14-0056

City of Long Beach LED Street Light Scaled Field Placement

Survey Information:

- Scaled Field Placement of 115 LED Street Lights
  - Existing 70HPS
  - 4 LED Manufacturers
  - 4 Different Neighborhoods (Districts 2,3,5,7)
    - Missed District 2 Due to majority of address are apartments
- 379 Survey Cards Sent
  - Total of 132 Responses
- Overall Responses are positive
  - Few negative comments mostly due to existing pole layout

Survey Instrument:

1. **Before** receiving this questionnaire, had you noticed that the Long Beach streetlights described above were replaced in the last few days? ☐ Yes ☐ No (Please skip to #2)
   If Yes: What changes, if any, had you noticed **before** you received this questionnaire?
   _____
2. Now that you have had a chance to observe the new lights, what changes have you noticed?
   _____
3. How would you rate the **new lights compared to the old lights** on the following measures? (Please check one box)

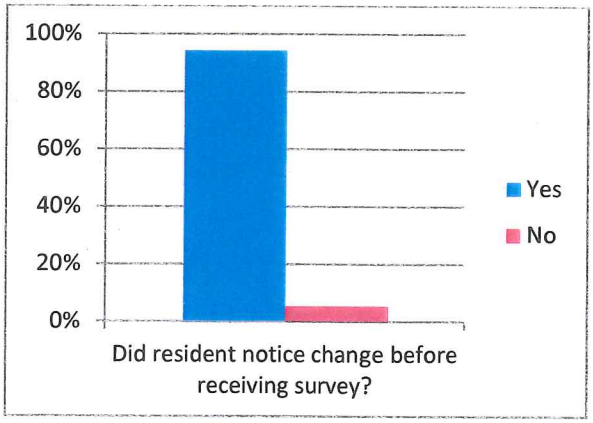
	Much More Satisfied	Somewhat More Satisfied	No Difference	Somewhat Less Satisfied	Much Less Satisfied
New vs. Old Satisfaction	☐	☐	☐	☐	☐

4. How would you rate the **new lights** on the following measures? (Check one box for each rating)

	Excellent	Good	Fair	Poor
Overall	☐	☐	☐	☐
Brightness of the Lights	☐	☐	☐	☐
Color of the Lights	☐	☐	☐	☐
How the lights make the surroundings look	☐	☐	☐	☐
Coverage area of the lights	☐	☐	☐	☐

Survey Results:

Question 1



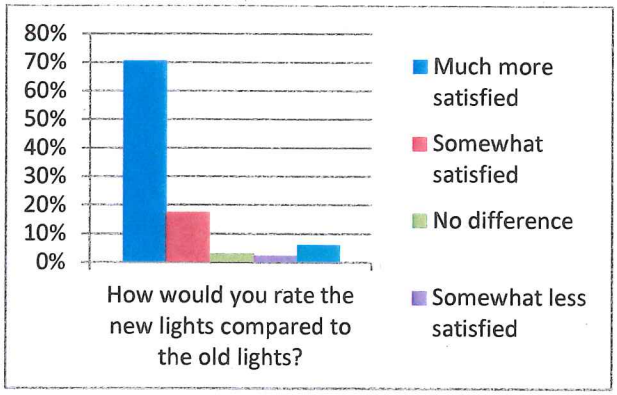
- Common Responses
  - "brighter"
  - "white light"
  - "more coverage"
  - "safer"
- A few negative comments included
  - "dark spots"
  - "too bright"

City of Long Beach LED Street Light Scaled Field Placement

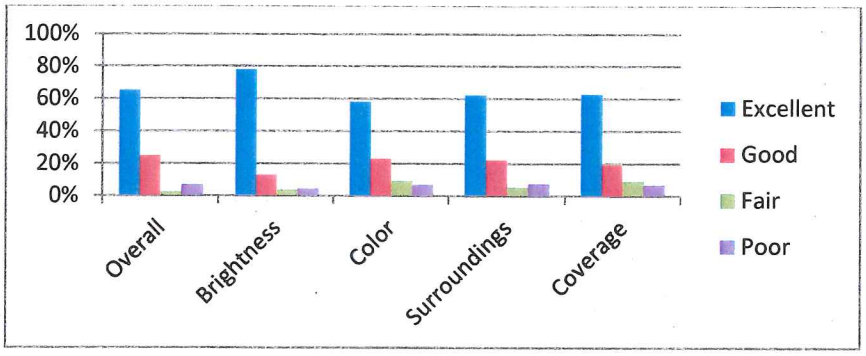
Question 2

- What changes did residents notice?
  - Top Responses:
    - "brightness"
    - "better lighting"
    - "well lit"
  - Few negative responses:
    - "ugly color"
    - "dark areas"
    - "too bright"
    - "need shield so won't shine in house"
  - Notable Quotes:
    - "Very bright and concentrated white light looks like car headlights coming down street...I stoped for a 'car' that wasn't there"
    - "Almost too bright. Glad the light isn't in my front yard."

Question 3



Question 4



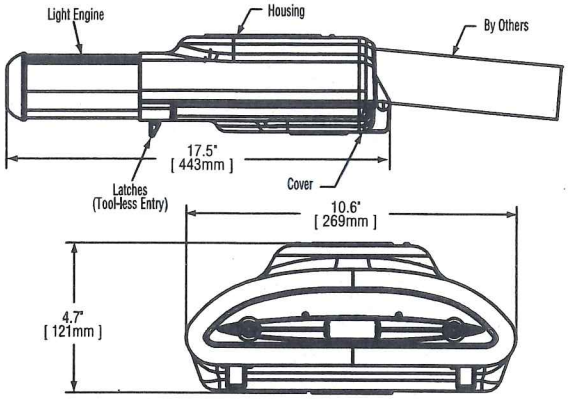
Other Comments

- "warm white whould have been better than the cool white that was installed"
- "thank you for asking! :-) Lights are good, but often times the trees block the light & need to be trimmed"
- "How are they in the fog?"
- "Are the lights also energy efficient?"
- "Need to put more on each street"
- "At age 88 I am not very observant...sorry!!"

STR-LWY-2M-HT LEDway® Streetlight – Type II Medium

Rev. Date: 8/11/11

BetaLED Catalog #: STR - LWY - 2M - HT - - D - - - -



Notes:

Product	Family	Optic	Mounting	# of LEDs (x 10)	LED Series	Voltage	Color Options	Drive Current	Factory-Installed Options
STR	LWY	2M[1]	HT[2]	☐ 02 ☐ 03	D	☐ UL Universal 120–277V ☐ UH Universal 347–480V	☐ SV Silver[3] ☐ BK Black[3] ☐ BZ Bronze[3] ☐ PB Platinum Bronze[3] ☐ WH White[3]	☐ 700 700mA (Standard) ☐ 525 525mA ☐ 350 350mA	☐ 43K 4300K Color Temperature[4] ☐ DIM 0–10V Dimming[5,6,7] ☐ F Fuse[8,9] ☐ HL Hi/Low (175/350/525, dual circuit input)[10,11] ☐ N No Quick Disconnect Harness or Leveling Bubble[12] ☐ PD Power Door[13] ☐ R NEMA Photocell Receptacle[8,14] ☐ SC Door Safety Tether[15] ☐ UTL Utility Option[16]

Please type additional options in manually on the lines provided above.

For additional options, see IP66 spec sheet.

Footnotes

1. IESNA Type II Medium distribution
2. Horizontal tenon mount
3. Light engine portion of extrusion is not painted and will remain natural aluminum regardless of color selection
4. Color temperature per fixture; 6000K standard; minimum 70 CRI
5. Control by others
6. Refer to dimming spec sheet for availability and additional information
7. Can't exceed the specified drive current. Consult factory if exceeding the drive current is necessary.
8. Not available with all multi-level options. Refer to multi-level spec sheet for availability and additional information
9. When code dictates fusing use time delay fuse
10. Refer to multi level spec sheet for availability and additional information
11. Sensor not included
12. Standard product features unless N option is specified
13. All connections between door and fixture are shipped unconnected from the factory; door release spring included to open door automatically when the latches are released
14. Photocell by others
15. Stainless steel aircraft cable
16. Includes exterior wattage label that reflects watts for the drive current selected. The ability to exceed drive current will be disabled.

LED PERFORMANCE SPECS

# of LEDs	Initial Delivered Lumens – Type II Medium @ 6000K	B	U	G	Initial Delivered Lumens – Type II Medium @ 4300K	B	U	G	System Watts 120–480V	Total Current @ 120V	Total Current @ 240V	Total Current @ 277V	Total Current @ 347V	Total Current @ 480V	L_{70} Hours* @ 25° C (77° F)	50K Hours Lumen Maintenance Factor* @ 15° C (59° F)
		Rating**				Rating**										
350mA Fixture Operating at 25° C (77° F)																
20	1,961 (02)	1	1	1	1,807 (02)	1	1	1	25	0.22	0.13	0.14	0.08	0.07	> 150,000	94%
30	2,912 (03)	1	1	1	2,684 (03)	1	1	1	35	0.30	0.17	0.16	0.11	0.09	> 150,000	
525mA Fixture Operating at 25° C (77° F)																
20	2,745 (02)	1	1	1	2,530 (02)	1	1	1	37	0.31	0.17	0.16	0.12	0.10	149,000	93%
30	4,076 (03)	1	1	1	3,757 (03)	1	1	1	52	0.44	0.24	0.22	0.16	0.13	144,000	
700mA (Standard) Fixture Operating at 25° C (77° F)																
20	3,431 (02)	1	1	1	3,162 (02)	1	1	1	50	0.43	0.23	0.21	0.15	0.12	128.000	91%
30	5,096 (03)	1	1	1	4,696 (03)	1	1	1	72	0.61	0.32	0.28	0.21	0.16	120,000	

* For recommended lumen maintenance factor data see TD-13

** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit www.iesna.org/PDF/Erratas/TM-15-07BugRatingsAddendum.pdf

NOTE: All data subject to change without notice.

 • 1200 92nd Street • Sturtevant, WI 53177 • 800-236-6800 • www.betaLED.com

Made in the U.S.A. of U.S. and imported parts.
Meets Buy American requirements within the ARRA.

STR-LWY-2M-HT LEDway® Streetlight – Type II Medium

Rev. Date: 8/11/11

General Description

Fixture housing is all aluminum construction. Standard fixture utilizes terminal block for power input suitable for #2–#14 AWG wire and operates at 700mA. Drive current is field switchable. Fixture is designed to mount on 1.25" IP (1.66" [42mm] O.D.) and/or 2" IP (2.375" [60mm] O.D.) horizontal tenon (minimum 8" [203mm] in length) and is adjustable +/- 5° to allow for fixture leveling (includes two axis T-level to aid in this process). Fixture carries a limited five year warranty.

Electrical

Modular design accommodates varied lighting output from high power, white, 6000K (+/- 500K per full fixture), minimum 70 CRI, long life LED sources. Optional 4300K (+/- 300 K per full fixture) also available. 120–277V 50/60 Hz, Class 1 LED drivers are standard. 347–480V 50/60 Hz option is available. LED drivers have power factor >90% and THD <20% at full load. Quick disconnect harness suitable for mate and break under load provided on power feed to driver for ease of maintenance. Units provided with integral 10kV surge suppression protection standard. Surge protection tested in accordance with IEEE/ANSI C62.41.2.

Finish

Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable silver powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Bronze, black, white and platinum bronze powder topcoats are also available. The finish is covered by our 10 year limited warranty.

Fixture and finish are endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117.

Testing & Compliance

UL listed in the U.S. and Canada for wet locations. Consult factory for CE Certified products. Meets CALTrans 611 Vibration Testing and GR-63-CORE Section 4.4.1/5.4.2 Earthquake Zone 4. Certified to ANSI C136.31-2001 bridge and overpass vibration standards. Dark Sky Friendly. IDA Approved. RoHS Compliant.

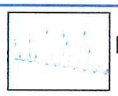
Product qualified on the Design Lights Consortium ("DLC") Qualified Products List ("QPL").

Patents

U.S. and international patents granted and pending. BetaLED is a division of Ruud Lighting, Inc. For a listing of Ruud Lighting, Inc. patents, visit www.uspto.gov.

Field-Installed Accessories

Bird Spikes for Light Engine
☐ XA-BRDSPK30

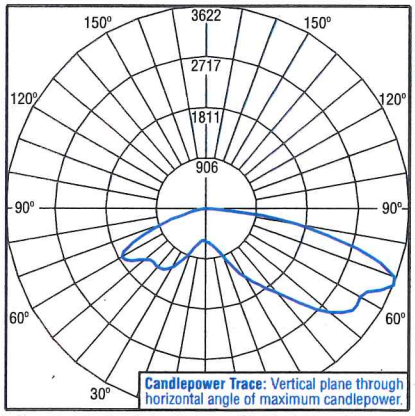


Bird Spikes Kit for Housing
☐ XA-BRDSPKHSG

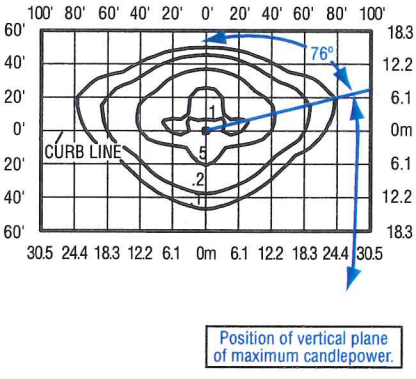
No Photo Available

1.25" IP Pipe Sealing Kit
☐ XA-XIL125IP

Photometrics



Independent Testing Laboratories certified test. Report No. ITL64223. Candlepower trace of 6000K, 40 LED LEDway Streetlight luminaire with IESNA Type II Medium distribution. Luminaire with 6,665 initial delivered lumens operating at 700mA. **All published luminaire photometric testing performed to IESNA LM-79-08 standards.**



Isofootcandle plot of 6000K, 30 LED LEDway Streetlight luminaire with IESNA Type II Medium distribution mounted at 25' (8m) A.F.G. Luminaire with 5,096 initial delivered lumens operating at 700mA. Initial FC at grade.

LEDway® EPA & Weight Calculations

Approximate Weight 120–480V[1]		
20–30 LED fixture	10.5 lbs. (4.8kg)	
EPA		
Horizontal Tenon Mount		
1 fixture	0.565	
EPA		
Round External Mount / Square Internal Mount Horizontal Tenons with Fixture(s)		
PT/PD-1H	Single	0.785
PT/PD-2H(90)	90° Twin	1.019
PT/PD-2H(180)	180° Twin	1.350
PT/PD-3H(90)	90° Triple	1.534
PT/PD-3H(120)	120° Triple	1.383
PT/PD-4H(90)	90° Quad	1.938

1. Add 5 lbs. (2.3kg) for transformer in 347–480V fixtures when multi-level options are selected.

NOTE: All data subject to change without notice.

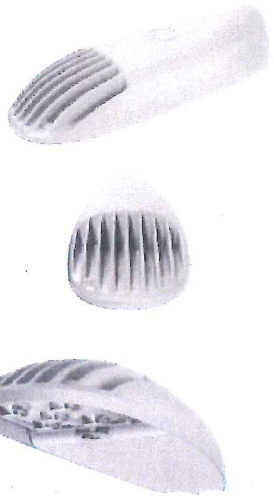
Made in the U.S.A. of U.S. and imported parts.
Meets Buy American requirements within the ARRA.

XSP1™

XSP Series LED Street Light – Horizontal Tenon – Type II

Product Description

Designed from the ground up as a totally optimized LED street light system, the XSP Series delivers incredible efficiency and is designed to provide L70 lifetime over 100,000 hours without sacrificing application performance. Beyond substantial energy savings and reduced maintenance, Cree achieves better optical control with our NanoOptic® Precision Delivery Grid™ optic than a traditional cobra head luminaire. The Cree XSP Series LED Street Light is the best alternative for traditional street lighting with better payback and better performance.



Performance Summary

Utilizes BetaLED® Technology

NanoOptic Precision Delivery Grid optic

CRI: Minimum 70 CRI

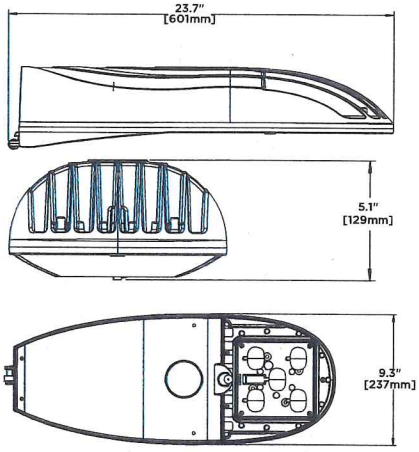
CCT: 4000K (+/- 300K), 5700K (+/- 500K)

Warranty: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

Made in the U.S.A. of U.S. and imported parts

Accessories

Field Installed Accessories
XA-SP1BLS Backlight Control Shield - Provides 1/2 Mounting Height Cutoff
XA-SP1BRDSPK Bird Spikes



Ordering Information

Example: BXSPA021A-USF

BXSP	A	0			A	-			
Product	Version	Mounting	Optic	Modules	Input Power	-	Voltage	Color Options	Options
BXSP	**A**	**0** Horizontal Tenon	**2** Type II **G** Type II w/ BLS	**1** Standard 4000K **A** Standard 5700K **G** High Efficacy 4000K* **N** High Efficacy 5700K*	**A** 53W	-	**U** Universal 120–277V **V** Universal 347–480V**	**S** Silver (Standard) **T** Black **Z** Bronze **B** Platinum Bronze **W** White	**A ROAM® Controls** - Installation of ROAM dimming control module only. Services provided by others. - Includes R option **F Fuse** - When code dictates fusing, use time delay fuse - Not available with V voltage **K Occupancy Control** - Refer to Occupancy Control spec sheet for details **N Utility Label and NEMA Photocell Receptacle** - Includes Q option - Refer to Field Adjustble Output spec sheet for details **Q Field Adjustable Output** - Refer to Field Adjustable Output spec sheet for details **R NEMA Photocell Receptacle** - Photocell by others **U Utility** - Includes exterior wattage label that indicates the maximum available wattage of the luminaire - Includes Q option - Refer to Field Adjustable Output spec sheet for details

* Available Q3 2012. Preliminary data shown.

** 347-480V utilizes magnetic step-down transformer. For input power for 347-480V, refer to the Lumen Output, Electrical, and Lumen Maintenance data table below.

BetaLED TECHNOLOGY

RoHS

c UL us

Rev. Date: 9/14/2012

CREE®

www.cree.com/lighting T (800) 236-6800 F (262) 504-5415

Product Specifications

CONSTRUCTION & MATERIALS

- Die cast aluminum housing
- Tool-less entry
- Mounts on 1.25" IP (1.66" [42mm] O.D.) or 2" IP (2.375" [60mm] O.D.) horizontal tenon (minimum 8" [203mm] in length) and is adjustable +/- 5° to allow for fixture leveling (includes two axis T-level to aid in leveling)
- Designed with 0-10V dimming capabilities. Controls by others
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultradurable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Standard is silver. Black, bronze, platinum bronze and white are also available

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz
- Class 2 output
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used

REGULATORY & VOLUNTARY QUALIFICATIONS

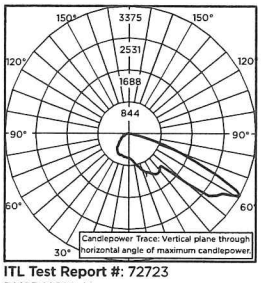
- cULus Listed
- Suitable for wet locations
- Product qualified on the DesignLights Consortium ("DLC") Qualified Products List ("QPL"). Exceptions apply when N, U, or Q options are ordered - see Field Adjustable Output spec sheet for details.
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets CALTrans 611 Vibration testing and GR-63-CORE Section 4.4.1/5.4.2 C62.41.2
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- RoHS Compliant
- Meets Buy American requirements within ARRA

PATENTS

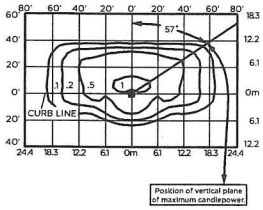
- Visit website for patents that cover these products: Patents http://www.cree.com/patents

Photometry

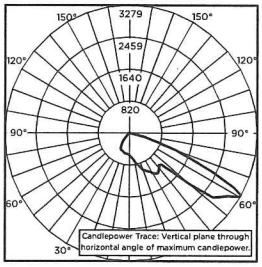
All published luminaire photometric testing performed to IESNA LM-79-08 standards by Independent Testing Laboratories, a NVLAP certified laboratory.



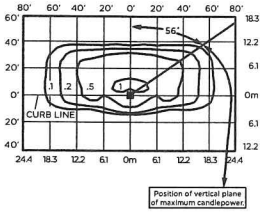
ITL Test Report #: 72723
BXSPA*21A-U
Initial Delivered Lumens: 3,954



BXSPA*21A-U
Mounting Height: 25' (7.6m)
Initial Delivered Lumens: 3,500
Initial FC at grade.



ITL Test Report #: 72722
BXSPA*G1A-U
Initial Delivered Lumens: 3,427



BXSPA*G1A-U
Mounting Height: 25' (7.6m)
Initial Delivered Lumens: 3,065
Initial FC at grade.

Lumen Output, Electrical, and Lumen Maintenance Data

Type 2 Distribution														
Module	Input Power Designator	4000K		5700K		System Watts 120-277V	TOTAL CURRENT				System Watts 347-480V	TOTAL CURRENT		50K Hours Calculated Lumen Maintenance Factor @ 15°C (59°F)***
		Initial Delivered Lumens	BUG Ratings** Per TM-15-11	Initial Delivered Lumens	BUG Ratings** Per TM-15-11		120V	208V	240V	277V		347V	480V	
Standard	A	3,500	B1 U0 G1	3,850	B1 U0 G1	53	0.44	0.26	0.23	0.20	57	0.16	0.12	91%
High Efficacy*	A	4,806	B1 U0 G1	5,340	B1 U0 G1	53	0.44	0.26	0.23	0.20	57	0.16	0.12	91%

Type 2 Distribution w/ BLS														
Module	Input Power Designator	4000K		5700K		System Watts 120-277V	TOTAL CURRENT				System Watts 347-480V	TOTAL CURRENT		50K Hours Calculated Lumen Maintenance Factor @ 15°C (59°F)***
		Initial Delivered Lumens	BUG Ratings** Per TM-15-11	Initial Delivered Lumens	BUG Ratings** Per TM-15-11		120V	208V	240V	277V		347V	480V	
Standard	A	3,065	B1 U0 G1	3,371	B1 U0 G1	53	0.44	0.26	0.23	0.20	57	0.16	0.12	91%
High Efficacy*	A	4,209	B1 U0 G1	4,674	B1 U0 G1	53	0.44	0.26	0.23	0.20	57	0.16	0.12	91%

* Available Q3 2012. Preliminary data shown.
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit www.iesna.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf
*** Projected L_{70} (6K) Hours: >36,000. For recommended lumen maintenance factor data see TD-13

EPA and Weight

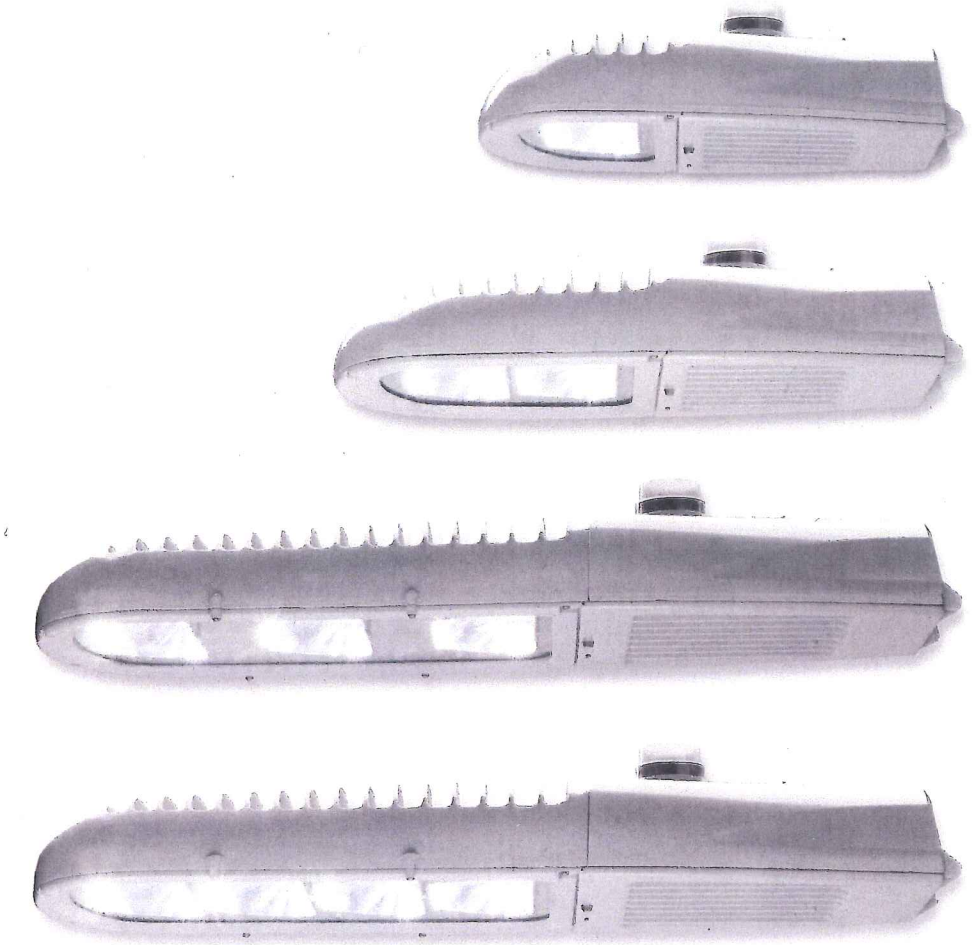
Input Power Designator	Weight 120-277V	Weight 347-480V	EPA				
			1@90	2@90	2@180	3@90	4@90
A	18 lbs (8kg)	22 lbs (9kg)	0.714	1.021	1.428	1.735	2.041

www.cree.com/lighting T (800) 236-6800 F (262) 504-5415

GE
Lighting Solutions

Evolve™ LED Roadway Lighting

Scalable Cobrahead (ERS1, ERS2, ERS3 & ERS4)



imagination at work

Product Features

From local to major roadways, the GE Evolve™ LED Roadway Scalable Cobrahead fixtures are changing the way you light your lanes. Preserving the aesthetic look of traditional roadway Cobrahead fixtures, GE balances the technical needs of a sophisticated LED system with the functional demands of an outdoor fixture facing extreme weather hazards. GE's advanced LED optical design offers hundreds of photometric options to meet your precise lighting requirements, while delivering reduced glare and improved light control. The refined thermal management system incorporates a sleek and robust heat sink directly into the fixture to ensure maximum heat transfer and long LED life.

The GE Evolve LED Roadway Scalable Cobrahead offers more than 11 years of reliable service life to significantly reduce maintenance frequency and expense, based on a 50,000 hour life and 12 hours of operation per day. This efficient fixture can yield up to a 50-percent reduction in system energy compared with standard HID systems, depending on roadway applications, and can also be paired with programmable dimming options for even greater savings and control.

Applications

- Designed to meet recommended luminance and illuminance requirements for local to major roadway / street classifications.

Housing

- Die cast aluminum housing.
- A modern design preserving the aesthetic look of traditional roadway Cobrahead fixtures incorporates the heat sink directly into the unit ensuring maximum heat transfer and long LED life.
- Meets 2G vibration per C136.31-2010
  For 3G rating contact manufacturer.
- Power door assembly with removable retention latch.

LED & Optical Assembly

- Structured LED array for optimized roadway photometric distribution.
- Evolve light engine consisting of scalable reflective technology designed to optimize application efficiency and minimize glare.
- Reverse facing light engine options available.
- Utilizes high brightness LEDs, 70 CRI at 4000K & 5700K typical.
- LM-79 tests and reports are performed in accordance with IESNA standards.

Lumen Maintenance

- System rating is L85 at 50,000 hours. Contact manufacturer for Lxx rating (Lumen Depreciation) beyond 50,000 hours.

Ratings

- Ⓤ/ⓒⓊ listed, suitable for wet locations per UL 1598.
- IP65 rated optical enclosure per ANSI C136.25-2009.
- Temperature rated at -40° to 50°C (-40° to 45°C for ERS4 347-480V fixtures).
- Upward Light Output Ratio (ULOR) = 0.
- RoHS compliant.

Mounting

- Slipfitter with +/- 5 degree of adjustment for leveling.
- Integral die cast mounting pipe stop feature.
- Wildlife intrusion protection at mounting pipe entry.
- Adjustable for 1.25 in. or 2 in. mounting pipe.

Finish

- Corrosion resistant polyester powder painted, minimum 2.0 mil. thickness.
- Standard colors: Black and Gray.
- RAL & custom colors available.

Electrical

- 120-277 volt and 347-480 volt available.
- System power factor is >90% and THD <20%.*
- Class "A" audible sound rating.
- Integral surge protection:
  - For 120-277VAC per IEEE/ANSI C62.41.-1991, 6kV/3kA Location Category B3 (120 Events).
- Optional high capability surge protection per IEEE/ANSI C62.41.2-2002.
  - Rating 1 - 10kV/5kA Location Category (120 events).
  - Rating 2 - 6kV/3kA Location Category C-Low (5000 events).
- EMI: Title 47 CFR Part 15 Class A.
- Photo electric sensors (PE) available for all voltages.

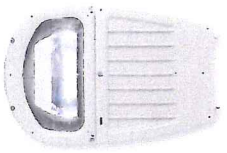
** System power factor and THD is tested and specified at 120V input and maximum load conditions.*

Warranty

- 5-year limited system warranty standard.

Ordering Number Logic

Scalable Cobrahead (ERS1)



E R S 1 _ _ _ _ - _ - _ _ - _ _ - _ - 5 - _ _ - _ - _ _ _ _ - _ _ _

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve **R** = Roadway **S** = Scalable **1** = Optical Assembly	**0** = 120 - 277 **H** = 347 - 480 **1** = 120* **2** = 208* **3** = 240* **4** = 277* **5** = 480* **D** = 347* *Specify single voltage only if fuse option is selected.		**AX** = Extra Narrow Asymmetric (Medium) **BX** = Narrow Asymmetric (Medium) **CX** = Asymmetric (Short) **DX** = Asymmetric Forward (Very Short) **EX** = Asymmetric (Medium)	**5** = 525mA* *Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.	**40** = 4000K **57** = 5700K	**1** = None **2** = PE Rec. **4** = PE Rec. with Shorting Cap **5** = PE Rec. with Control **7** = Dimming PE Receptacle *† **9** = Dimming PE Receptacle with Shorting Cap † PE control not available for multi-volt 346-480V. Must be a discrete voltage (347V or 480V). * Order dimming control PE as a separate item † When ordering PE function socket 7 or 9, a programmable dimming option "P" must also be ordered under the "OPTIONS" column	**BLCK** = Black **GRAY** = Gray Contact manufacturer for other colors.	**E** = GE Level **F** = Fusing **L** = Tool-Less Entry **P** = Programmable Dimming (includes DALI) **T** = Extra Surge Protection* **XXX** = Special Options * Contact manufacturer for details and availability.

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 5700K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	IES FILE NUMBERS 4000K	IES FILE NUMBERS 5700K
AX	AX	3100	3300	43	47	454886	454889
BX		4100	4400	54	59	454887	454890
CX		5100	5500	67	74	454888	454891
AX	BX	3300	3400	43	47	454669	454668
BX		4300	4600	54	59	454670	454667
CX		5300	5700	67	74	454659	454666
AX	CX	3200	3400	43	47	454662	454663
BX		4200	4500	54	59	454661	464664
CX		5200	5600	67	74	454660	454665
AX	DX	3300	3500	43	47	454892	454895
BX		4300	4600	54	59	454893	464896
CX		5300	5700	67	74	454894	454897
AX	EX	3000	3200	43	47	454653	454644
BX		4000.	4300	54	59	454652	454645
CX		5000	5400	67	74	454651	454646

Photometrics

Scalable Cobrahead (ERS1)

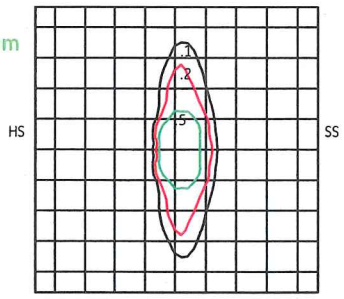
ISO Plot
Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

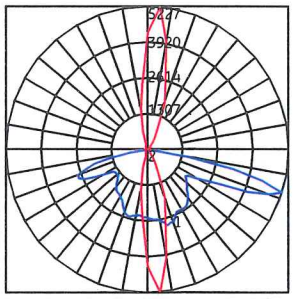
Polar Curve
Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

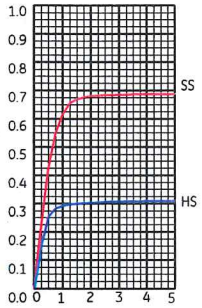
CU Graph
Coefficients of Utilization Street Width / Mounting Height

ERS1
Extra Narrow Asymmetric Medium (CXAX)

5,500 Lumens
5700K
GE454891.ies

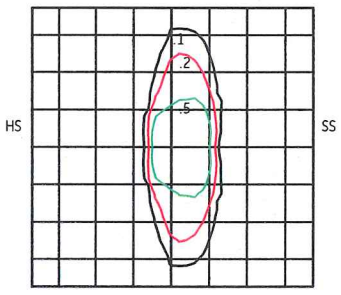


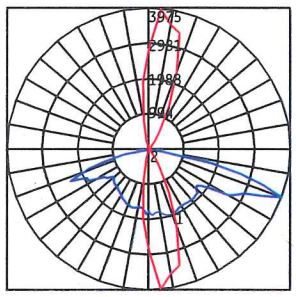


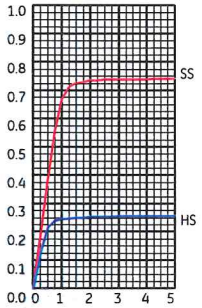


ERS1
Narrow Asymmetric Medium (CXBX)

5,700 Lumens
5700K
GE454666.ies

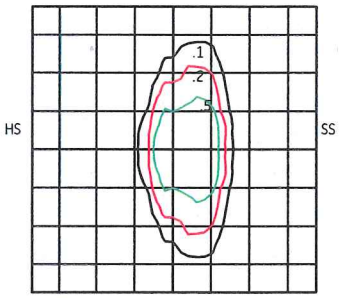


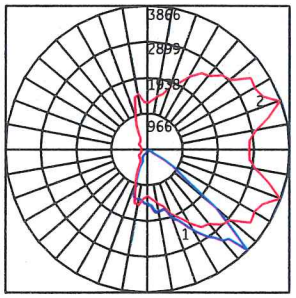


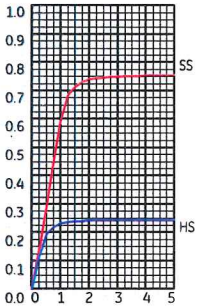


ERS1
Asymmetric Short (CXCX)

5,600 Lumens
5700K
GE454665.ies

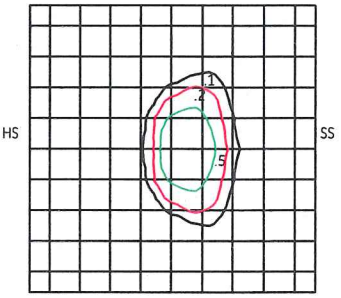


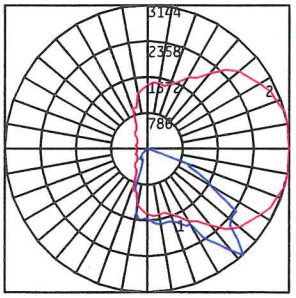


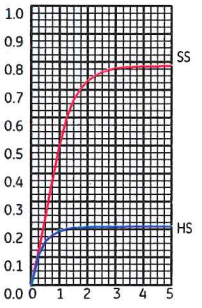


ERS1
Asymmetric Forward Very Short (CXDX)

5,700 Lumens
5700K
GE454897.ies

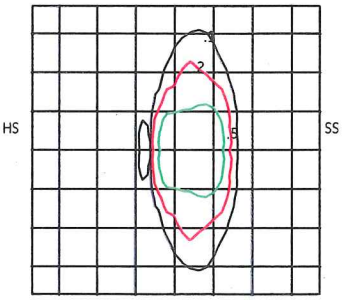


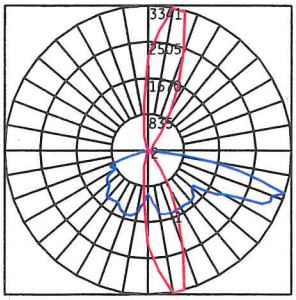


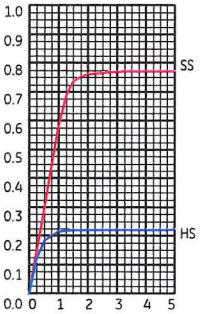


ERS1
Asymmetric Medium (CXEX)

5,400 Lumens
5700K
GE454646.ies







Ordering Number Logic

Scalable Cobrahead (ERS2)

E R S 2 _ _ _ _ - _ - _ _ - _ _ - _ - 5 - _ _ - _ - _ _ _ _ - _ _ _

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve **R** = Roadway **S** = Scalable **2** = Optical Assembly	**0** = 120 - 277 **H** = 347 - 480 **1** = 120* **2** = 208* **3** = 240* **4** = 277* **5** = 480* **D** = 347* *Specify single voltage only if fuse option is selected.		**AX** = Extra Narrow Asymmetric (Medium) **BX** = Narrow Asymmetric (Medium) **CX** = Asymmetric (Short) **DX** = Asymmetric Forward (Very Short) **EX** = Asymmetric (Medium)	**5** = 525mA* *Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.	**40** = 4000K **57** = 5700K	**1** = None **2** = PE Rec. **4** = PE Rec. with Shorting Cap **5** = PE Rec. with Control **7** = Dimming PE Receptacle *† **9** = Dimming PE Receptacle with Shorting Cap † PE control not available for multi-volt 347-480V. Must be a discrete voltage (347V or 480V). * Order dimming control PE as a separate item † When ordering PE function socket 7 or 9, a dimming option "D" or programmable dimming option "P" must also be ordered under the "OPTIONS" column	**BLCK** = Black **GRAY** = Gray Contact manufacturer for other colors.	**D** = Dimming (525mA) **E** = GE Level **F** = Fusing **L** = Tool-Less Entry **P** = Programmable Dimming (includes DALI) **T** = Extra Surge Protection* **XXX** = Special Options * Contact manufacturer for details and availability.

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 5700K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	IES FILE NUMBERS 4000K	IES FILE NUMBERS 5700K
DX		6000	6500	82	89	454898	454903
EX		7000	7500	94	102	454899	454904
FX	**AX**	8000	8600	106	114	454900	454905
GX		9000	9700	118	127	454901	454906
HX		10000	10800	130	140	454902	454907
DX		6300	6800	82	89	454684	454683
EX		7300	7900	94	102	454685	454682
FX	**BX**	8400	9000	106	114	454686	454681
GX		9400	10100	118	127	454687	454680
HX		10500	11300	130	140	454688	454643
DX		6200	6700	82	89	454675	454674
EX		7300	7800	94	102	454676	454673
FX	**CX**	8300	8900	106	114	454677	454672
GX		9300	10000	118	127	454678	454671
HX		10300	11100	130	140	454679	454641
DX		6300	6800	82	89	454908	454913
EX		7300	7900	94	102	454909	454914
FX	**DX**	8400	9000	106	114	454910	454915
GX		9400	10100	118	127	454911	454916
HX		10400	11200	130	140	454912	454917
DX		6000	6400	82	89	454658	454650
EX		6900	7400	94	102	454657	454649
FX	**EX**	7900	8500	106	114	454656	454647
GX		8800	9500	118	127	454655	454648
HX		9900	10600	130	140	454654	454642

House side photometry options available (using reverse facing light engines).
Contact manufacturer for more information.

Photometrics

Scalable Cobrahead (ERS2)

ISO Plot

Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

Polar Curve

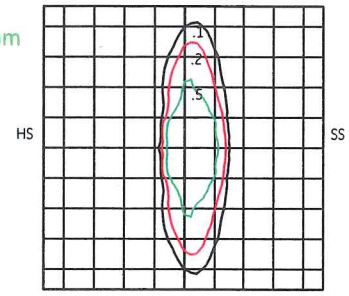
Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

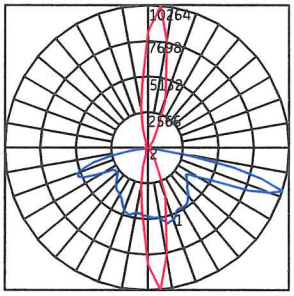
CU Graph

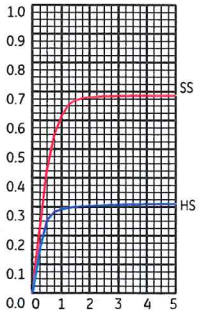
Coefficients of Utilization Street Width / Mounting Height

ERS2
Extra Narrow Asymmetric Medium (HXAX)

10,800 Lumens
5700K
GE454907.ies

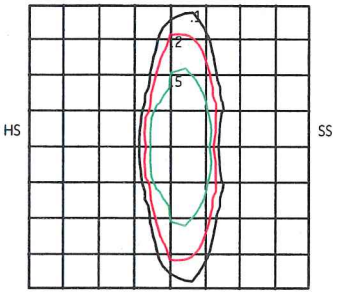


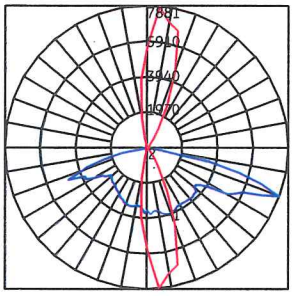


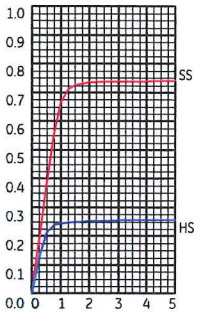


ERS2
Narrow Asymmetric Medium (HXBX)

11,300 Lumens
5700K
GE454643.ies

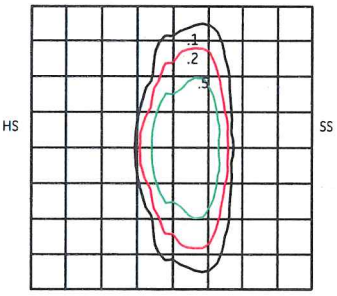


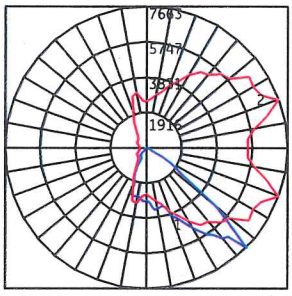


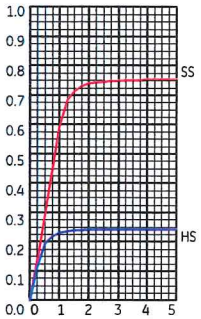


ERS2
Asymmetric Short (HXCX)

11,100 Lumens
5700K
GE454641.ies

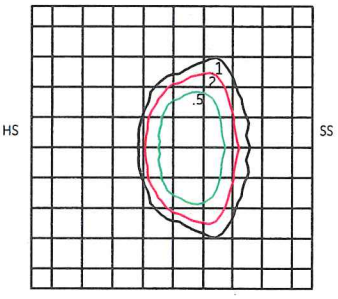


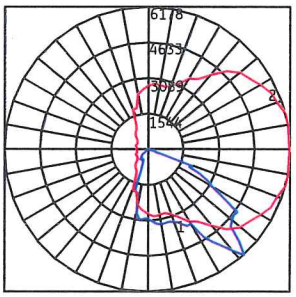


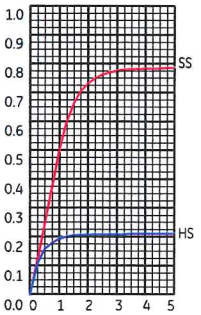


ERS2
Asymmetric Forward Very Short (HXDX)

11,200 Lumens
5700K
GE454917.ies

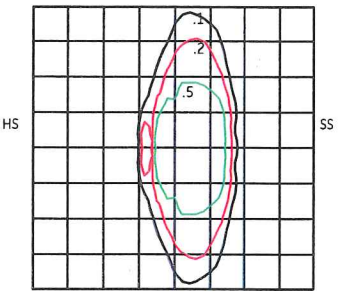


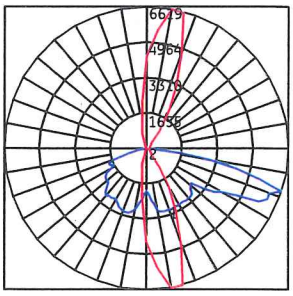


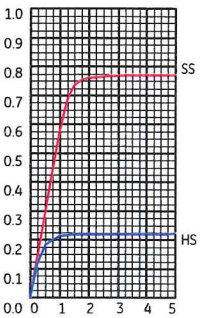


ERS2
Asymmetric Medium (HXEX)

10,600 Lumens
5700K
GE454642.ies

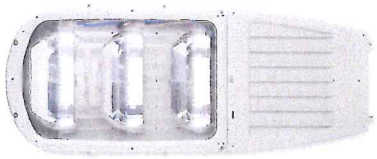






Ordering Number Logic

Scalable Cobrahead (ERS3)



ERS3 _ _ _ - _ - _ _ - _ _ - _ - 5 - _ _ - _ - _ _ _ _ - _ _ _

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve **R** = Roadway **S** = Scalable **3** = Optical Assembly	**0** = 120 - 277 **H** = 347 - 480 **1** = 120* **2** = 208* **3** = 240* **4** = 277* **5** = 480* **D** = 347* *Specify single voltage only if fuse option is selected.		**AX** = Extra Narrow Asymmetric (Medium) **BX** = Narrow Asymmetric (Medium) **CX** = Asymmetric (Short) **DX** = Asymmetric Forward (Very Short) **EX** = Asymmetric (Medium)	**5** = 525mA* *Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.	**40** = 4000K **57** = 5700K	**1** = None **2** = PE Rec. **4** = PE Rec. with Shorting Cap **5** = PE Rec. with Control **7** = Dimming PE Receptacle *† **9** = Dimming PE Receptacle with Shorting Cap † PE control not available for multi-volt 347-480V. Must be a discrete voltage (347V or 480V). * Order dimming control PE as a separate item † When ordering PE function socket 7 or 9, a dimming option "D" or programmable dimming option "P" must also be ordered under the "OPTIONS" column	**BLCK** = Black **GRAY** = Gray Contact manufacturer for other colors.	**D** = Dimming (525mA) **E** = GE Level **F** = Fusing **L** = Tool-Less Entry **P** = Programmable Dimming (includes DALI) **T** = Extra Surge Protection* **XXX** = Special Options * Contact manufacturer for details and availability.

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 5700K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	IES FILE NUMBERS 4000K	IES FILE NUMBERS 5700K
JX	AX	11100	11900	148	164	454918	454923
KX		12100	13000	159	177	454919	454924
LX		13100	14100	172	191	454920	454925
MX		14000	15000	183	204	454921	454926
NX		14800	15900	196	218	454922	454927
JX	BX	11600	12500	148	164	454928	454933
KX		12600	13600	159	177	454929	454934
LX		13700	14700	172	191	454930	454935
MX		14700	15800	183	204	454931	454936
NX		15500	16700	196	218	454932	454937
JX	CX	11400	12300	148	164	454938	454943
KX		12500	13400	159	177	454939	454944
LX		13500	14500	172	191	454940	454945
MX		14400	15500	183	204	454941	454946
NX		15300	16400	196	218	454942	454947
JX	DX	11500	12400	148	164	454958	454963
KX		12600	13600	159	177	454959	454964
LX		13700	14700	172	191	454960	454965
MX		14600	15700	183	204	454961	454966
NX		15400	16600	196	218	454962	454967
JX	EX	10900	11700	148	164	454948	454953
KX		11900	12800	159	177	454949	454954
LX		12800	13800	172	191	454950	454955
MX		13800	14800	183	204	454951	454956
NX		14500	15600	196	218	454952	454957

House side photometry options available (using reverse facing light engines).
Contact manufacturer for more information.

Photometrics

Scalable Cobrahead (ERS3)

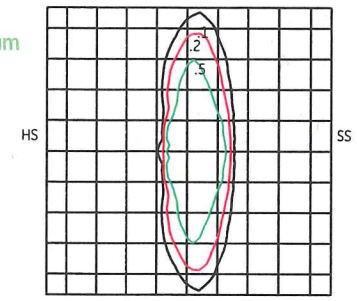
ISO Plot
Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

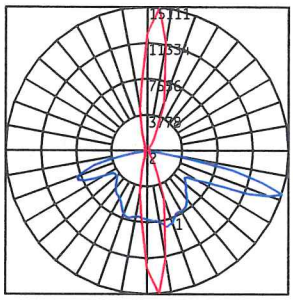
Polar Curve
Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

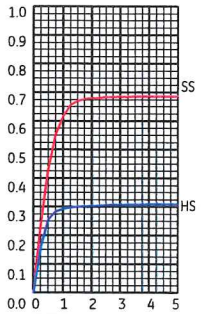
CU Graph
Coefficients of Utilization Street Width / Mounting Height

ERS3
Extra Narrow Asymmetric Medium (NXAX)

15,900 Lumens
5700K
GE454927.ies

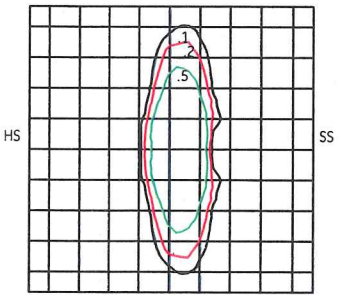


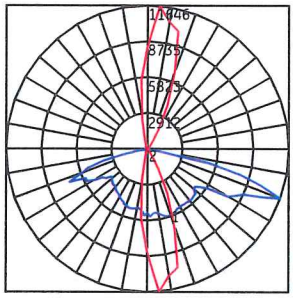


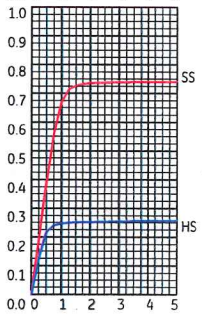


ERS3
Narrow Asymmetric Medium (NXBX)

16,700 Lumens
5700K
GE454937.ies

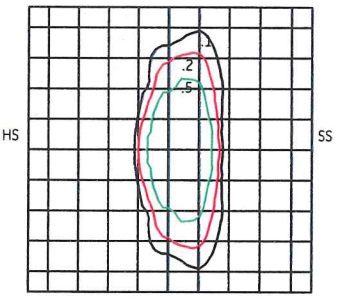


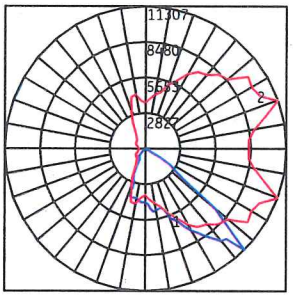


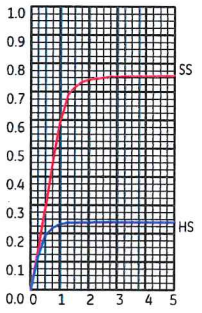


ERS3
Asymmetric Short (NXCX)

16,400 Lumens
5700K
GE454947.ies

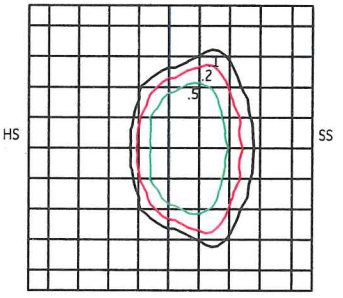


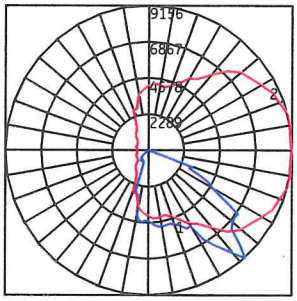


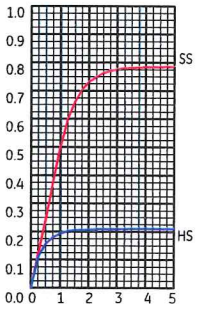


ERS3
Asymmetric Forward Very Short (NXDX)

16,600 Lumens
5700K
GE454967.ies

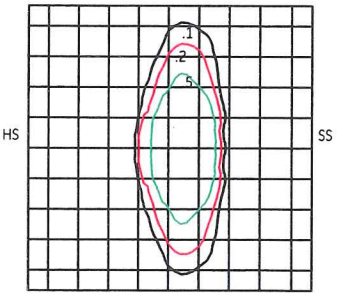


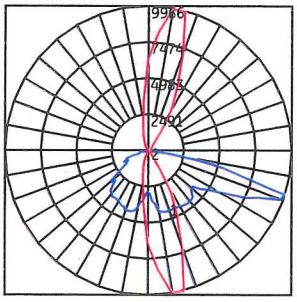


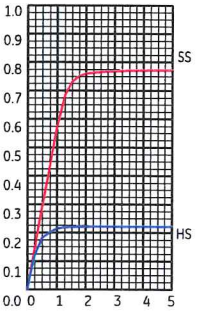


ERS3
Asymmetric Medium (NXEX)

15,600 Lumens
5700K
GE454957.ies







Ordering Number Logic

Scalable Cobrahead (ERS4)

E R S 4 _ _ _ _ - _ - _ _ - _ _ - 5 - _ _ - _ - _ _ _ _ - _ _ _

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
E = Evolve **R** = Roadway **S** = Scalable **4** = Optical Assembly	**0** = 120 - 277 **H** = 347 - 480 **1** = 120* **2** = 208* **3** = 240* **4** = 277* **5** = 480* **D** = 347* *Specify single voltage only if fuse option is selected.		**AX** = Extra Narrow Asymmetric (Medium) **BX** = Narrow Asymmetric (Medium) **CX** = Asymmetric (Short) **DX** = Asymmetric Forward (Medium) **EX** = Asymmetric (Medium)	**5** = 525mA* *Standard drive current is 525mA. 350mA and 700mA drive currents designated with a "3" or "7" respectively are available and set at the factory.	**40** = 4000K **57** = 5700K	**1** = None **2** = PE Rec. **4** = PE Rec. with Shorting Cap **5** = PE Rec. with Control **7** = Dimming PE Receptacle *† **9** = Dimming PE Receptacle with Shorting Cap † PE control not available for multi-volt 347-480V. Must be a discrete voltage (347V or 480V). * Order dimming control PE as a separate item † When ordering PE function socket 7 or 9, a dimming option "D" or programmable dimming option "P" must also be ordered under the "OPTIONS" column	**BLCK** = Black **GRAY** = Gray Contact manufacturer for other colors.	**D** = Dimming (525mA) **E** = GELevel **F** = Fusing **L** = Tool-Less Entry **P** = Programmable Dimming (includes DALI) **T** = Extra Surge Protection* **XXX** = Special Options * Contact manufacturer for details and availability.

OPTICAL CODE	PHOTOMETRIC TYPE	TYPICAL INITIAL LUMENS 4000K	TYPICAL INITIAL LUMENS 5700K	TYPICAL SYSTEM WATTAGE 120-277V	TYPICAL SYSTEM WATTAGE 347-480V	IES FILE NUMBERS 4000K	IES FILE NUMBERS 5700K
PX	AX	15900	17100	209	232	454968	454973
QX		16700	18000	222	246	454969	454974
RX		17600	18900	235	261	454970	454975
SX		18500	19900	244	271	454971	454976
TX		19400	20900	258	287	454972	454977
PX	BX	16600	17900	209	232	454978	454983
QX		17500	18800	222	246	454979	454984
RX		18400	19800	235	261	454980	454985
SX		19400	20900	244	271	454981	454986
TX		20400	21900	258	287	454982	454987
PX	CX	16400	17600	209	232	454988	454993
QX		17200	18500	222	246	454989	454994
RX		18100	19500	235	261	454990	454995
SX		19100	20500	244	271	454991	454996
TX		20000	21500	258	287	454992	454997
PX	DX	16600	17800	209	232	455008	455013
QX		17400	18700	222	246	455009	455014
RX		18300	19700	235	261	455010	455015
SX		19300	20800	244	271	455011	455016
TX		20300	21800	258	287	455012	455017
PX	EX	15600	16800	209	232	454998	455003
QX		16400	17600	222	246	454999	455004
RX		17300	18600	235	261	455000	455005
SX		18100	19500	244	271	455001	455006
TX		19100	20500	258	287	455002	455007

House side photometry options available (using reverse facing light engines). Contact manufacturer for more information.

Photometrics

Scalable Cobrahead (ERS4)

ISO Plot

Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

Polar Curve

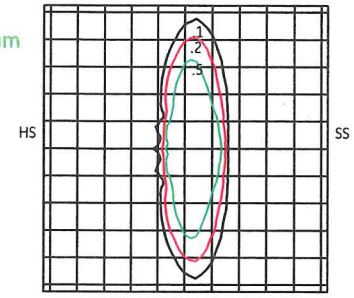
Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

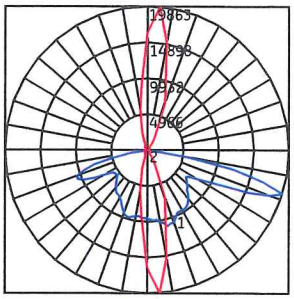
CU Graph

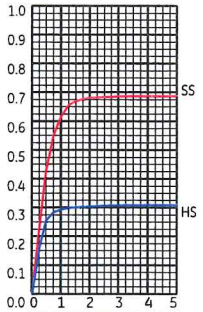
Coefficients of Utilization Street Width / Mounting Height

ERS4
Extra Narrow Asymmetric Medium (TXAX)

20,900 Lumens
5700K
GE454977.ies)

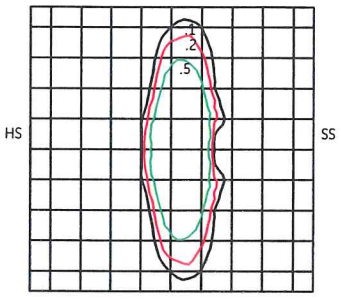


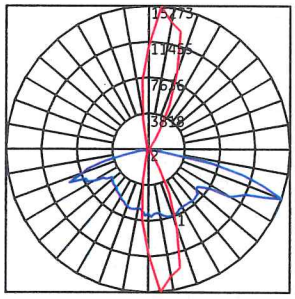


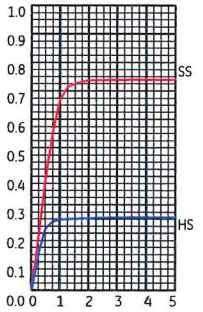


ERS4
Narrow Asymmetric Medium (TXBX)

21,900 Lumens
5700K
GE454987.ies

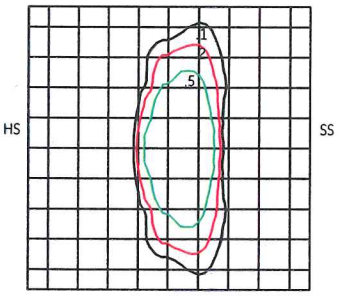


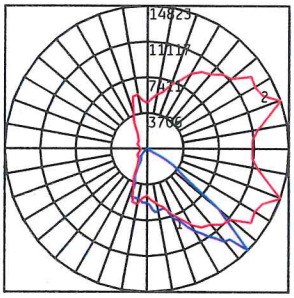


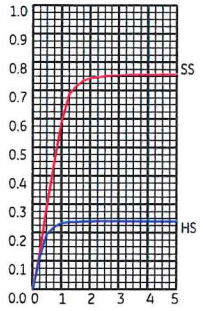


ERS4
Asymmetric Short (TXCX)

21,500 Lumens
5700K
GE454997.ies

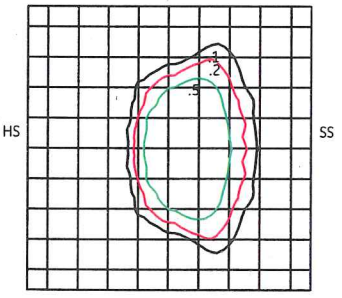


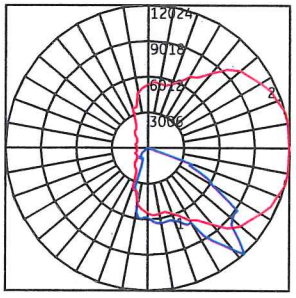


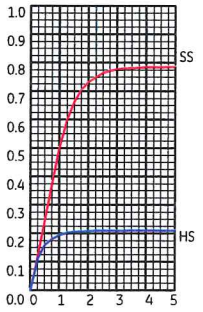


ERS4
Asymmetric Forward Very Short (TXDX)

21,800 Lumens
5700K
GE455017.ies

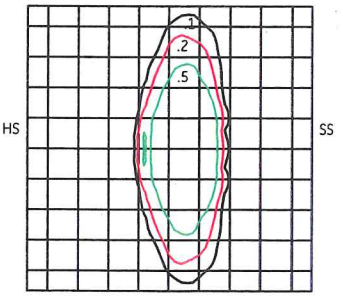


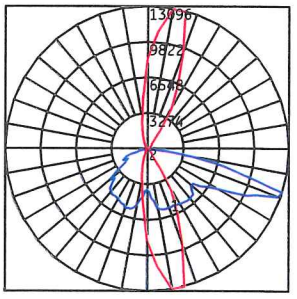


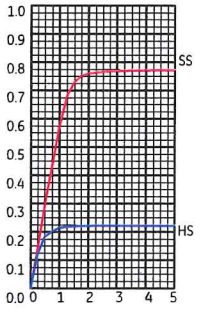


ERS4
Asymmetric Medium (TXEX)

20,500 Lumens
5700K
GE455007.ies

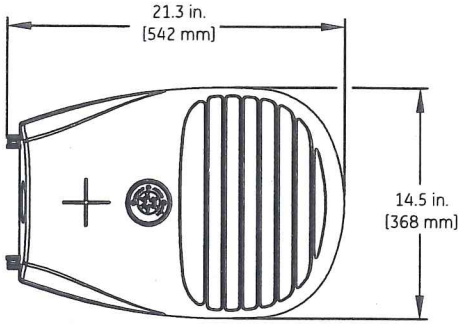


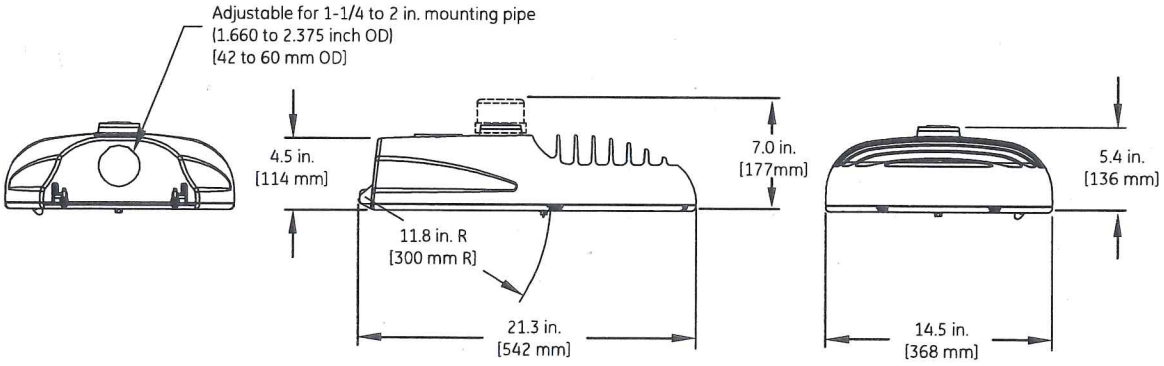




Product Dimensions

Scalable Cobrahead (ERS1)

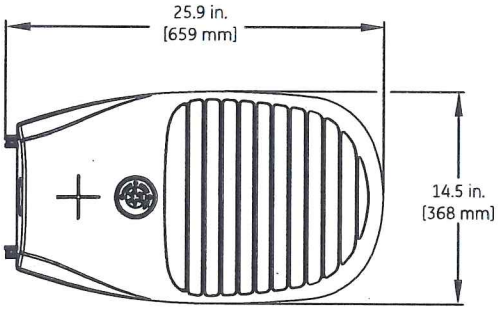


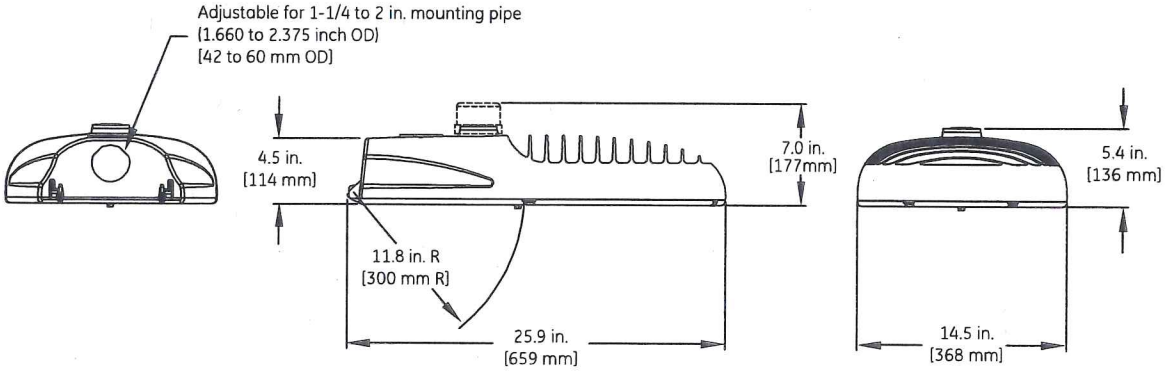


DATA

- Approximate Net Weight: 20 to 25 lbs. (9.07 to 11.34 kgs.) Contact manufacturer for specific configuration weight.
- Effective Projected Area (EPA): 0.5 sq. ft. max (0.046 sq. m)

Scalable Cobrahead (ERS2)



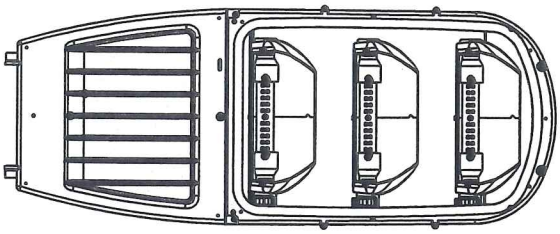


DATA

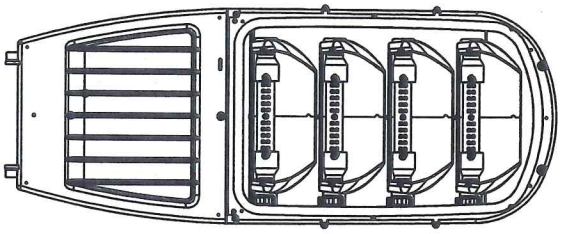
- Approximate Net Weight: 25 to 29 lbs. (11.34 to 13.15 kgs.) Contact manufacturer for specific configuration weight.
- Effective Projected Area (EPA): 0.7 sq. ft. max (0.065 sq. m)

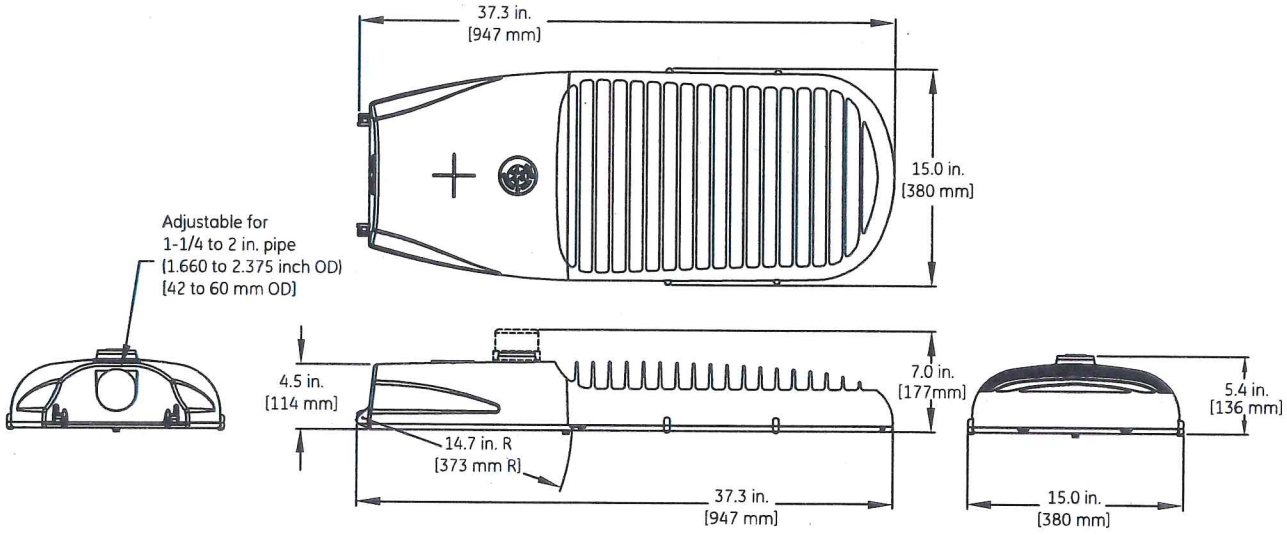
Product Dimensions

Scalable Cobrahead (ERS3)



Scalable Cobrahead (ERS4)





DATA

- Approximate Net Weight: 40 to 46 lbs. (18.14 to 20.87 kgs.) Contact manufacturer for specific configuration weight.
- Effective Projected Area (EPA): 1.0 sq. ft. max (0.093 sq. m)

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Job Name: _____

Type: _____

Complete Catalog Number: _____

LED GREEN Cobra™ Street Light

Ordering Example

Select	Select	Select	NW	Select	GY	
GC1 – LED Street Light GCD1 – LED Street Light Dimmable GCA1[1] – LED Street Light GCAD1[1] – LED Street Light Dimmable	Number/ Type of LEDs 20E 30E 40E 60E 80E	Voltage MV - 120-277V HV - 347-480V	Nominal Color Temperature[2] NW – 4300K	Light Distribution 2 - Type 2 3 - Type 3	Finish[3] GY - Gray	Accessories/Options **BSK** - Bird Spider Kit **SPB** - Square Pole Bracket **RPB** - Round Pole Bracket **PTB** - Pole-Top Bracket **HSS**[4] – House Side Shield **350** - Factory set 350mA Drive Current **530** - Factory set 530mA Drive Current **FDC**[5]- Fixed Drive Current

Notes:
1. Meets Buy American Provision of ARRA
2. NW standard. Consult factory for other color temperatures.
3. Gray standard. Consult factory for other finishes.
4. Flush mounted shield easily field installed. Cuts light off ½ mounting height behind luminaire.
5. Non-field adjustable drive current. Specify setting - 350mA, 530mA, or 700mA.

Luminaire Specifications

Housing: Die cast aluminum housing with universal four-bolt slip fitter mounts to 11/4 " to 2" (15/8" to 23/8" O.D.) diameter mast arm. Cooling fins maintain LED junction temperature assuring long LED life and efficiency. Electrical components are accessed without tools and are mounted on removable power door. Power door features quick electrical disconnects to terminal block and LED board. Photocontrol receptacle is standard and can be aimed without tools. Photocontrol is provided by others.

Light Emitting Diodes: Hi-flux/Hi-power white LEDs produce a minimum of 95% of initial intensity at 100,000 hours of life. LEDs are tested in accordance with IESNA LM-80 testing procedures. They have a mean correlated color temperature of 4300K (standard). LEDs are 100% mercury and lead free.

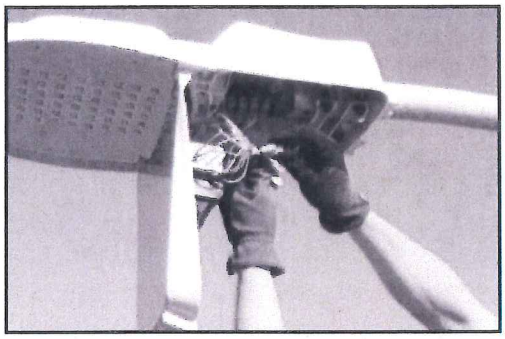
Optical Systems: Micro-lens systems produce IESNA Type 2 or Type 3 distributions. Luminaire is classified as Full-Cutoff with 0% total lumens above 90°.

Electrical: Power supply features a minimum power factor of .90 and <20% Total Harmonic Distortion (THD). EMC meets or exceeds FCC CFR Part 15. Transient voltage complies with ANSI C62.41 Cat. A. Power supply is field adjustable to 350mA, 530mA, or 700mA drive current. Standard factory setting is 700mA. Integral surge protector is tested per ANSI/IEEE C62.45 procedures based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for Location Category C-High.

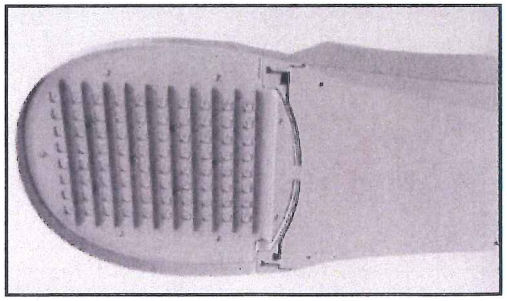
Finish: Housing receives a fade and abrasion resistant, epoxy polyester powder coat, light gray finish standard.

Listings/Ratings/Warranties/Patents: Luminaires are UL listed for use in wet locations in the United States and Canada. Optical systems maintain an IP66 rating. Ten-year limited warranty is standard on all components. Patents pending.

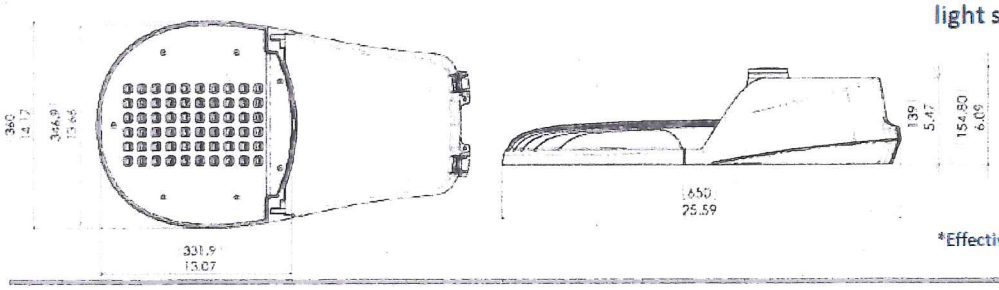
Photometry: All luminaires are photometrically tested by certified independent testing laboratories in accordance with IESNA LM-79 testing procedures.



Removable "power door" opens without tools and hangs securely during wiring.



Optional House Side Shield plate with back light strips is factory or field installable.



Weight	EPA*
21 lbs. (9kg)	0.9ft²

*Effective Projected Area (consult factory for multiple units)

LED GREEN Technology

GCA units are manufactured in USA and meet Buy American requirements within the ARRA.

RoHS Compliant

Leotek Electronics USA Corp.
726 South Hillview Drive | Milpitas, CA 95035 | 408.380.1788 | www.leotek.com