



Street Lighting Audit Report

Prepared for

City of Culver City Street Lighting

Prepared by

The Energy Network

Audit Performed by

kW Engineering

Date

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Version 1

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1. Summary

The Energy Network is pleased with the opportunity to provide this street lighting audit report to the City of Culver City (Agency). The Energy Network, administered by Los Angeles County, was created by the California Public Utilities Commission to help eligible public agencies in Southern California harness their collective action, save energy, reduce operating costs and protect precious resources. To expand public agency participation in utility energy efficiency programs, The Energy Network is offering an unprecedented level of services including turnkey energy retrofit services, such as this proposed street lighting retrofit project.

This report describes a recommended retrofit of the Agency's 1,184 LS-2 (unmetered) cobra-head streetlights with 651 induction cobra-head fixtures and 533 LED cobra-head fixtures, as well as 307 LS-2 (unmetered) decorative post top streetlights with 307 energy efficient, long-lasting decorative post top LED fixtures. Based on the street lighting inventory provided and the replacement fixtures selected, replacing the existing luminaires with induction and LEDs fixtures have the potential to save the Agency 970,771 kWh and \$119,001 per year in avoided energy cost.

2. Recommended Fixtures

LED and induction streetlights have many advantages over the existing high-intensity discharge (HID) luminaires. In addition to requiring significantly lower costs of operation and maintenance, LED and induction fixtures offer improved color rendering. LEDs provide greater directionality and uniformity. Furthermore, LEDs are broad spectrum light sources, which have a higher perceived brightness when compared to conventional light sources in street lighting applications. Finally, LED streetlights typically allow for easy dimming, which affords the opportunity for even greater potential energy savings down the road, if adaptive lighting strategies are implemented. Similar to LED fixtures induction fixtures also have a longer life than the existing HID fixtures and provide better light levels while consuming less power.

The Energy Network's engineering consultant, kW Engineering, has proposed induction and LED luminaires to replace the existing HID luminaires as listed in Table 1. To arrive at the recommended fixtures, kW Engineering referenced the list of fixtures approved by the City of Los Angeles for their city-wide Cobrahead Replacement Program. Drawing from this list, kW Engineering then chose cost-effective replacement LED luminaires, which were shown through photometric analysis to be suitable replacements for the existing HID luminaires. The recommended fixtures are all specified with a correlated color temperature (CCT) of 4100K, as preferred by the Agency.

Appendix A: List of Fixtures Selected by the City of Los Angeles for their Cobrahead Replacement Program

provides basic information on the City of Los Angeles' Cobrahead Replacement Program, as well as a list of fixtures approved by the city.

Table 1: Recommended Street Lighting Measures

Existing Fixture Type	Existing Fixture Wattage (Nominal)	Recommended LED/Induction Retrofit Fixture Brand and Model	Recommended LED/Induction Retrofit Wattage	Number of Fixtures to be Replaced
HPS	150	Cree BXSP-B-HT-XXX-B-40K	68	145
HPS	200	Cree BXSP-B-HT-XXX-B-40K	87	5
HPS	250	Cree BXSP-C-HT-XXX-E-40K	101	36
HPS	400	Cree BXSP-C-HT-XXX-F-40K	139	11
MV	100	Cree BXSP-B-HT-XXX-A-40K	25	101
MV	175	Cree BXSP-B-HT-XXX-A-40K	42	197
MV	250	Cree BXSP-B-HT-XXX-B-40K	68	8
MV	400	Cree BXSP-B-HT-XXX-B-40K	87	30
HPS	50	*Crystal CLP-ACRN3-40CLED	45	23
HPS	70	*Crystal CLP-ACRN3-40CLED	45	169
HPS	100	*Crystal CLP-ACRN3-40CLED	45	115
HPS	50	Crystal VL-CLP-CH29 40	40	2
HPS	70	Crystal VL-CLP-CH29 40	40	19
HPS	100	Crystal VI-CLP-CH29 65	65	21
HPS	150	Crystal VI-CLP-CH29 80	80	33
HPS	200	Crystal VI-CLP-CH36 120	120	36
HPS	250	Crystal VI-CLP-CH36 120	120	207
HPS	310	Crystal VI-CLP-CH36 200	200	1
HPS	400	Crystal VI-CLP-CH36 250	250	70
MV	100	Crystal VL-CLP-CH29 65	65	18
MV	175	Crystal VL-CLP-CH29 80	80	24
MV	250	Crystal VL-CLP-CH36 120	120	65
MV	400	Crystal VL-CLP-CH36 250	250	148
MV	700	Crystal VL-CLP-CH36 250	250	1
MV	1000	Crystal VL-CLP-CH36 250	250	6
			Total	1,491

*Crystal Lighting to provide shield inside the interior of the Post Top LED fixtures for Dark-Sky Compliance of fixtures and to reduce light pollution

This list of fixtures to be replaced was created using the city's LS-2 inventory, as provided by Southern California Edison (SCE). Manufacturer specification sheets for all of the LED replacement luminaires can be found in Appendix B: Manufacturer Specifications for Recommended Fixtures.

3. Energy Savings and Financial Analysis

The energy and cost savings of the project are summarized in Table 2. This project is expected to realize an estimated annual electricity savings of 970,771 kWh – a savings of approximately 63% of electricity usage for the streetlights being proposed in this project. Additionally, this project will have cost savings from avoided maintenance expenses by not having to replace the existing HID lighting equipment. While the avoided maintenance cost was not included in Table 2 below, we estimate the amount to be an additional 2% of the total project cost.

Table 2: Energy and Cost Savings

Baseline Electric Usage (kWh/yr)	Electric Savings (kWh)	Annual Electric Cost Savings ² (\$/yr)
1,533,523	970,771	\$119,001

Table 3 provides a breakdown of estimated project cost components and a summary of cost-effectiveness evaluation metrics.

The project costs covered by the Agency include construction, and all NJPA processing fees equal to \$750,980. When subtracting out available incentives, the Net Construction cost to your agency is \$584,671.

Table 3: Financial Benefits of Energy Network Services

Project Costs	Gross Project Costs (\$)	Total Incentives (\$)	Net Project Costs (\$)	Net Present Value ^{1,2} (NPV)	Savings-to-Investment Ratio ³	Return on Investment ⁴ (ROI)	Simple Payback ⁵ (years)
Total Project Cost	\$750,980	\$166,309	\$584,671	\$1,120,867	2.38	112%	4.9

1 The net present value (NPV) is the difference between the present value of cash inflows (one time incentive rebate and annual energy and non-energy savings) and the present value of cash outflows (annual lease or finance payments for project costs) over 15 years, or the effective useful life (EUL) of the LED and Induction streetlights. NPV assumes energy cost savings and project costs in the detailed audit calculations. Per CEC Proposition 39: Net Present Value = Energy Cost Savings + Maintenance Savings

2 The default discount rate, utility rate inflation, maintenance cost savings, and inflation are taken into account per CEC Proposition 39 guidelines.

3 Per CEC Proposition 39: Savings-to-Investment Ratio (SIR) = NPV/(Project Installation Cost – Incentives – Other Grants – Non-energy Benefits). TEN does not use "Non-energy Benefits" in its financial models.

4 ROI = [Annual Cost Savings (\$/yr) - Project Cost] / Project Cost (\$)

5 Simple Payback (years) = Net Project Cost (\$) / Annual Cost Savings (\$/yr)



This analysis assumes that the Agency takes advantage of outside financing options. This project has a positive net present value (NPV) of \$1,120,867 and a simple payback period of 4.5 years.

The project can be paid for either through SCE's zero percent APR On-Bill Financing (OBF) or with the County of Los Angeles' Energy Project Lease Financing. The agency decided to use SCE's on bill financing and the OBF application has been approved. If fully financed through OBF, the loan term will be approximately 4.5 years, with monthly on-bill payments of \$9,744.

4. Project Assumptions

The following assumptions were used to develop the energy savings and cost estimates in this Audit Report.

Table 4: LED Installed Cost Estimates

Model	Description	Installed Price
Cree BXSP-B-HT-XXX-B-40K	68W LED (replacing 150W HPSV)	\$535.95
Cree BXSP-B-HT-XXX-B-40K	87W LED (replacing 200W HPSV)	\$535.95
Cree BXSP-C-HT-XXX-E-40K	101W LED (replacing 250W HPSV)	\$453.42
Cree BXSP-C-HT-XXX-F-40K	139W LED (replacing 400W HPSV)	\$613.34
Cree BXSP-B-HT-XXX-A-40K	25W LED (replacing 100W MV)	\$407.00
Cree BXSP-B-HT-XXX-A-40K	42W LED (replacing 175W MV)	\$407.00
Crystal CLP-ACRN3-40CLED	45W LED (replacing 50W HPSV)	\$561.29
Crystal CLP-ACRN3-40CLED	45W LED (replacing 70W & 100W HPSV)	\$561.29
Crystal VL-CLP-CH29 40	40W IND (replacing 50W & 70W HPSV)	\$319.71
Crystal VI-CLP-CH29 65	65W IND (replacing 100W HPSV & MV)	\$343.66
Crystal VI-CLP-CH29 80	80W IND (replacing 150W HPSV & 175W MV)	\$357.20
Crystal VI-CLP-CH36 120	120W IND (replacing 250W HPSV & MV)	\$509.24
Crystal VI-CLP-CH36 200	200W IND (replacing 310W HPSV)	\$536.32

6 The net present value (NPV) is the difference between the present value of cash inflows (one time incentive rebate and annual energy and non-energy savings) and the present value of cash outflows (annual lease or finance payments for project costs) over 15 years, or the effective useful life (EUL) of the LED and Induction streetlights. NPV assumes energy cost savings and project costs in the detailed audit calculations. Per CEC Proposition 39: Net Present Value = Energy Cost Savings + Maintenance Savings

7 The default discount rate, utility rate inflation, maintenance cost savings, and inflation are taken into account per CEC Proposition 39 guidelines.

8 Per CEC Proposition 39: Savings-to-Investment Ratio (SIR) = NPV/(Project Installation Cost – Incentives – Other Grants – Non-energy Benefits). TEN does not use "Non-energy Benefits" in its financial models.

9 ROI = [Annual Cost Savings (\$/yr) - Project Cost] / Project Cost (\$)

10 Simple Payback (years) = Net Project Cost (\$) / Annual Cost Savings (\$/yr)

Crystal VI-CLP-CH36 250	250W IND (replacing 400W HPSV & 400W, 700W and 100W MV)	\$536.32
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- Installed price is from the Comet Electric Contractor Price Proposal, A14CSL08 – Culver City Street Lighting (Original Scope), dated September 17, 2015. It includes materials, installation, miscellaneous expenses, and contractor markup.
- The estimated useful life of the LED fixture is 65,000 hours or ~15 years.
- The estimated useful life of the Induction fixture is 100,000 hours or ~ 20 years.
- Maintenance savings are assumed to be 2% of project costs, per CEC Prop 39
- \$0.215 per kWh (\$0.08 / kWh base rate + partnership kicker \$0.135 / kWh, gold)
- Electricity escalation rate is 4%/yr, per CEC Prop 39
- Discount rate for NPV is 5%, per CEC Prop 39

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Appendix A: List of Fixtures Selected by the City of Los Angeles for their Cobrahead Replacement Program

The City of Los Angeles performed a rigorous, multi-year assessment of products from several major manufacturers, evaluating and selecting the highest performing LED fixtures for their 140,000 HPS streetlight retrofit program. The City tested 19 criteria ranging from photometric quality to mechanical reliability.⁶ The following is the City of Los Angeles' most current list of approved LED fixtures:

		Approved Luminaires	Catalog Number	Power
Local Streets: Type II	70W HPS	Cree 004Cedway 20D Cree Ledway 30C (superseded)	BXSL9234LA& STR-LWY-2S-HT-02-D-UL-SV-350-N-R-40K STR-LWY-2M-HT-03-C-UL-SV-N-R-43K	25 W 55 W
	100W HPS	Cree Ledway 30D Leotek GreenCobra 30E Hadco 32 Cree Ledway 40C (superseded) Leotek GreenCobra 40C (superseded)	BXSL9215LA& STR-LWY-2S-HT-03-D-UL-SV-350-N-R-40K GC1-30E-MV-NW-2-GY-350 RX132I2NAMRNAN STR-LWY-2M-HT-04-C-UL-SV-43K-R GC1-40C-MV-NW-2X-GY	35 W 36 W 52 W 70 W 68 W
Collector Streets: Type II	150W HPS	Cree XSP2 @ E (mid-block) Leotek GreenCobra 40E @ 700mA Leotek GreenCobra 40E @ 700mA W/DCM Cree Ledway 50D Cree Ledway 60C (superseded) Leotek GreenCobra 60C (superseded)	BXSP9002\$-E BXSPA03HE - USQR GC1-40E-MV-NW-2-GY-700 GC1-40E-MV-NW-2-GY-700-RDCM BXSL9184LA& STR-LWY-2M-HT-05-D-UL-SV-525-N-R-40K STR-LWY-2M-HT-06-C-UL-SV-43K-R GC1-60C-MV-NW-2M-GY	64 W 95 W 95 W 84 W 113 W 105 W
Major Streets: Type III	200W HPS	Leotek Ecobra 11M Cree XSP2 @ C (mid-block) American Electric 40B @ 700mA Cree Ledway 60D @ 700mA Cree Ledway 60D @ 700mA w/DCM Leotek GreenCobra 60E @ 700mA Leotek GreenCobra 60E @ 700mA w/DCM Leotek GreenCobra 80C (superseded) Cree Ledway 80C (superseded)	EC3-11M-MV-NW-3-GY-650 BXSP9002\$-C BXSPA03HC - USQR ATB2 40BLEDE70 MVOLT R3 BXSL9191LA& STR-LWY-3M-HT-06-D-UL-SV-700-N-R-40K BXSL9174LA& STR-LWY-3M-HT-06-D-UL-SV-700-N-R-40K- ROAM GC1-60E-MV-NW-3-GY-700 GC1-60E-MV-NW-3-GY-700-RDCM GC1-80C-MV-NW-3M-GY STR-LWY-3M-HT-08-C-UL-SV-43K-R	89 W 82 W 91 W 139 W 139 W 136 W 136 W 136 W 140 W
	250W HPS	Leotek Ecobra 14M @ 525mA Cree XSP2 @ A (mid-block) Leotek GreenCobra 90E	EC4-14M-MV-NW-3-GY-530 BXSP9002\$-A BXSPA03HA - USQR GC2-90E-MV-NW-3-GY-530	98 W 101 W 159 W

⁶ The City of Los Angeles Bureau of Street Lighting evaluated streetlights against 19 criteria, including luminaire mechanical and electrical build quality, various illuminance and photometric criteria, maintenance and life expectancy, driver access, light trespass, and discomfort glare among others. For the full report, please visit: <http://bsl.lacity.org/led-contractors-vendors.html>.

	310W HPS	Leotek Ecobra 18M @525mA Leotek GreenCobra 100E Cree XSP2L @ O (mid-block) Cree Ledway 90D Cree Ledway 120C (superseded)	EC7-18M-MV-NW-3-GY-530 GC2-100E-MV-NW-3-GY-530 BXSP9024&-O BXSPA03HO - USQR BXSL9192LA& STR-LWY-3M-HT-09-D-UL-SV-525-N-R-40K STR-LWY-3M-HT-12-C-UL-SV-43K-R	117 W 175 W 114 W 149 W 221 W
	400W HPS	Leotek Ecobra 18M @700mA Leotek GreenCobra 120E Cree XSP2L @ L (mid-block) Cree Ledway 120D Hadco RX 120	EC7-18M-MV-NW-3-GY-700 GC2-120E-MV-NW-3-GY-530 BXSP9024&-L BXSPA03HL - USQR BXSL9183LA& STR-LWY-3M-HT-12-D-UL-SV-525-N-R-40K RX2120I3NA5RNAN	157 W 207 W 168 W 195 W 208 W
	400W HPS+	American Electric 80B @1000mA Hadco RX 160	ATB2 80BLEDE10 MVOLT R3 4K RX2160I3NA5RNAN	280 W 275 W

Appendix B: Manufacturer Specifications for Recommended Fixtures

XSP1™ IP66 — BXSPA23

XSP Series LED Street Light – IP66 – Single Module
Horizontal / Vertical Tenon Mount – Type III

Product Description

Designed from the ground up as a totally optimized LED street light system, the XSP Series delivers incredible efficiency 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

Nano Optic® Precision Delivery Grid™ optic

CRI: Minimum 70 CRI

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

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

Accessories

Field Installed Accessories
XA-XSP FTRKIT - Filter kit to mount to 1.25" (32mm) tenon



Ordering Information

Example: BXSPA23GA-US-OPTIONS

BXSP	A	2	3		A	-			
Product	Version	Mounting	Optic	Modules	Input Power Designator	-	Voltage	Color Options	Options
BXSP	A	2 Horizontal / Vertical Tenon	3 Type III	G 4000K N 5700K	A 52W	-	U Universal 120-277V V 347-480V*	S Silver (Standard) T Black Z Bronze B Platinum Bronze W White	F Fuse - When code details 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 G option - Refer to Field Adjustable Output spec sheet for details G Field Adjustable Output - Refer to Field Adjustable Output spec sheet for details R NEMA Photocell Receptacle - Photocell by others U Utility - Label per ANSI C136.15 - Includes exterior wattage label that indicates the maximum available wattage of the luminaire - Includes G option - Refer to Field Adjustable Output spec sheet for details

* See www.cree.com/lighting/products/warranty for warranty terms.

* 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.



www.cree.com/lighting



T (800) 236-6800 F (262) 504-5415

Rev. Date: 06/27/15



XSPI™ IP66 — BXSPA23

Product Specifications

CONSTRUCTION & MATERIALS

- Die cast aluminum housing
- Tool-less entry
- Luminaire is designed to mount to 2" IP (2.375" [60mm] O.D.) tenons accommodating tenons up to 2.5" (64mm) in diameter
- Luminaire will also mount to 1.25" (32mm) IP, (1.66" [42mm] O.D.) tenon with XA-XSPFTRKIT accessory
- Fitter is capable of mounting to both vertical and horizontal tenons and can be tilted + / - 5°
- Designed with 0-10V dimming capabilities. Controls by others
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable 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

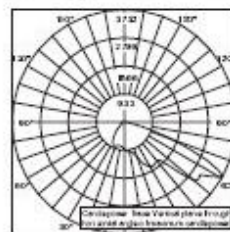
- Input Voltage: 120-277V or 347-480V, 50 / 60Hz
- Class 2 output
- Power Factor: > 0.9 at full load
- Total Harmonic Distortion: < 20% at full load
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C / D breaker should be used

REGULATORY & VOLUNTARY QUALIFICATIONS

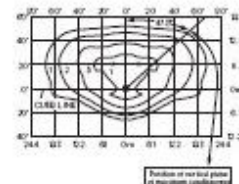
- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529
- Pending certification to ANSI C36.31-2001 3G bridge and overpass vibration standards
- 10kV surge suppression protection tested in accordance with IEEE / ANSI C62.412
- Pending CALTRANS 6T1 Vibration testing
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ARRA

Photometry

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



ITL Test Report #: 76867
BXSPA3GA-U
Initial Delivered Lumens: 4,806



BXSPA3GA-U
Mounting Height: 25' (7.6m)
Initial Delivered Lumens: 4,806
Initial FC at grade

EPA and Weight

Weight 120-277V	Weight 347-480V	EPA				
		1@90	2@90	2@180	3@90	4@90
27.2 lbs (12.5kg)	30.2 lbs (13.7kg)	0.95	1.02	1.30	2.25	2.42

Lumen Output, Electrical, and Lumen Maintenance Data

Type III Distribution													
Input Power Designator	4000K		5700K		System Watts 120-277V	System Watts 347-480V	TOTAL CURRENT						50K Hours Calculated Lumen Maintenance Factor @ 15°C (59°F)***
	Initial Delivered Lumens*	BUG Ratings** Per TM-E-11	Initial Delivered Lumens*	BUG Ratings** Per TM-E-11			120V	208V	240V	277V	347V	480V	
A	4,806	B1 UO G1	5,340	B1 UO G1	52	58	0.44	0.25	0.22	0.20	0.17	0.15	93%

* Actual production yield may vary between -4 and +10% of initial delivered lumens.

** For more information on the IES BUG (Backlight-Uplight-Glare) Rating, visit www.iesna.org/PDF/EI/ratings/TM-15-II/bugRatingsAddendum.pdf.

*** For recommended lumen maintenance factor data see TD-13. Calculated Lx based on 6,000 hours LM-79-08 testing; > 100,000 hours.

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XSP Series

XSP2™ and XSP2L™ IP66 LED Street/Area Luminaire – Double Module – Version A

Product Description

Designed from the ground up as a totally optimized LED street light system, the XSP Series delivers incredible efficiency 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.

Applications: Roadway, parking lots, walkways and general area spaces

Performance Summary

Utilizes BetaLED® Technology

NanoOptic® Precision Delivery Grid™ optic

CRI: Minimum 70 CRI

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

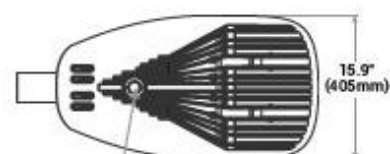
Limited Warranty*: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

* See www.cree.com/lighting/products/warranty for warranty terms

Accessories

Field-Installed

Filter Kit
XA-XSPFTRKIT
- Mounts to 1.25" (32mm) IP Tenon



NEMA® Photo cell Receptacle location
(ordered as an option)

Ordering Information

Example: BXS PA22HA-US

BXSP	A	2				-			
Product	Version	Mounting	Optic	Module	Input Power Designator	-	Voltage	Color Options	Options
BXSP	A	2 Horizontal/ Vertical Tenon	2 Type II F Type II Short 3 Type III P Type III EU	H 4000K P 5700K	A 101W L 160W - Available with U Voltage only	-	U Universal 120-277V V+ 347-480V	S Silver T Black Z Bronze B Platinum Bronze W White	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® Photo cell Receptacle - Includes Q option - Refer to Field Adjustable Output spec sheet for details Q Field Adjustable Output - Refer to Field Adjustable Output spec sheet for details R NEMA® Photo cell Receptacle - Photocell by others U Utility - Label per ANSI C136.15 - 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

* 347-480V utilizes magnetic step-down transformer. For input power for 347-480V, refer to the Electrical Data table



US: www.cree.com/lighting

T (800) 236-6800 F (262) 504-5415

Rev. Date: V1 01/27/2015



XSP2™ and XSP2L™ IP66 LED Street/Area Luminaire – Double Module – Version A

Product Specifications

CONSTRUCTION & MATERIALS

- Die cast aluminum housing
- Tool-less entry
- Luminaire is designed to mount to 2" IP (2.375" [60mm] O.D.) tenon, accommodating tenons up to 2.5" (64mm) in diameter
- Luminaire will also mount to 1.25" (32mm) IP (1.66" [42mm] O.D.) tenon with XA-XSPFTRKIT accessory
- Fitter is capable of mounting to both vertical and horizontal tenons and can be tilted +/- 5°
- Input Power Designator A designed with 0-10V dimming capabilities. Controls by others
- Input Power Designator L includes Field Adjustable Output
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, black, bronze, platinum bronze and white are available
- Weight: 101W: 120-277V: 32.5 lbs. (14.7kg); 347-480V: 36.5 lbs. (16.5kg)
168W: 120-277V: 35.0 lbs. (15.8kg)

ELECTRICAL SYSTEM

- Input Voltage: 120-277V or 347-480V 50/60Hz
- Power Factor: > 0.9 at full load
- Total Harmonic Distortion: < 20% at full load
- Class 2 driver
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/O breaker should be used
- Source Current: 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529
- Certified to ANSI C136.31-2001, 30 bridge and overpass vibration standards
- Meets CALTRANS 611 Vibration testing
- 10kV surge suppression protection tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15 standards for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ABRA
- DLC qualified when ordered with 2, For 3 optics. Exceptions apply when N, U, or Q options are ordered. Please refer to www.designlights.org/DPL for most current information
- RoHS compliant. Consult factory for additional details

Electrical Data*

Input Power Designator	System Watts 120-277V	System Watts 347-480V	Total Current					
			120V	208V	240V	277V	347V	480V
A	101	106	0.86	0.49	0.43	0.38	0.30	0.23
L	168	N/A	1.71	1.01	0.89	0.78	N/A	N/A

* Nominal data at 25°C (77°F)

Recommended Cree® XSP Series Version A Lumen Maintenance Factors (LMF)¹

Ambient	Input Power Designator	Initial LMF	25K hr Projected ² LMF	50K hr Projected ² LMF	75K hr Projected ² / Calculated ³ LMF	100K hr Calculated ³ LMF
5°C (41°F)	A ¹	1.04	1.02	1.01	1.00	1.00
	L ¹	1.04	0.97	0.91	0.85	0.79
10°C (50°F)	A ¹	1.03	1.01	1.00	0.99	0.99
	L ¹	1.03	0.96	0.90	0.84	0.79
15°C (59°F)	A ¹	1.02	1.00	0.99	0.98	0.98
	L ¹	1.02	0.95	0.89	0.83	0.78
20°C (68°F)	A ¹	1.01	0.99	0.98	0.97	0.97
	L ¹	1.01	0.94	0.88	0.82	0.77
25°C (77°F)	A ¹	1.00	0.98	0.97	0.96	0.96
	L ¹	1.00	0.93	0.87	0.81	0.76

¹ Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ luminaire testing

² In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on the durations that are within six times 40k (the IESNA LM-80-08 total test duration (in hours)) for the device under testing (DUT) i.e. the packaged LED chip

³ In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times (6x) the IESNA LM-80-08 total test duration (in hours) for the device under testing (DUT) i.e. the packaged LED chip

Crystal Lighting

DATE	
PROJECT	
TYPE	
NOTE	
PREPARED BY	

CLP-ACRN3



LED Post Top Acorn Light Fixture

- System Life Rating: >60,000 Hours, zero-maintenance
- Over 60% Energy Savings
- IP Rating: IP55, Suitable for Wet Location
- Light Output: 5000K, 75 CRI
- Voltage: Standard 120-277v
- Applications: Security Lighting, Walkways, Parks, Side Walk Lighting
- Warranty: 5 year warranty
- Construction: Die Cast Aluminum Housing, Prismatic Acrylic Lens
- Standard 3" Post Fitter

LIGHT BY
**PHILIPS
LUXEON**

Made In
the U.S.A.



Specifications:

Wattage	Photopic Lumens	Scotopic Lumens	CRI	CCT(KELVIN)	Rated Life
40W	5,550	9,075	75	5000K	>60,000 HRS

Driver Specifications

System Wattage	Input Voltage	Input Current	Frequency	Power Factor	Operating-Temp
40W	120/277V	0.33-0.14 A	50/60Hz	Over 98%	-30°F- 130°F

Ordering Guide

Example: (CLP-ACRN3-40CLED-50-120-277V-BZ-PC)

CLP-ACRN3						
MODEL	WATTS	COLOR TEMP	VOLTAGE	MOUNTING	FINISH	OPTIONS
CLP-ACRN3 POST LIGHT	40CLED-40W	50-5000K	120-277V	3" POST FITTER	BZ- BRONZE GRY-GRAY BLK-BLACK SIL-SILVER CUS-CUSTOM	PC-PHOTO CELL 4IN-4" POST FITTER



VL-CLP-CH29



FINISHES POWDER COAT : CUSTOM COLOR CONSULT FACTORY



PRODUCT DESCRIPTION:

LAMP RATING: up to 100,000 hours for enhanced safety and maintenance
LUMEN MAINTENANCE: 90% @ 20,000 hours
ENERGY SAVINGS: Over 57% compared to HPS and other HID sources
IP RATING: IP55, Suitable for wet locations
LIGHT OUTPUT: 5000K, >80 CRI
VOLTAGE: 120-277V standard, 480V optional
APPLICATIONS: Parking areas, walkways, roadways, highways
WARRANTY: 5 year warranty (see terms and conditions)
CONSTRUCTION: Heavy duty die cast aluminum body, borosilicate drop glass lens
 CONSULT FACTORY FOR SPECIAL REQUIREMENTS OR SPECIFICATIONS

EXAMPLE: VL-CLP-CH29-80IND-50-120/277V-BZ-PC

MODEL	WATTS	COLOR TEMP	VOLTAGE	MOUNTING	FINISH	OPTIONS
VL-CLP-CH29	40W-40IND 60W-60IND 80W-80IND 100W-100IND	27-2700K 35-3500K 41-4100K 47-4700K 50-5000K 60-6000K	120V-277V 480V	POLE MOUNT	BZ- BRONZE GRY-GRAY BLK-BLACK SIL-SILVER CUS-CUSTOM	PC-PHOTO CEL GS-GLARE SHIELD

LAMP SPECIFICATIONS

WATTAGE	LUMENS	CRI	SCOTOPIC	CCT	RATED LIFE
VL-CLP-CH29-40IND	3,280	>80	5,412	5000K	100,000 HRS
VL-CLP-CH29-60IND	5,150	>80	8,490	5000K	100,000 HRS
VL-CLP-CH29-80IND	6,560	>80	10,824	5000K	100,000 HRS
VL-CLP-CH29-100IND	8,200	>80	13,530	5000K	100,000 HRS

BALLAST SPECIFICATIONS

SYSTEM WATTAGE	INPUT VOLTAGE	INPUT CURRENT	INPUT FREQUENCY	POWER FACTOR	OPERATING TEMP	THD
45W	120-277VAC	0.36-0.17A	50/60Hz	.99	-40°F-160°F	<10%
65W	120-277VAC	0.54-0.23A	50/60Hz	.99	-40°F-160°F	<10%
85W	120-277VAC	0.70-0.30A	50/60Hz	.99	-40°F-160°F	<10%
105W	120-277VAC	0.88-0.38A	50/60Hz	.99	-40°F-160°F	<10%



VL-CLP-CH36



FINISHES POWDER COAT : CUSTOM COLOR CONSULT FACTORY



Bronze Grey Black

PRODUCT DESCRIPTION:

LAMP RATING: up to 100,000 hours for enhanced safety and maintenance

LUMEN MAINTENANCE: 90% @ 20,000 hours

ENERGY SAVINGS: Over 60% compared to HPS and other HID sources

IP RATING: IP55, Suitable for wet locations

LIGHT OUTPUT: 5000K, >80 CRI

VOLTAGE: 120-277V standard, 480V optional

APPLICATIONS: Exterior, parking areas, roadways, highways, parks

WARRANTY: 5 year warranty (see terms and conditions)

CONSTRUCTION: Heavy duty die cast housing, semi-cut off drop glass lens

CONSULT FACTORY FOR SPECIAL REQUIREMENTS OR SPECIFICATIONS

EXAMPLE: VL-CLP-CH36-120IND-47-120/277V-GRY-PC

MODEL	WATTS	COLOR TEMP	VOLTAGE	MOUNTING	FINISH	OPTIONS
VL-CLP-CH36	120W-120IND 150W-150IND 200W-200IND	27-2700K 35-3500K 41-4100K 47-4700K 50-5000K 60-6000K	120V-277V 480V	N/A	BZ- BRONZE GRY-GRAY BLK- BLACK CUS- CUSTOM	CDL-CLEAR DROP GLASS CFL-CLEAR FLAT GLASS PC- PHOTO CELL

LAMP SPECIFICATIONS

WATTAGE	LUMENS	CRI	SCOTOPIC	CCT	RATED LIFE
VL-CLP-CH36-120IND	9,600	>80	15,850	5000K	100,000 HRS
VL-CLP-CH36-150IND	12,000	>80	19,800	5000K	100,000 HRS
VL-CLP-CH36-200IND	17,000	>80	28,050	5000K	100,000 HRS

BALLAST SPECIFICATIONS

SYSTEM WATTAGE	INPUT VOLTAGE	INPUT CURRENT	INPUT FREQUENCY	POWER FACTOR	OPERATING TEMP	THD
125W	120-277VAC	1.05-0.45A	50/60Hz	.99	-40°F-160°F	<10%
155W	120-277VAC	1.30-0.56A	50/60Hz	.99	-40°F-160°F	<10%
210W	120-277VAC	1.75-0.76A	50/60Hz	.99	-40°F-160°F	<10%