-SPC^{9,10} Starsense twist-lock photoelectric cell & antenna node, UNIV (120-277VAC).</p> <p>ACC-RFM-RFL-HVU-SPC^{9,10} Starsense twist-lock photoelectric cell & antenna node, HVU (347-480VAC).</p> <p>ACC-RFS-RFM-RFL-UNIV-SPCD^{9,10} Starsense dimmable twist-lock photoelectric cell & antenna node, UNIV (120-277VAC).</p>
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9. Use of photoelectric cell or shorting cap is required to ensure proper illumination.

10. Please note that more hardware as well as software are required - please contact the quotations department for help with putting together the entire control system.

LED Wattage and Lumen Values

LED = Philips Lumileds LUXEON T, CRI = 70, CCT = 4000K (+/- 350K)

System (LED + driver) rated life = 100,000 hrs¹¹

LED Module	Typical Delivered Lumens	Typical System Wattage (W) ¹²	LED Current (mA)	Typical System Current (A) @						Efficacy (Lm/W)	BUG Rating
				120V	208V	240V	277V	347V	480V		
72W32LED4K-T-R2S	8,330	73	700	0.62	0.36	0.31	0.28	0.21	0.15	114	B2-U0-G1
72W32LED4K-T-R2M	8,140	73	700	0.62	0.36	0.31	0.28	0.21	0.15	112	B2-U0-G2
72W32LED4K-T-R3S	8,085	73	700	0.62	0.36	0.31	0.28	0.21	0.15	111	B1-U0-G2
72W32LED4K-T-R3M	8,178	73	700	0.62	0.36	0.31	0.28	0.21	0.15	112	B2-U0-G2
108W32LED4K-T-R2S	11,169	108	1050	0.91	0.53	0.47	0.41	N/A		103	B2-U0-G2
108W32LED4K-T-R2M	10,914	108	1050	0.91	0.53	0.47	0.41			101	B2-U0-G2
108W32LED4K-T-R3S	10,841	108	1050	0.91	0.53	0.47	0.41			100	B1-U0-G1
108W32LED4K-T-R3M	10,965	108	1050	0.91	0.53	0.47	0.41			102	B2-U0-G2
108W48LED4K-T-R2S	12,507	106	700	0.93	0.53	0.46	0.40	0.32	0.23	118	B3-U0-G2
108W48LED4K-T-R2M	12,222	106	700	0.93	0.53	0.46	0.40	0.32	0.23	115	B2-U0-G2
108W48LED4K-T-R3S	12,140	106	700	0.93	0.53	0.46	0.40	0.32	0.23	115	B2-U0-G2
108W48LED4K-T-R3M	12,279	106	700	0.93	0.53	0.46	0.40	0.32	0.23	116	B2-U0-G2
160W48LED4K-T-R2S	16,778	161	1050	1.34	0.76	0.66	0.58	N/A		104	B3-U0-G2
160W48LED4K-T-R2M	16,396	161	1050	1.34	0.76	0.66	0.58			102	B3-U0-G3
160W48LED4K-T-R3S	16,285	161	1050	1.34	0.76	0.66	0.58			101	B2-U0-G3
160W48LED4K-T-R3M	16,472	161	1050	1.34	0.76	0.66	0.58			102	B3-U0-G3

Type V (5) IES files for all LED modules pending.

11. L₇₀ >100,000 hrs (at ambient temperature = 25°C).

12. System wattage or total luminaire wattage includes the LED module and the LED driver.

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.

RFM RoadFocus LED Cobrahead, Medium

72, 108, and 160W

Field Adjustable Wattage (FAWS) Multiplier Chart

72W32LED4K-T or 108W48LED4K-T (700 mA)

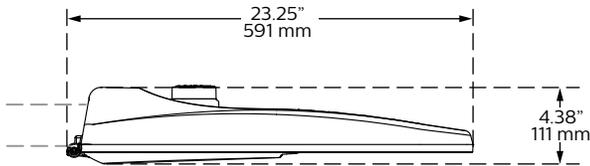
FAWS Position	Typical Delivered Lumens Multiplier	Typical System wattage and typical current
1	0.37	0.29
2	0.55	0.50
3	0.62	0.58
4	0.71	0.69
5	0.77	0.75
6	0.81	0.81
7	0.84	0.87
8	0.94	0.91
9	0.98	0.96
10	1.00	1.00

108W32LED4K-T OR 160W48LED4K-T (1050mA)

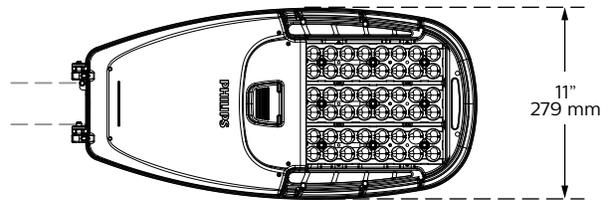
FAWS Position	Typical Delivered Lumens Multiplier	Typical System wattage and typical current
1	0.33	0.27
2	0.56	0.48
3	0.64	0.57
4	0.71	0.65
5	0.79	0.74
6	0.84	0.79
7	0.89	0.85
8	0.92	0.90
9	0.96	0.95
10	1.00	1.00

Dimensions

Side View



Bottom View



Weight: 12.2 Lbs
EPA: 0.53 sq. ft.

Predicted Lumen Depreciation Data^{14,15,16}

Ambient Temperature °C	Driver mA	Calculated L ₇₀ Hours	L ₇₀ per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 1050 mA	>100,000 hours	>60,000 hours	>96%

14. Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.

15. L₇₀ is the predicted time when LED performance depreciates to 70% of initial lumen output.

16. Calculated per IESNA TM21-11. Published L₇₀ hours limited to 6 times actual LED test hours

Specifications

Housing

Made of a low copper die cast Aluminum alloy (A360), 0.100" (2.5mm) minimum thickness. Fits on a 1.66" (42mm) O.D. (1.25" NPS), 1.9" (48mm) O.D. (1.5" NPS) or 2 3/8" (60mm) O.D. (2" NPS) by 5 1/2" (140mm) minimum long tenon. Comes with a zinc plated clamp fixed by 2 zinc plated hexagonal bolts 3/8 16 UNC for ease of installation. Provides an easy step adjustment of +/- 5° tilt in 2.5° increments. Includes integral bubble level standard (always included). A quick release, tool less entry, single latch, hinged, removable door opens downward to provide access to electronic components and to a terminal block. Door is secured to prevent accidental dropping or disengagement. A clearance of 13" (330mm) at the rear is required in order to remove the door. Complete with a bird guard protecting against birds and similar intruders and an ANSI label to identify wattage and source (both included in box). Housing (including electrical compartment) rated IP54 per ANSI C136.37.

Light Engine

Composed of 4 main components: LED Module / Optical System / Heat Sink / Driver

Electrical components are RoHS compliant, IP66 sealed light engine equipped with Philips Lumileds LUXEON T LEDs. LEDs tested by ISO 17025-2005 accredited lab in accordance with IESNA LM-80 guidelines in compliance with EPA ENERGY STAR, extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

LED Module (Included), LED type Philips Lumileds LUXEON T. Composed of high performance white LEDs. Color temperature as per ANSI bin 4000 Kelvin nominal (3985K +/- 275K), CRI 70 Min. 75 Typical.

Optical System: Composed of high performance optical grade polymer refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. System is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. Dark Sky compliant with 0% uplight and U0 per IESNA TM-15.

Heat Sink: Built in the housing, designed to ensure high efficacy and superior cooling by natural vertical convection air flow pattern always close to LEDs and driver optimising their efficiency and life. Product does not use any cooling device with moving parts (only passive cooling). Wide openings enable natural cleaning and removal of dirt and debris. Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +40°C / +104°F.

RFM RoadFocus LED Cobrahead, Medium

72, 108, and 160W

Specifications (continued)

Driver: High power factor of 90% min. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 or 347 to 480 VAC rated for both application line to line or line to neutral. Class I, THD of 20% max.

(DMG), Dimming compatible 0-10 volts. The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating 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. Standard built in driver surge protection of 2.5kV (min).

Integrated Features

DMG: Dimmable driver 0-10V.

RCD*: Receptacle with 5 pins enabling dimming, can be used with a twist lock Starsense or photoelectric cell or a shorting cap.

WC10: 10-year limited warranty from defects in material and workmanship in its intended use, as well as coverage for finish. Visit website for more details.

SP1: Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA.

Please note that these integrated features always come with RoadFocus luminaire.

** Use of photoelectric cell or shorting cap is required to ensure proper illumination.*

Driver and Luminaire Options

AMPD*: Driver pre-programmed for compatibility with Amplight control system.

AST*: Pre-set driver for progressive start-up of the LED module(s) to optimize energy management and enhance visual comfort at start-up.

CLO*: Pre-set driver to manage the lumen depreciation by adjusting the power given to the LEDs offering the same lighting intensity during the entire lifespan of the LED module.

DALI*: Pre-set driver compatible with the DALI control system.

OTL*: Pre-set driver to signal end of life of the LED module(s) for better fixture management.

CDMG*: Dynamimmer standard dimming functionalities including pre-programmed scenarios to suit many applications and needs from safety to maximum energy savings

Safety Mode:

CDMG525: 4 hours, 25% power dimming

CDMG550: 4 hours 50% power dimming

CDMG575: 4 hours 75% power dimming

Median Mode:

CDMG25: 6 hours 25% power dimming

CDMG50: 6 hours 50% power dimming

CDMG75: 6 hours 75% power dimming

Economy Mode:

CDMG25: 8 hours 25% power dimming

CDMG50: 8 hours 50% power dimming

CDMG75: 8 hours 75% power dimming

**Not available with HVU (347-480V)*

FAWS: Field Adjustable Wattage Selector, pre-set to the highest position, can be easily switched in the field to the required position. This reduces total luminaire wattage consumption and reduces the light level – see the FAWS multiplier chart for more details. *NOTE: When using FAWS with dimming, set the switch to position 10 (maximum output) to enable dimming.*

SP2: 20kV / 20kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level.

RCD7*: Receptacle with 7 pins enabling dimming and additional functionality (to be determined), can be used with a twist lock Starsense node or photoelectric cell or a shorting cap.

Please note: Additional hardware will be required to utilize the additional 2 pins on this receptacle.

** Use of photoelectric cell or shorting cap is required to ensure proper illumination.*

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, Philips System Reliability Tool, Philips Advance data and Philips Lumileds LM-80/TM-21 data, expected to reach 100,000 + hours (72W32LED and 108W48LED at 700mA) or 94,500 hours (108W32LED and 160W48LED at 1050mA) with >L70 lumen maintenance @ 25°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours and corrosion.

Wiring

The connection of the luminaire is done using a terminal block connector 600V, 85A for use with #2 14 AWG. wires from the primary circuit, located inside the housing. Due to the inrush current that occurs with electronic drivers, recommend using a time delay or slow blow fuse to avoid unnecessary and unwanted fuse blowing that can occur with fast acting fuses.

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 and/or rubber.

Finish

Color in accordance with the AAMA 2603 standard. Application of polyester powder 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 D2244 standard, as well as luster retention in keeping with the ASTM D523 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 testing performed and per ASTM B117 standard.

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.

Vibration Resistance

The RFM meets the ANSI C136.31, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100,000 cycles by an independent lab)

Certifications and Compliance

cULus Listed for Canada and USA. Luminaire meets DOE and MSSLC Model Specification for LED Roadway Luminaires. RoadFocus LED Cobrahead luminaires are DesignLights Consortium qualified.

Limited Warranty

10-year limited warranty. See philips.com/luminaires for details and restrictions.

Brackets/Arms

