



Request for Proposal (RFP)

Kaua'i Island Utility Cooperative's Streetlight Replacement Program

Issued 05/02/2014

REQUEST FOR PROPOSAL (RFP)

Project KIUC Streetlight Replacement Program with LED Lighting and Wireless Adaptive Control and Management System			Date RFP Issued 05/02/2014
Email Address Supplier to Submit Proposal kwilliam@kiuc.coop			Date Proposal Due 05/30/2014
Sole Point-of-Contact at KIUC Kathryn Williams	Phone Number 808.246.8292	Fax Number 808.246.8268	Anticipated Shortlist Selection 06/20/2014

Part A – KIUC General Information & Requirements

A1. Introduction

Kauai Island Utility Cooperative (KIUC) is seeking proposals from qualified Contractors to undertake the replacement of approximately 3,500 existing High Pressure Sodium (HPS) streetlights with LED streetlights in various areas of the Cooperative over a 6-month period, as well as the installation and implementation of a wireless adaptive control and management system. The successful Contractor will work with designated KIUC staff and will be responsible for the comprehensive oversight, implementation, management and control of the Project throughout the phases to achieve prescribed objectives as outlined in the Contract and defined in terms of time, quality and cost.

A2. General

The Island of Kauai is the fourth largest inhabited Hawaiian Island. It is roughly circular, approximately 555 square miles in size and 26 miles across at its widest points. Kauai’s de-facto population is 65,000 with the majority of its economy based on tourism and agriculture-related businesses. Currently, KIUC is the only franchised provider of electric service to consumers on the Island of Kauai. KIUC is a not-for-profit generation, transmission and distribution cooperative owned and controlled by the members it serves. Headquartered in Lihue, Kauai, Hawaii, the Cooperative currently serves more than 32,000 electric accounts throughout the island. KIUC’s peak load is 78 MWs, distributed over 13 substations by means of 2 major generating sites. KIUC offers different unmetered streetlight options through its Tariff to the County of Kauai (County), State of Hawaii (State) and private entities. While these streetlights are owned by the different entities, KIUC installs and maintains them. There are approximately 3,600 HPS streetlights on Kauai with the breakdown as follows:

	<u>Total</u>	<u>400W</u>	<u>250W</u>	<u>150W</u>	<u>100W</u>
• State of Hawaii -	582	0	512	17	53
• County of Kauai -	2,915	0	89	81	2,745
• KIUC Owned -	15	2	6	0	7
• Privately Owned -	126	0	5	15	91

Working in collaboration with the County and the State to meet their clean energy goals, KIUC has received requests from both parties to offer an LED streetlight option with a wireless adaptive control. Through these letters of commitment to conserving energy, KIUC intends to develop a tariff rate which includes a monthly fixture charge and a predetermined energy charge for the different LED lighting options. These charges will be determined utilizing the cost proposals of the selected Contractor along with KIUC’s anticipated expense to maintain and support initial replacement and any future installation request from the County or the State.

A3. Project Description

KIUC is seeking proposals from experienced LED streetlight and control system Contractors to undertake the replacement of 3,500 of the 3,600 HPS streetlights with LED lighting in various areas of the cooperative (KIUC and privately owned streetlights are excluded from the replacement count). This Project will also include the simultaneous implementation of a wireless adaptive control system which will allow KIUC, the County and the State to electronically manage the operation of the streetlight infrastructure on an individual real-time basis.

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The Contractor will be responsible for providing all of the personnel, materials and resources necessary for the comprehensive oversight, management, implementation and control of the Project throughout all phases to achieve prescribed objectives defined in terms of time, quality and cost. The following is intended to give an overview of the scope of the Project but is not intended to be an exhaustive listing of all work activities.

The work will also include the supply, installation and acquisition of UTM GPS location coordinates of LED units when implementing the wireless adaptive control system and the discarding of old HPS units in an environmentally safe and responsible manner.

A total of 3,500 units will be replaced and the Project will be implemented over a 6-month period. The proposal should outline how the Contractor will provide ongoing creative expertise and resources aimed at accomplishing the requirements.

The proposal should also address how the Contractor will develop, manage and foster a productive working relationship with KIUC's designated Project staff throughout the process.

The number and wattage of HPS fixtures to be replaced that are currently in use are as follows:

- 100W - 2,798
- 150W - 98
- 250W - 601
- 400W - 0

Cost proposals should be broken out by the following line items:

- Material cost per fixture by type (100W, 150W, 250W. Provide separate line item costs for fixtures by type and additional fixture options as indicated in the table below.
 1. Fixtures with standard non-dimming driver and standard 3-pin photocontrol receptacle as specified.
 2. Line item cost to add 0-10V dimming driver.
 3. Line item cost to add ANSI C136.41-2013 compliant 5-pin photocontrol receptacle.
 4. Line item cost for 5000K CCT LED light source in lieu of specified 4000K LED light source.
 5. Line item cost for Elevated 20kV/10kA electrical immunity option.
- Material cost for wireless adaptive control
- Labor cost to install fixtures
- Labor cost to install wireless adaptive control
- Project management cost along with administrative cost to collect GPS data

KIUC would also like a cost benefit comparison between LED streetlights with and without a wireless adaptive control. In addition, KIUC would like the option to provide the labor to install the physical assets.

KIUC intends to select a shortlist of Contractors for a pilot of the Streetlight Replacement Program and negotiate a final scope of work with the selected Contractor based on the results of the pilot installations. Proposals will be solicited from potential Lighting Contractors based on these technical specifications and documents.

KIUC will select a short list of no more than three Contractors from the initial proposals. Meetings or phone conferences will be scheduled between KIUC and the shortlisted Contractor's proposed technical project personnel to discuss the details of the Contractor's proposal, the details of the proposed pilot installations, and to clarify the intent of the specifications. Clarifications to the specifications may be required based on these meetings/phone conferences. Following the pilot installations, the shortlisted Contractors may be required to submit a revised proposal. From these revised proposals, KIUC will select a preferred Contractor and enter into negotiations for a final scope of work. The commitment of funds to the preferred Contractor will only occur once approval of the proposed LED Street Lighting Tariff has been received by KIUC from the Hawaii Public Utilities Commission.

The anticipated schedule for the Streetlight Replacement Program is as follows:

Specifications Issued for Bids	05/02/2014
Bids Due	05/30/2014
Shortlist Selection and Demonstration Pilot	06/20/2014
Selection of Contractor and Negotiation of Final Scope	09/19/2014

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In the evaluation of proposals, the objective of this RFP will be to select the offer(s) that will result in the best overall value for KIUC and which meet KIUC's specifications. Each compliant RFP submission will be evaluated by the KIUC's Project Team comprised of KIUC staff representatives from Energy Services, Engineering, Warehouse and Transmission & Distribution, as well as representatives from the State and County. KIUC reserves the right to solicit comments from Third Party organizations if deemed necessary.

By responding to this RFP, Contractors hereby agree to accept the recommendation of KIUC staff as to the selection of the successful RFP and acknowledge and agree that KIUC makes the final decision. The award will be subject to the approval of KIUC and commencement of the Project shall only begin after approval has been granted and Contract documents have been executed. All Contractors submitting a proposal will be notified following final approval of the successful Contractor by KIUC.

By submitting a Proposal, Contractors are (i) making a firm offer to deliver equipment and services as set forth and described herein pursuant to the terms and conditions of this RFP, (ii) agreeing that the proposal shall be valid for 180 calendar days unless Contractors explicitly states otherwise in the proposal, (iii) agreeing that KIUC may, in its sole discretion, accept or reject, in whole or in part, any proposal, (iv) agreeing that KIUC has sole discretion in selecting a Contractor for the materials and services and (v) agreeing that KIUC may, in its sole discretion, discontinue negotiations at any time prior to execution of an agreement which covers the materials and services.

Specifically in regards to this RFP, Contractors shall (i) bear all costs and expenses that it incurs, (ii) limit all communication to the "Sole Point-of-Contact" identified above and (iii) submit all questions to the Sole Point-of-Contact's email address identified above. Additionally, Contractors shall not (i) rely on any oral representation or oral modification made by the Sole Point-of-Contact or (ii) rely on any representation made by someone other than the Sole Point-of-Contact.

KIUC may reject any proposal not received by the "Date Proposal Due" identified above. KIUC will make a reasonable effort to respond to all questions within five business days of receipt. KIUC will share with other Contractors any question and subsequent response which KIUC determines, in its sole discretion, to be important to a Contractor's ability to appropriately respond to this RFP. However, questions regarding this proposal will only be accepted seven (7) calendar days prior to the stated RFP closing date to enable KIUC to prepare an addendum (if any). Questions received after this date may not be acknowledged nor answered.

KIUC will not be held liable for any errors or omissions in any part of this RFP. While KIUC has used considerable effort to ensure an accurate representation of information, the information contained in this RFP is supplied solely as a guideline for bidders. The information is not guaranteed or warranted to be accurate by KIUC, nor is it necessarily comprehensive or exhaustive. Nothing in this RFP is intended to relieve bidders from forming their own opinions and conclusions with respect to the matters addressed.

A4. Evaluation Criteria

#	CRITERIA	%
1	Overview and Contractor Proposal Submittal	10
2	LED Luminaire Technical Features and Performance Specifications Compliance	20
3	Lighting Adaptive Control & Monitoring System features	10
4	Price Proposal / Best Long Term Value Solution	40
5	Experience: Project Team & Designated Project Management Plan and References (DPM)	10
6	Quality Control Systems and Experience	10
	TOTAL CRITERIA PERCENTAGE	100

Please provide:

- A narrative demonstrating the Contractors understanding of the full scope of product and services being offered and other reporting requirements as outlined above.
- Detailed information on each LED product being proposed. Include with each a complete and thorough response to product specific requirements.
- Lighting Wireless Adaptive Control & Management System features with detailed information on the wireless adaptive control being proposed. Include with each a complete summary sheet which provides specification and response to product specific requirements and questions.

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- Price Proposal / Best Long Term Value Solution to provide the product and services described in this RFP for a period of fifteen years.
- Cost Proposal not including adaptive wireless control and cost benefit analysis with and without the use of wireless adaptive control.
- Experience of the Organizational Team including:
 - a. Description of Contractor’s firm and other partner firms and the type of services offered.
 - b. A description of at least two Projects involving LED streetlights and a wireless adaptive control system which the Contractor implemented; these cannot be ‘pilot’ Projects and must include:
 - Project Name
 - Client Name
 - Project Description
 - Client Reference name, title and phone number
- Project Team proposed including the experience and capability of the members.
- Quality Control: Indicate the methodologies the Project Manager will employ to obtain quality Evaluation Criteria, continued assurance and quality control in the delivery of services by any Project consultants, the Project Contractor and the Project Manager themselves.

A5. Design Conditions

As an islanded system in the South Pacific, the following design qualifiers need to be taken into consideration:

- Design Temperature Range: min 13C, max 37C
- Salt Air
- High Humidity
- Peak Wind Gust: 110 mph
- Seismic Zone: 1

A6. Additional Guidelines

- Luminaires need to be compliant with Act 287 past during the 2012 Hawaii Legislative Session
- Lighting levels will be in compliance with AASHTO
- Adaptive lighting controls will not interfere with KIUC’s existing L&G AMI RF mesh system

A7. Contractor Information/Signature

RFP SUBMISSION FOR:	STREETLIGHT REPLACEMENT PROGRAM
Contractor Company Name	
Address	
Zip Code	
Telephone Number	
Fax Number	
Email	
Name of Person Signing for Contractor	

We, the undersigned, declare we have carefully examined parts A and B of the RFP and Appendices.

Mail To: Kauai Island Utility Cooperative
4463 Pahee Street, Suite 1
Lihue, HI 96766-2000
808.246.4300

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The Contractor Declares:

- No person, firm or corporation other than the Contractor has any interest in this RFP submission or in the proposed services for this RFP;
- This RFP submission is made without any connection, comparison of figures, arrangements with or knowledge of any other corporation, firm or person submitting an RFP for the same Project and is in all respect fair and without collusion or fraud;
- The content and requirements of this RFP has been read and understood.

Dated at: _____ this _____ day of _____ 2014

Signature of Contractor as Named Above

Signature of Witness

Part B - Adopted from MSSLC Model Specifications:

PART B1 – LED Roadway Luminaire Specifications

The information in sections B1 and B2 below, along with the appendices, have been adopted from the MSSLC Model Specifications Version 1.0.

B1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by their basic designation only. Versions listed shall be superseded by updated versions as they become available.

- A. American National Standards Institute (ANSI)
 1. C136.2-2004 (or latest), American National Standard for Roadway and Area Lighting Equipment—Luminaire Voltage Classification
 2. C136.10-2010 (or latest), American National Standard for Roadway and Area Lighting Equipment - Locking-Type Photocontrol Devices and Mating Receptacle Physical and Electrical Interchangeability and Testing
 3. C136.15-2011 (or latest), American National Standard for Roadway and Area Lighting Equipment – Luminaire Field Identification
 4. C136.22-2004 (R2009 or latest), American National Standard for Roadway and Area Lighting Equipment – Internal Labeling of Luminaires
 5. C136.25-2009 (or latest), American National Standard for Roadway and Area Lighting Equipment – Ingress Protection (Resistance to Dust, Solid Objects and Moisture) for Luminaire Enclosures
 6. C136.31-2010 (or latest), American National Standard for Roadway Lighting Equipment – Luminaire Vibration
 7. C136.37-2011 (or latest), American National Standard for Roadway and Area Lighting Equipment - Solid State Light Sources Used in Roadway and Area Lighting
 8. C136.41-2013 (or latest), American National Standard for Roadway and Area Lighting Equipment—Dimming Control Between an External Locking Type Photocontrol and Ballast or Driver
- B. American Society for Testing and Materials International (ASTM)
 1. B117-09 (or latest), Standard Practice for Operating Salt Spray (Fog) Apparatus
 2. D1654-08 (or latest), Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
 3. D523-08 (or latest), Standard Test Method for Specular Gloss
 4. G154-06 (or latest), Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
- C. ENERGY STAR®
 1. ENERGY STAR TM-21 Calculator, rev. 020712 (or latest), http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/luminaires/TM-21Calculator.xlsx
- D. Federal Communications Commission (FCC)
 1. 47 CFR Part 15, Telecommunication – Radio Frequency Devices
- E. Federal Trade Commission (FTC)
 1. Complying with the Made in USA Standard, December 1998 (<http://business.ftc.gov/advertising-and-marketing/made-usa>)
 2. Green Guides, 16 CFR Part 260, Guides for the Use of Environmental Marketing Claims
- F. Illuminating Engineering Society of North America (IESNA or IES)
 1. LM-50-13 (or latest), IES Approved Method for Photometric Measurement of Roadway and Street Lighting Installations
 2. LM-61-06 (or latest), IESNA Approved Guide for Identifying Operating Factors Influencing Measured Vs. Predicted Performance for Installed Outdoor High Intensity Discharge (HID) Luminaires
 3. LM-63-02 (R2008 or latest), ANSI/IESNA Standard File Format for the Electronic Transfer of Photometric Data and Related Information
 4. LM-79-08 (or latest), IESNA Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products
 5. LM-80-08 (or latest), IESNA Approved Method for Measuring Lumen Maintenance of LED Light Sources
 6. RP-8-00 (or latest), ANSI / IESNA American National Standard Practice for Roadway Lighting
 7. RP-16-10 (or latest), ANSI/IES Nomenclature and Definitions for Illuminating Engineering
 8. TM-3-95 (or latest), A Discussion of Appendix E - "Classification of Luminaire Lighting Distribution," from ANSI/IESNA RP-8-83

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9. TM-15-11 (or latest), Luminaire Classification System for Outdoor Luminaires
10. TM-21-11 (or latest), Projecting Long Term Lumen Maintenance of LED Light Sources
- G. National Electrical Manufacturers Association (NEMA)
 1. LSD 63-2012, Measurement Methods and Performance Variation for Verification Testing of General Purpose Lamps and Systems
- H. National Fire Protection Association (NFPA)
 1. 70 – National Electrical Code (NEC)
- I. Underwriters Laboratories (UL)
 1. 1598 Third Edition (or latest), Luminaires
- J. LED Lighting Facts
 1. Partner Participation Manual, Version 4.0 (or latest)
 2. Family Groupings (<http://www.lightingfacts.com/About/Content/Manufacturers/FamilyPolicies>)
 3. Submission Requirements (<http://www.lightingfacts.com/About/Content/Manufacturers/SubmissionRequirements>)
- K. Municipal Solid-State Street Lighting Consortium (MSSLC)
 1. Model Specification for Networked Outdoor Lighting Control Systems, V2.0 (or latest)

B1.2. RELATED DOCUMENTS

- A. Contract Drawings and conditions of Contract (including General Conditions, Addendum to the General Conditions, Special Conditions, Division 01 Specifications Sections and all other Contract Documents) apply to the work of this section.
- B. MSSLC Model Specification for Adaptive Control and Remote Monitoring of LED Roadway Luminaires.

B1.3. DEFINITIONS

- A. Lighting terminology used herein is defined in IES RP-16. See referenced documents for additional definitions.
 1. Exception: The term “driver” is used herein to broadly cover both drivers and power supplies, where applicable.
 2. Clarification: The term “LED light source(s)” is used herein per IES LM-80 and TM-21 to broadly cover LED package(s), module(s), and array(s).

B1.4. REQUIRED SUBMITTALS FOR EACH LUMINAIRE TYPE DEFINED IN APPENDIX A

- A. Completed Appendix B Submittal Form
 1. Family grouping in accordance with LED Lighting Facts is permitted, provided this is clearly indicated on the submittal form provided in Appendix B, and clearly communicated via a letter that includes detailed calculations relating the tested product(s) to the submitted product.
- B. Product Cutsheets
 1. Luminaire Cutsheets
 2. Cutsheets for LED light source(s)
 3. Cutsheets for LED driver(s)
 4. If dimmable LED driver is specified, provide diagrams illustrating light output and input power as a function of control signal.
 5. Cutsheets for surge protection device, if applicable
- C. Instructions for installation and maintenance
- D. Summary of luminaire recycled content and recyclability
 1. Shall be in accordance with the FTC Green Guides, expressed by percentage of luminaire weight
- E. IES LM-79 luminaire photometric report(s)
 1. Shall be produced by the test laboratory
 - a. The test laboratory shall satisfy LED Lighting Facts accreditation requirements.
 2. Shall include the following information
 - a. Name of test laboratory
 - b. Report number
 - c. Date
 - d. Complete luminaire catalog number
 - e. Description of luminaire, LED light source(s), and LED driver(s)
 - f. Goniophotometry
 - i. IES TM-15 Backlight-Uplight-Glare (BUG) ratings shall be for initial (worst-case) values, i.e., Light Loss Factor (LLF) = 1.0.
 - ii. If luminaires are tilted upward for calculations in section 5.7, BUG ratings shall correspond to the same angle(s) of tilt.

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- F. Lumen maintenance calculations and supporting test data
 - 1. Shall be in accordance with LED Lighting Facts guidance.
- G. Summary of Joint Electron Devices Engineering Council (JEDEC) or Japan Electronics and Information Technology Industries (JEITA) reliability testing performed for LED packages
- H. Summary of reliability testing performed for LED driver(s)
- I. Written product warranty as per section 1.6 below
- J. Safety certification and file number indicating compliance with UL 1598
 - 1. Applicable testing bodies are determined by the US Occupational Safety Health Administration (OSHA) as Nationally Recognized Testing Laboratories (NRTL) and include: CSA (Canadian Standards Association), ETL (Edison Testing Laboratory), and UL (Underwriters Laboratory).
- K. Documentation supporting any U.S. origin claims for the product, in accordance with FTC guidance.

B1.5. REQUIRED SUBMITTALS FOR EACH STANDARD PHOTOCONTROL TYPE DEFINED IN APPENDIX A

- A. Product Cutsheets.
- B. Written full warranty for the photocontrol submitted.
- C. Completed Appendix C Submittal Form.

B1.6. QUALITY ASSURANCE

- A. Electrically test fully assembled luminaires before shipment from factory.
- B. Before approval and purchase, KIUC may request luminaire samples of product configurations listed in Appendix A for inspection. KIUC may request IES LM-79 testing of luminaire samples to verify performance is within manufacturer-reported tolerances.
 - 1. The successful respondents may be required to provide at no charge and FOB Destination / Freight Prepaid (1) sample each of the selected fixture type(s) from the manufacturer's standard product inventory within (21) days of notification by KIUC.
 - 2. Sample products are to be identical to those submitted for consideration during bidding and will be retained during the inspection period for evaluation by KIUC representatives. At the conclusion of the inspection period, the samples will be returned to the manufacturer FOB Origin / Freight Collect.

B1.7. WARRANTY

- A. All manufacturer supplied components of the luminaires shall have a minimum 5 year full warranty. If the warranty is not a full 5 year warranty on all luminaire components in the finished luminaire assembly, the luminaire will be determined to be non-compliant with the specifications.
- B. A full 10 year warranty must be available, and any additional cost for this warranty must be clearly listed with the submitted product quotation.
- C. Warranty shall be of the minimum duration specified, and shall cover maintained integrity and functionality of the following:
 - 1. Luminaire housing, wiring, and connections
 - 3. LED light source(s)
 - 4. Negligible light output from more than 10 percent of the LED packages constitutes luminaire failure.
 - 5. LED driver(s)
 - 6. External and internal housing and components finishes
- D. Warranty period shall begin 90 days after date of invoice, or as negotiated by owner such as in the case of an auditable asset management system.
- E. During the period of the warranty any replacement part(s) for a luminaire shall be provided promptly after receipt of notification that a luminaire has sustained a warranted failure. The defective part(s) shall be returned to the factory if requested by the manufacturer at the time of any such claim.

PART B2 – PRODUCTS

B2.1. LUMINAIRE REQUIREMENTS

- A. General Requirements
 - 1. Luminaires shall be as specified for each type in Appendix A.
 - 2. Transmissive optical components shall be applied in accordance with OEM design guidelines to ensure suitability for the environment (e.g., electromagnetic, thermal, mechanical, chemical).
 - 3. Luminaire shall be designed for ease of component replacement and end-of-life disassembly.
 - 4. LED light source(s) and driver(s) shall be RoHS compliant.

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5. Nominal luminaire input wattage shall account for nominal applied voltage and any reduction in driver efficiency due to sub-optimal driver loading.
 6. Luminaire shall accept the voltage or voltage range specified at 50/60 Hz, and shall operate normally for input voltage fluctuations of plus or minus 10 percent.
 7. All internal components shall be assembled and pre-wired using modular electrical connections.
 8. The following shall be in accordance with corresponding sections of ANSI C136.37:
 - a. Wiring and grounding
 - b. Terminal blocks for incoming AC lines
 - c. Photocontrol receptacle
 - d. Latching and hinging
 - e. Mounting provisions
 - f. Ingress protection
 9. Weight of the luminaire shall not exceed 35 lbs.
- B. Painted or Finished Luminaire Surfaces Exposed to the Environment
1. Shall exceed a rating of six per ASTM D1654 after 1000 hours of testing per ASTM B117.
 2. The coating shall exhibit no greater than 30% reduction of gloss per ASTM D523, after 500 hours of QUV testing at ASTM G154 Cycle 6.
- C. Thermal Management
1. Luminaires shall start and operate in -20°C to +40°C ambient.
 2. Maximum rated case temperature of driver and other internal components shall not be exceeded when operated in luminaire.
 3. Mechanical design of protruding external surfaces (heat sink fins) shall facilitate hose-down cleaning and discourage debris accumulation.
 4. Liquids or other moving parts shall be clearly indicated in submittals, shall be consistent with product testing, and shall be subject to review by Owner.
- D. Control Signal Interface
1. Luminaire designation(s) specified herein as “Required” shall accept a control signal as specified via separate controls specification referenced in section 1.2 above, e.g., for dimming.
 2. Luminaire designation(s) specified herein as “Not Required” need not accept a control signal.
- E. Electrical safety testing
1. Luminaire shall be listed for wet locations by a U.S. Occupational Safety Health Administration (OSHA) Nationally Recognized Testing Laboratory (NRTL).
 2. Luminaires shall have locality-appropriate governing mark and certification.
 3. Luminaire shall meet the performance requirements specified in ANSI C136.2 for dielectric withstand, using the DC test level and configuration.
- F. Electrical Immunity
1. Luminaire shall meet the performance requirements specified in ANSI C136.2 for electrical immunity, using the combination wave test – Enhanced 10kV / 5kA.
 2. Manufacturer shall indicate on Product Submittal Form whether failure of the electrical immunity system can possibly result in disconnect of power to luminaire.
- G. Interference
1. Luminaire shall comply with FCC 47 CFR part 15 interference criteria for Class B (residential) digital devices.
 2. Luminaire shall comply with section 5.2.5 (luminaires rated for outdoor use) of ANSI C82.77 at full input power and across specified voltage range.
- H. Color Attributes
1. Color Rendering Index (CRI) shall be no less than 60.
 2. Nominal Correlated Color Temperature (CCT) shall be as specified.
 - a. If submitted nominal CCT is listed in Table B.1 below, measured CCT and Duv shall be as listed in Table B.1.

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Table B1. Allowable CCT and Duv (adapted from NEMA C78.377)

Manufacturer-Rated Nominal CCT (K)	Allowable LM-79 Chromaticity Values	
	Measured CCT (K)	Measured Duv
2700	2580 to 2870	-0.006 to 0.006
3000	2870 to 3220	-0.006 to 0.006
3500	3220 to 3710	-0.005 to 0.007
4000	3710 to 4260	-0.005 to 0.007
4500	4260 to 4746	-0.004 to 0.008
5000	4746 to 5311	-0.004 to 0.008
5700	5312 to 6020	-0.003 to 0.009
6500	6022 to 7040	-0.003 to 0.009

3. If nominal CCT specified in Appendix A is not listed in Table 1, measured CCT and Duv shall be as per the criteria for Flexible CCT defined in NEMA C78.377.

I. Identification

1. Luminaire shall have an external label per ANSI C136.15.
2. Luminaire shall have an internal label per ANSI C136.22.

B2.2. STANDARD PHOTOCONTROL REQUIREMENTS

A. Operation and Performance Requirements

1. The unit shall operate from a -40°C to +70°C temperature range.
2. Photocontrols shall have a means of sealing according to ANSI C136.10, Sec. 4.3.
3. Each Photocontrol shall be provided with an internal surge suppression MOV and shall at minimum meet and exceed ANSI C136.10 at Category C. (20kv, 10KA) surge protection.

B. Electrical Requirements

1. The photocontrol shall be rated at nominal 120/277 VAC @ 60 Hz with power consumption less than or equal to 0.5 watts average.
2. The photocontrol's failure mode shall be fail on.
3. The unit shall be individually calibrated to turn-on at 1.5+- 0.3 foot-candles.
4. The maximum turn-off to turn on ratio shall not exceed 1.5:1
5. Complete Appendix C for each photocontrol proposed

C. Construction and Warranty Requirements

1. Assembled Photocontrols and each of their individual components shall be designed and constructed to have a nominal life of 20 years.
2. There shall be a 10 year minimum full non-prorated warranty offered on the Photocontrol, with preference given for longer warranties
3. The plug blades shall be solid brass
4. The housing shall be made of a long life material with UV inhibitor and antioxidant additives and ideally will come standard in a color other than black.
5. The housing shall indicate which direction the window should be oriented.
6. Circuit board components shall be protected on both sides from the environment with a conformal coating for moisture protection.

B2.3. MANUFACTURER SERVICES

- A. Manufacturer or local sales representative shall provide installation and troubleshooting support via telephone and/or email.

END OF SECTION

**APPENDIX A
MATERIAL SPECIFICATION**

TABLE 1: 100 Watt HPS Roadway Fixture Equivalent Type III Distribution	
Recommended Equivalent Product:	Voltage range, Watts
American Electric Lighting - ATB0-20BLEDE70-MVOLT-R3-NL	(120-277V) 47 Watts
Cooper Lighting - XNV-AC-01-E-U-3-10K-FADC-4-U-AP	(120-277V) 39 Watts
Cree Lighting - BXSP-A-0-3-G-A-U-S-R-U	(120-277V) 53 Watts
GE Lighting - ESR1-0-BX/EX-5-40-2-GRAY-L-T	(120-277V) 54 Watts
Leotek - EC1-6M-MV-NW-3-GY-700/530-DSC-WL	(120-277V) 42 Watts
Philips - RVS-35W32LED4K-LE3-UNIV-RC-GY3-API	(120-277V) 37 Watts
Philips Hadco - RX132-I-3-N-A-5-R-N-A-N	(120-277V) 54 Watts

*** If your product is not listed, please submit information of your proposed product ***

TABLE 2: 150 Watt HPS Roadway Fixture Equivalent Type III Distribution	
Recommended Equivalent Product:	Voltage range, Watts
American Electric Lighting - ATB0-30BLEDE10-MVOLT-R3-NL	(120-277V) 108 Watts
Cooper Lighting - XNV2-AC-02-E-U-3-10K-FADC-4-U-AP	(120-277V) 76 Watts
Cree Lighting - BXSP-A-0-3-H-A-U-S-R-U	(120-277V) 101 Watts
GE Lighting - ESR2-0-GX/EX-5-40-2-GRAY-L-T	(120-277V) 118 Watts
Leotek - EC3-10M-MV-NW-3-GY-700/700-DSC-WL	(120-277V) 87 Watts
Philips - RVS-108W48LED4K-LE3-UNIV-RC-GY3-API	(120-277V) 105 Watts
Philips Hadco - RX164-I-3-N-A-5-R-N-A-N	(120-277V) 101 Watts

*** If your product is not listed, please submit information of your proposed product ***

TABLE 3: 250 Watt HPS Roadway Fixture Equivalent Type III Distribution	
Recommended Equivalent Product:	Voltage range, Watts
American Electric Lighting - ATB2-40BLEDE10-MVOLT-R3-NL	(120-277V) 146 Watts
Cooper Lighting - NVN-AE-02-E-U-T3R-10K-4-U-AP	(120-277V) 107 Watts
Cree Lighting – STR-LWY-3ME-HT-1-F-UL-SV-A-40K-R-SC-UTL	(120-277V) 136 Watts
GE Lighting – ESR3-0-KX/EX-5-40-2-GRAY-L-T	(120-277V) 159 Watts
Leotek - EC7-18M-MV-NW-3-GY-700/530-DSC-WL	(120-277V) 126 Watts
Philips - RVM-145W128LED4K-LE3-UNIV-RC-GY3-API	(120-277V) 137 Watts
Philips Hadco – RX296-I-3-N-A-5-R-N-A-N	(120-277V) 158 Watts

*** If your product is not listed, please submit information of your proposed product ***

TABLE 4: PHOTOCENTROLS	
Recommended Equivalent Product:	Voltage range, VA
DTL - DLL127-1.5	(120-277V) 1800VA
FP / Sun-Tech - ELL124	(105-305V) 1800VA
Ripley - 6390LL-BK	(105-305V) 1800VA

*** If your product is not listed, please submit information of your proposed product ***

APPENDIX B
LUMINAIRE PRODUCT SUBMITTAL FORM

Luminaire manufacturer			
Luminaire model number			
Nominal BUG ratings	B =	U =	G =
Product family testing	<input checked="" type="checkbox"/> Submitted product is identical to tested product		<input type="checkbox"/> Submitted product differs from tested product(s) as explained in attached letter
Housing finish color			
Tenon nominal pipe size	Inches		
Nominal luminaire weight	Lb		
Nominal luminaire EPA	ft ²		
Nominal luminaire input voltage	V		
Dimmability	<input type="checkbox"/> Dimmable		<input type="checkbox"/> Not dimmable
Control signal protocol			
Electrical immunity Combination wave test level	<input type="checkbox"/> Basic 6kV / 3kA	<input checked="" type="checkbox"/> Enhanced 10kV / 5kA	<input type="checkbox"/> Elevated 20kV / 10kA
Upon failure of electrical immunity system	<input type="checkbox"/> Possible disconnect		<input type="checkbox"/> No possible disconnect
ANSI vibration test level	<input type="checkbox"/> Level 1 (Normal)		<input type="checkbox"/> Level 2 (bridge/overpass)
Thermal management	<input type="checkbox"/> Liquids or moving parts		<input type="checkbox"/> No liquids or moving parts
Luminaire warranty period	Years		
Rated life of LED driver(s)	Hours		
LM-80 test duration	Hours		
LED lumen maintenance *	<input type="checkbox"/> Reported (restricted)		<input type="checkbox"/> Calculated (unrestricted)
Make/model of LED light source(s)			
Make/model of LED driver(s)			
	Nominal value	Tolerance (%)	
Luminaire input power—initial	W	W	
Luminaire input power—maintained **	W	W	
LED drive current—initial	mA	mA	
LED drive current—maintained **	mA	mA	
In-situ LED T _s	°C	°C	
LED lumen maintenance **			
CCT	K	K	
Additional product description			

* Manufacturer shall indicate which is applicable (check only one box) as per. According to IES TM-21, "Reported" lumen maintenance projections are restricted to 5.5x or 6x the duration of LM-80 testing, whereas "Calculated" values are unrestricted.

** As per section B1.4.

APPENDIX C
STANDARD PHOTOCONTROL PRODUCT SUBMITTAL FORM

Photocontrol Manufacturer			
Manufacturer and Model number			
Operating life (yrs)		Warranty (yrs)	
Power Consumption Avg Watts		Rated voltage (V)	
Turn-off to turn-on ratio		Turn-on (ft-c)	
Failure Mode	<input type="checkbox"/> Fail-on	<input type="checkbox"/> Fail-off	Rated Load Watts
		Color	
Internal Surge Suppression level			