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DATE: February 16, 2017

TO: Commissioners and Interested Parties

FROM: Steve Hudson, Deputy Director
Barbara Carey, District Manager
Denise Venegas, Coastal Program Analyst

SUBJECT: University of California Santa Barbara Minor LRDP Amendment No. LRDP-4-UCS-16-0004-3 for Commission Action at its March 9, 2017 hearing in Ventura.

AMENDMENT DESCRIPTION

The University of California at Santa Barbara is requesting that the Commission certify an amendment to its Long Range Development Plan (LRDP). The LRDP amendment incorporates an Outdoor Lighting Replacement and Retrofit Program (OLRRP) into the LRDP appendix. The OLRRP contains detailed requirements for the installation, replacement, retrofit, and performance standards pertaining to night lighting, and restricts outdoor sports lighting to Recreation-designated locations of the existing Main Campus sports and recreation complex, Harder Stadium, and two existing lighted tennis courts south of Harder Stadium.

The proposed LRDP amendment includes: (1) addition to appendix 4 of the LRDP to incorporate an Outdoor Lighting Replacement Program, (2) replacement Appendix 4 Map "Main Campus Recreation Outdoor Lighting" from the existing LRDP Appendix 4 with Figure 2 "Map of Athletics and Recreational Sport Facility Lighting" contained in the proposed OLRRP and (3) revision of Land Use Policy LU-29 and Environmental Sensitive Habitat Area Policy ESH-15 to update the policy language to refer to the new proposed Figure 2 rather than the existing Appendix 4 Map titled "Main Campus Recreation Outdoor Lighting".

MINOR LRDP AMENDMENT DETERMINATION

Pursuant to Section 30514(c) of the Coastal Act and Section 13554(a) of the Commission's regulations, the Executive Director has determined the proposed amendment is "minor" in nature. Sections 13554 and 13554(d) of the Regulations provide that a minor amendment includes, but is not limited to, changes which: 1) do not change the kind, location, intensity or density of use; 2) do not modify resource protection measures; and/or 3) impose further conditions, restriction or limitations on any use which might adversely affect coastal resources, provided such restrictions do not conflict with any policy of Chapter 3 of the Coastal Act or with any other certified LRDP policy. Section 13554(c) of the Regulations also provides that a minor amendment may include changes in the notification and hearing procedures that are consistent with the requirements of the Coastal Act.

The University's proposed amendment (attached) expressly implements the provision of Environmentally Sensitive Habitat Area Policy ESH-15 which states that the University shall replace and/or retrofit all outdoor lighting to minimize the campus lighting footprint/envelope to avoid, or minimize to the maximum extent feasible, all forms of light pollution, including glare, sky glow, and light trespass into sensitive habitats and open space. Specifically, ESH-15 requires the University to prepare and submit an Outdoor Lighting Replacement and Retrofit Program which shall include: 1) a baseline assessment of the type and location of all existing outdoor lighting; 2) a replacement/retrofit map that identifies the location of all non-compliant outdoor lights and describes whether each light shall be replaced or retrofitted; 3) a suite of target technologies and lighting specifications; 4) a strategy to prioritize the replacement and/or retrofit of the identified lights with the

highest priority; 5) a proposed schedule to implement the replacement/retrofit and 6) an approach to replacement/retrofit that is also implemented as part of each campus development that includes an outdoor lighting component. Consistent with LRDP Policy ESH-15, the University proposes to incorporate an Outdoor Lighting Replacement Program, which contains the above mentioned components, into the LRDP appendix. Furthermore, the University proposes to replace Appendix 4 Map "Main Campus Recreation Outdoor Lighting" with a new proposed Figure 2 "Map of Athletics and Recreational Sport Facility Lighting" which is a part of the proposed program. The new figure identifies the location of outdoor sports lighting fixtures and provides addition detail, however the figure does not modify the sports lighting footprint that is currently certified as part of the LRDP. Lastly, the amendment includes a revision to Land Use Policy LU-29 and Environmental Sensitive Habitat Area Policy ESH-15 to revise the policy text to refer to the new proposed Figure 2 rather than the existing Appendix 4 Map titled "Main Campus Recreation Outdoor Lighting".

The proposed OLRRP does not change any parameters that are already in place regarding lighting. The OLRRP provides a greater level of detail such as lighting fixture specifications to ensure that fixtures meet the requirements of LRDP Policy ESH-15. The certified LRDP contains policies and provisions already in place to protect coastal resources from lighting impacts and the OLRRP will implement these protective requirements more specifically, and can be applied on a project level basis. Therefore, since the OLRRP provides a greater level of detail and meets existing parameters, the OLRRP also protects coastal resources consistent with Chapter 3 of the Coastal Act. Lastly, the subject amendment represents revisions to the LRDP, for the purpose of minimizing the campus' lighting footprint through the implementation of LRDP Policy ESH-15, which do not change the kind, location, intensity or density of use allowed. Therefore, the proposed amendment is consistent with the certified Long Range Development Plan and the Coastal Act, and is considered "minor" as defined under Section 13554.

PROCEDURES

Pursuant to Section 13551(b) of Title 14 of the California Code of Regulations, a governing authority's submittal of a proposed LRDP amendment must indicate whether the long range development plan amendment will require formal governing authority's adoption after Commission approval, or is an amendment that will take effect automatically upon the Commission's approval pursuant to Public Resources Code Sections 30512, 30513 and 30519. In this case, the University has submitted the amendment as one that will take effect automatically upon approval by the Commission. If one third of the appointed members of the Commission requests, the determination of minor amendment shall not become effective and the amendment shall be processed in accordance with 14 CCR Section 13555(b).

PUBLIC NOTICE

Section 13555 of Title 14 of the California Code of Regulations requires the Executive Director to prepare a report describing the proposed amendment and providing notice of the Executive Director's determination the amendment is of a "minor" nature. Section 13555 also requires the Executive Director to report to the Commission at the next meeting, his or her determination and objections to the determination, if any, that have been received within 10 working days. If one third of the appointed members of the Commission requests, the determination of minor amendment shall not become effective and the amendment shall be processed in accordance with Section 13555(b).Notification of the proposed amendment will be mailed on February 17, 2017. The ten working-day objection period will therefore terminate on March 6, 2017. The Commission will be notified at the March 9, 2017 meeting of any objections.

Also, Section 30503 of the Coastal Act requires that maximum opportunities for public input be provided in preparation, approval, certification and amendment of any LRDP. The University held public hearings on the proposed changes. The hearings were noticed to the public consistent with Section 13515 of Title 14 of the California Code of Regulations and the University provided evidence of the measures taken to provide notice of their hearings, consistent with Section 13552 of Title 14 of the California Code of Regulations. Notice of the subject amendment has been distributed to all known interested parties.

shall be installed to ensure that vehicles are unable to access this road. Such measures may be designed to allow necessary emergency vehicle access. The University shall mitigate the impacts of the road improvements at a ratio of 4:1 specifically including: a bridge (or similar design allowed above) to restore natural connections between the wetland areas, restoration of wetland and/or wetland buffers north of the road, and installation of interpretive signage highlighting the importance of the surrounding open space, wetland, and nearby raptor habitat. The NOID may also include an alternative event access road consistent with Figure E.1.

Concurrent with the phasing out of vehicles on the road connecting Parking Lot 38 to Los Carneros Road as described above, the remaining dirt road immediately north of Parking Lot 38 shall also be limited to bicycle and pedestrian access, thereby restricting vehicular use of that portion of the road. Vehicular access to the gardens and greenhouses shall be through Parking Lot 38 with vehicles exiting via the road apron in the northwestern portion of the parking lot. This access would necessarily require crossing the bicycle path to access the garden facilities.

Policy LU-29 – Development at the **Storke Field Recreation** site shall be located within the approximately 19-acre potential development envelope designated as Recreation on Figure D.3 and shall be consistent with the following build-out provisions:

a. Recreation facilities serving organized sports and recreational programs are allowed in the Storke Field Recreation Area.

b. Outdoor sports lighting shall be prohibited on Storke Field and allowed at the tennis courts within the boundaries of the "Limits of Outdoor Sports Lighting ~~Map~~" ~~i~~on Figure 2 of Appendix 4 pursuant to Policy ESH-15.

c. Indoor or enclosed facilities shall be clustered with the existing developed housing area and along the eastern edge of Storke Campus. Outdoor lighting for these facilities shall be the minimum necessary for safety purposes and consistent with lighting standards in Policy ESH-15.

d. Development, including recreation facilities and parking, shall not extend any further north or west of the existing Parking Lot 38 footprint. The dirt road and bicycle path north of Parking Lot 38 may be retained within its current developed footprint for the purpose of providing bicycle and pedestrian access. Vehicular use shall be prohibited.

e. Parking to serve recreational uses shall be available on the site in Parking Lot 38. However, recreational parking may be dispersed during peak events where allowed pursuant to Policy TRANS-19.

f. Development on this site primarily consists of surface fields and parking. The surface parking Lot 38 may be developed with a covered structure with rooftop solar provided that the structure is sited, designed, and sized to ensure that there will be no fuel modification/fire reduction activities, tree trimming or tree removal, or light spillover in the adjacent ESHA or Open Space. Lot 38 lighting shall be retrofitted concurrently with the installation of the cover, or sooner as consistent with Policy ESH-15. Recreation development on the east portion of the site shall not exceed 45 feet in height along Stadium Road and the covered parking with solar shall not exceed 20 feet in height as shown in Map D.4.

West Campus

Policy LU-30 – The **Devereux South Knoll** site shall not be redeveloped until and unless a targeted LRDP Amendment is certified by the Coastal Commission which assigns parameters for redevelopment and build-out. Redevelopment of the site shall not include residential uses. Future plans for

1. Include the Baseline Assessment developed pursuant to Subparagraph A above;

2. Provide a replacement/retrofit map that identifies the location of all non-compliant outdoor lights and describes whether each light shall be replaced or retrofitted;

3. Identify a suite of target technologies and lighting specifications to meet the requirements of Subparagraph C. below.

4. Prioritize the replacement and/or retrofit of the identified lights with the highest priority assigned to the non-compliant outdoor sports and recreation facility lighting and the second highest priority assigned to non-compliant outdoor lights of any kind in closest in proximity to ESHA, wetlands, or open space; when replacement/retrofit is implemented in conjunction with a NOID for a new development, the highest priority may, alternately, be assigned to the nearest non-compliant lighting proximate to the proposed development;

5. Identify a proposed schedule to incrementally implement the replacement/retrofit in the order prioritized as part of each campus construction project to ensure full replacement/retrofit within ten years of the certification of the 2010 LRDP; this shall include measurable goals to be implemented with each NOID; and

6. Be implemented as part of each campus development that includes an outdoor lighting component; additionally, the Program may be implemented through a series of separate projects as necessary to achieve full Program implementation in the given time-frame.

B. All outdoor lighting shall be designed to avoid, or minimize to the maximum extent feasible, all forms of light pollution, including light trespass, glare, and sky glow, and shall at a minimum incorporate the following:

1. Best available visor technology to minimize light spill and direct/focalize lighting downward, toward the targeted area(s) only;

2. The minimum standard (pole) height and height of the light mounting necessary to achieve the identified lighting design objective;

3. The best available technology and a lighting spectrum designed to minimize lighting impacts on sensitive species and habitat; and

4. Measures to minimize light trespass onto ESHA and open space areas.

C. As part of the routine maintenance and replacement of outdoor light fixtures and bulbs, including repair and maintenance of fixtures attached to buildings, the University shall use new materials that meet or exceed the standards set forth in Subparagraph C.

D. New or retrofitted lighting of outdoor sports facilities shall be limited to the Recreation-designated lands at Harder Stadium, the two approved tennis courts on Storke Campus, and within the Main Campus recreational complex as it exists as of the date of certification of the 2010 LRDP within the area delineated ~~on~~*by* the "Limits of Outdoor Sports Lighting ~~Map~~" ~~i~~*on* *Figure 2 of* Appendix 4. New outdoor lighting for sports purposes outside of the limits shown on ~~the "Limits of Outdoor Sports Lighting Map"~~ *Figure 2 of Appendix 4* shall be prohibited. Existing night lighting of sports facilities elsewhere on campus shall be considered a non-conforming use/structure. New or retrofitted sports lighting shall require a Commission-approved Notice of Impending Development, which shall not be processed until the Commission certifies

University of California Santa Barbara

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I. INTRODUCTION

The University of California Santa Barbara (UCSB) is committed to reducing nighttime outdoor lighting pollution, otherwise known as skyglow. The Baseline Assessment and Outdoor Lighting Plan will demonstrate how all “non-compliant” outdoor lights with unshielded luminaires and lighting adjacent to ESHA or open space will be replaced with “dark sky” technology lighting, and additional shielding as appropriate, within 10 years of the California Coastal Commission’s (CCC) December 2014 certification of the UCSB Long Range Development Plan (LRDP). Dark sky technology lighting minimizes skyglow, glare, and light spillage into sensitive areas. The Baseline Assessment will provide a strategy for budgeting and implementation of an Outdoor Lighting Replacement and Retrofit Program. The Baseline Assessment will be followed by annual reports that track the incremental progress of the Program. The plan will be fully implemented over an eight year period and be completed by the year 2024.

This Outdoor Lighting Plan represents a program to implement modern outdoor lighting standards and “dark sky” technologies consistent with Policy ESH-15 of the Long Range Development Plan (LRDP) to avoid, or minimize to the maximum extent feasible, all forms of light pollution, including glare, sky glow, and light trespass into sensitive habitats and open space. All stand-alone luminaires shall be processed pursuant to a Notice of Impending Development (NOID), either as a phased implementation of the outdoor lighting replacement or as integrated into individual project NOIDs. The requirement for a NOID does not apply when existing fixtures are replaced and upgraded as part of routine maintenance and the pole is not removed, replaced, or relocated. Compliance with the provisions of Policy ESH-15 shall be confirmed as part of the NOID process. Where best available technologies or measures are improved beyond those proposed in this Outdoor Lighting Plan, the improved standards and technologies may be required to the fulfill the provisions of Policy ESH-15 as approved by the Commission through the NOID.

This document is intended to be used in conjunction with the provisions of LRDP Policy ESH-15. This document contains many terms that may be unfamiliar to the user. Therefore, definitions are provided in Section VI.

II. BACKGROUND/SETTING

UCSB is composed four campuses which encompass a total of approximately 1,160 acres (see Location Map in Figure 1). The Baseline Outdoor Lighting Assessment Inventory Map is included in Attachment 1. There are approximately 1,724 outdoor lighting fixtures on the combined Main, Storke, West, and North campuses. As of April 2016, approximately 895 of these lighting fixtures are currently in compliance with dark sky technology; and approximately 829 are not in compliance. The responsibility of installing and maintaining the outdoor lighting fixtures is divided up among several general campus groups. The groups include Athletics, Recreational Sports, Housing and Residential Services, Transportation and Parking Services, and General Campus Administration (see map in Attachment 1).

Figure 1 UCSB Campuses.

III. LRDP POLICY

The LRDP contains policies that broadly protect significant habitat and resources on campus. Among the Environmentally Sensitive Habitat Areas (ESHA) policies, lighting limits are set by Policy ESH-15 below:

Policy ESH-15 *– The University shall replace and/or retrofit all outdoor lighting within ten (10) years following the date of effective certification of the 2010 LRDP to minimize the campus lighting footprint/envelope consistent with the following:*

> ***A.*** *The University shall prepare a campus-wide Baseline Outdoor Lighting Assessment that:*
>
> > ***1.*** *Provides an inventory, map, and detailed description of existing outdoor lighting;*
> >
> > ***2.*** *Identifies stand-alone (pole-mounted, bollards, etc.) light fixtures that do not comply with the design and efficiency standards set forth in Subparagraph C below; and*
> >
> > ***3.*** *Describes the lighting specifications used to measure compliance with the design and efficiency standards set forth in Subparagraph C below.*
>
> ***B.*** *The University shall prepare and submit an Outdoor Lighting Replacement and Retrofit Program as an LRDP Amendment for Commission approval within 18 months after the updated LRDP is certified. The Program shall:*
>
> > ***1.*** *Include the Baseline Assessment developed pursuant to Subparagraph A above;*

2. *Provide a replacement/retrofit map that identifies the location of all non-compliant outdoor lights and describes whether each light shall be replaced or retrofitted;*

3. *Identify a suite of target technologies and lighting specifications to meet the requirements of Subparagraph C. below.*

4. *Prioritize the replacement and/or retrofit of the identified lights with the highest priority assigned to the non-compliant outdoor sports and recreation facility lighting and the second highest priority assigned to non-compliant outdoor lights of any kind in closest in proximity to ESHA, wetlands, or open space; when replacement/retrofit is implemented in conjunction with a NOID for a new development, the highest priority may, alternately, be assigned to the nearest non-compliant lighting proximate to the proposed development;*

5. *Identify a proposed schedule to incrementally implement the replacement/retrofit in the order prioritized as part of each campus construction project to ensure full replacement/retrofit within ten years of the certification of the 2010 LRDP; this shall include measurable goals to be implemented with each NOID; and*

6. *Be implemented as part of each campus development that includes an outdoor lighting component; additionally, the Program may be implemented through a series of separate projects as necessary to achieve full Program implementation in the given time-frame.*

C. *All outdoor lighting shall be designed to avoid, or minimize to the maximum extent feasible, all forms of light pollution, including light trespass, glare, and sky glow, and shall at a minimum incorporate the following:*

1. *Best available visor technology to minimize light spill and direct/focalize lighting downward, toward the targeted area(s) only;*

2. *The minimum standard (pole) height and height of the light mounting necessary to achieve the identified lighting design objective;*

3. *The best available technology and a lighting spectrum designed to minimize lighting impacts on sensitive species and habitat; and*

4. *Measures to minimize light trespass onto ESHA and open space areas.*

D. *As part of the routine maintenance and replacement of outdoor light fixtures and bulbs, including repair and maintenance of fixtures attached to buildings, the University shall use new materials that meet or exceed the standards set forth in Subparagraph C.*

E. *New or retrofitted lighting of outdoor sports facilities shall be limited to the Recreation-designated lands at Harder Stadium, the two approved tennis courts on Storke Campus, and within the Main Campus recreational complex as it exists as of the date of certification of the 2010 LRDP within the area delineated on the "Limits of Outdoor Sports Lighting Map" in Appendix 4. New outdoor lighting for sports purposes outside of the limits shown on the "Limits of Outdoor Sports Lighting Map" shall be prohibited. Existing night lighting*

of sports facilities elsewhere on campus shall be considered a non-conforming use/structure. New or retrofitted sports lighting shall require a Commission-approved Notice of Impending Development, which shall not be processed until the Commission certifies the Outdoor Lighting Replacement and Retrofit Program required pursuant to Subparagraph B above, and shall meet the standards set forth in Subparagraph C above and the following additional requirements:

***1.** Shall not exceed the minimum level of power and brightness necessary for the proposed level of collegiate or intramural use; and*

***2.** Shall mitigate the impact of new lighting by retrofitting or removing existing sports lighting and other outdoor lighting sources consistent with the identified priorities in Subparagraph B above.*

***F.** Development with an outdoor lighting component shall comply with the standards set forth in Subparagraph C of this policy. In addition, the NOID for each development with an outdoor lighting component shall implement a portion of the Outdoor Lighting Replacement and Retrofit Program consistent with the provisions of Subparagraph B above. Prior to the approval of the Outdoor Lighting Replacement and Retrofit Program, each NOID with an outdoor lighting component shall include outdoor lighting retro fits/replacements in the nearest feasible location(s) to the proposed development. The NOID shall include a lighting plan and lighting specifications that identify the location of lights, the light fixture type, the light spectrum/bulb, the direction of light, and any special measures or treatments to control light spill for all on-site and off-site replaced/retrofitted outdoor lighting. The replacement schedule/map shall be updated and submitted in support of each NOID to track the progress of the Program implementation.*

***G.** The University shall submit to the Executive Director of the Commission an annual report tracking the incremental progress of the Outdoor Lighting Replacement and Retrofit Program. The report shall indicate the location, type, and specifications for outdoor lighting replacements and retrofits that occurred in the previous year and priority areas for the subsequent year.*

IV. EXISTING BASELINE INVENTORY - MAY 2016

The existing outdoor lighting inventory generally consists of five types of fixtures mounted on poles between 10 and 27 feet above ground level, and sports facility lighting mounted on poles between 20 and 120 feet above ground level. Approximately 895 existing fixtures are “full cutoff” and some of these are fully shielded; and all of the 895 are considered compliant with dark sky technology standards (International Dark-Sky Association 2016). These fixtures do not emit light above the lowest light emitting part of the fixture (see Definition of Acceptable Fixtures and diagrams in Attachment 2). Most existing fixtures are controlled with shut off sensors, timers, motion detectors, etc. (i.e. lights are turned off when not needed). Campus contains several types of unshielded fixtures with exposed light sources (P2S Engineering, Inc, 2011). The exposed light sources produce glare and light trespass, and the light is not directed toward the defined area/target for which illumination is planned (e.g. parking lot, doorway, walkway, signage, etc). In addition, the proliferation of Light-Emitting Diode (LED) technology has rendered many of these light

fixtures to be inefficient and outdated. The most common non-compliant fixture is a glass globe/sphere. There are approximately 465 of these fixtures on campus (see Photos L1 and L2 in Attachment 3). There are approximately 364 other non-compliant fixtures of various designs located across all four campuses (see diagrams of unacceptable examples in Attachment 2 and Photos L42-45, and L145-8 in Attachment 3). Table 1 lists a summary of the inventory of the existing non-compliant lighting. All outdoor light fixtures on North Campus are compliant with dark sky technology standards.

Table 1. Inventory of Existing Non-Compliant Lighting, August 2016

Campus	Globe fixture	Other fixture	Total
Main	415	245	660
Storke	38	80	118
West	12	39	51
Total	**465**	**364**	**829**

The Replacement/Retrofit map in Attachment 1 illustrates the location of all non-compliant outdoor lights. All globe/sphere fixtures will be replaced, rather than retrofitted. Other types of fixtures may either be retrofitted with shields or replaced – depending on whether the estimated useful lifetime of the pole and fixture is less than 10 years. For internal planning purposes unrelated to implementation of the Phased Replacement/Retrofit, the maps also indicate which campus group has responsibility for maintaining and replacing the non-compliant fixtures. A suite of technologies and lighting specifications has been identified to incorporate best available visor/shield technology, minimum standard pole and fixture height, a low-impact lighting spectrum, and guidelines that minimize light trespass onto ESHA and open space areas (more detail is provided in the following section). Campus Administration will work with the other campus groups to ensure that all replacements and retrofits adhere to the proposed suite of technologies and specifications, or to improved standards and technologies where best available technologies or measures are improved beyond those proposed in this Outdoor Lighting Plan, as may be required to the fulfill the provisions of Policy ESH-15.

V. PROPOSED SCHEDULE AND FIXTURE SPECIFICATIONS

A. Athletics and Recreational Sports Facilities Lighting Schedule

The highest priority replacement and/or retrofit of non-compliant fixtures is assigned to outdoor sports and recreation facilities. These existing fixtures typically illuminate larger areas – such as outdoor basketball courts and soccer fields. The fixtures are typically located at heights of 25 feet and greater. These attributes contribute to higher night-time lighting pollution levels. Therefore, replacement and/or retrofit of these fixtures with Dark Sky technologies will be beneficial to UCSB's efforts in balancing a light spill reduction with the provision of guaranteed

light levels that meet playing standards for depth and color perception on the courts and fields.

The map in Figure 2 illustrates the non-compliant fixtures within outdoor sports and recreation facility areas. New or retrofitted lighting of outdoor sports and recreation facilities will be limited to the area delineated on LRDP Appendix 4 Limits of Outdoor Sports Lighting Map (limit also shown on Figure 2). The Program would include best practices, such as curfews (generally shut off or reduced lighting levels at 11pm) for outdoor sports and recreation event lighting, field-rotatable optics for focusing on the intended target and playing area, and cutoff shielding to reduce light spill. The addition of cutoff shielding will compromise the coverage of the intended target field areas. Therefore, the remedy will be to raise the fixtures to heights where the light beams will fully cover the intended target field areas without compromising efforts to reduce light spill.

The outdoor sports and recreation facilities are maintained by two separate campus groups.

1. Recreational Sports

   a) The floodlights at Rob Fields 1-3 (shown on Figure 2 and Photo in Attachment 4) are maintained by the Recreational Sports group. The existing fixtures have no shielding and replacement would help bring Campus into compliance with Dark Sky technology. These nine high-mast fixture clusters have color temperatures of 5,000-6,000 K, and they would be replaced with 5,700 K full-cutoff LED fixtures and/or luminaires with additional direction/shielding within the years 2017-2019. The replacement of the existing poles (50’ above ground) would be necessary because additional direction/shielding would narrow the light beams and reduce the coverage (target) area of the sports field to a level that is unacceptable for playing standards. A taller replacement fixture height would both comply with dark sky technologies and cover the intended target. The proposed height would be the same as the existing cutoff 70 foot tall fixtures at Rob Field 4 (see Rob Field 4 Photo in Attachment 4).

   b) The 13 floodlight fixtures at Rob Gym Outdoor Courts (shown on Map in Figure 2 and Photo in Attachment 5) are 30 feet high and have color temperatures of 5,000-6,000 K. The existing fixtures will be replaced with 5,700 K full-cutoff LED fixtures and/or luminaires with additional direction/shielding by the end of the year 2016

   c) The 8 floodlight fixtures at the Recreation Center Pool (shown on Map in Figure 2 and Photo in Attachment 5) are 25 feet high and have color temperatures of 5,000-6,000 K. The existing fixtures will

be replaced or retrofitted with 5,700 K full-cutoff LED fixtures and/or luminaires with additional direction/shielding within the years 2018-2019.

d) The 8 floodlight fixtures at the Women's Tennis Courts south of Harder Stadium (shown on Map in Figure 2 and Photos L147-148 in Attachment 3) are 30 feet high and have been retrofitted with 5,700 K full-cutoff LED fixtures that have been specified for application in parking lots (see Attachment 8).

2. Athletics

a) The 8 floodlight fixtures at the Campus Pool (shown on Map in Figure 2 and photo in Attachment 6) are 35 feet high. These fixtures are located outside the approved boundary for outdoor sports lighting and they are considered a non-conforming use/structure. The University would not likely replace or retrofit these fixtures. Should the University determine that these fixtures are to be replaced or retrofitted, a Long Range Development Plan Amendment will be prepared and submitted accordingly.

b) The 6 stadium high-mast floodlight fixture clusters at Harder Stadium (shown on photo in Attachment 6) have been retrofitted with semi-cutoff luminaires. The 15 rim light fixtures (as specified in Attachment 8) at Harder Stadium have been retrofitted with full-cutoff fixtures and are compliant with Dark Sky and ESHA/Open Space objectives.

B. Athletics and Recreational Sports Facilities Lighting Specifications & Implementation

As required by Policy ESH-15, new and retrofitted outdoor sports lighting shall not exceed the minimum level of power and brightness necessary for the proposed level or collegiate or intramural use, shall use the best available technology and lighting spectrums which minimize lighting impacts on sensitive species and habitat, be located at the minimum standard pole height, and not exceed a color temperature of 5,700K. New or retrofitted sports lighting identified within the "Limits of Outdoor Sports Lighting Map" require a Commission-approved NOID, and shall mitigate the impact of new lighting by retrofitting or removing existing sports lighting and other outdoor lighting sources consistent with the identified priorities in section B of LRDP Policy ESH-15.

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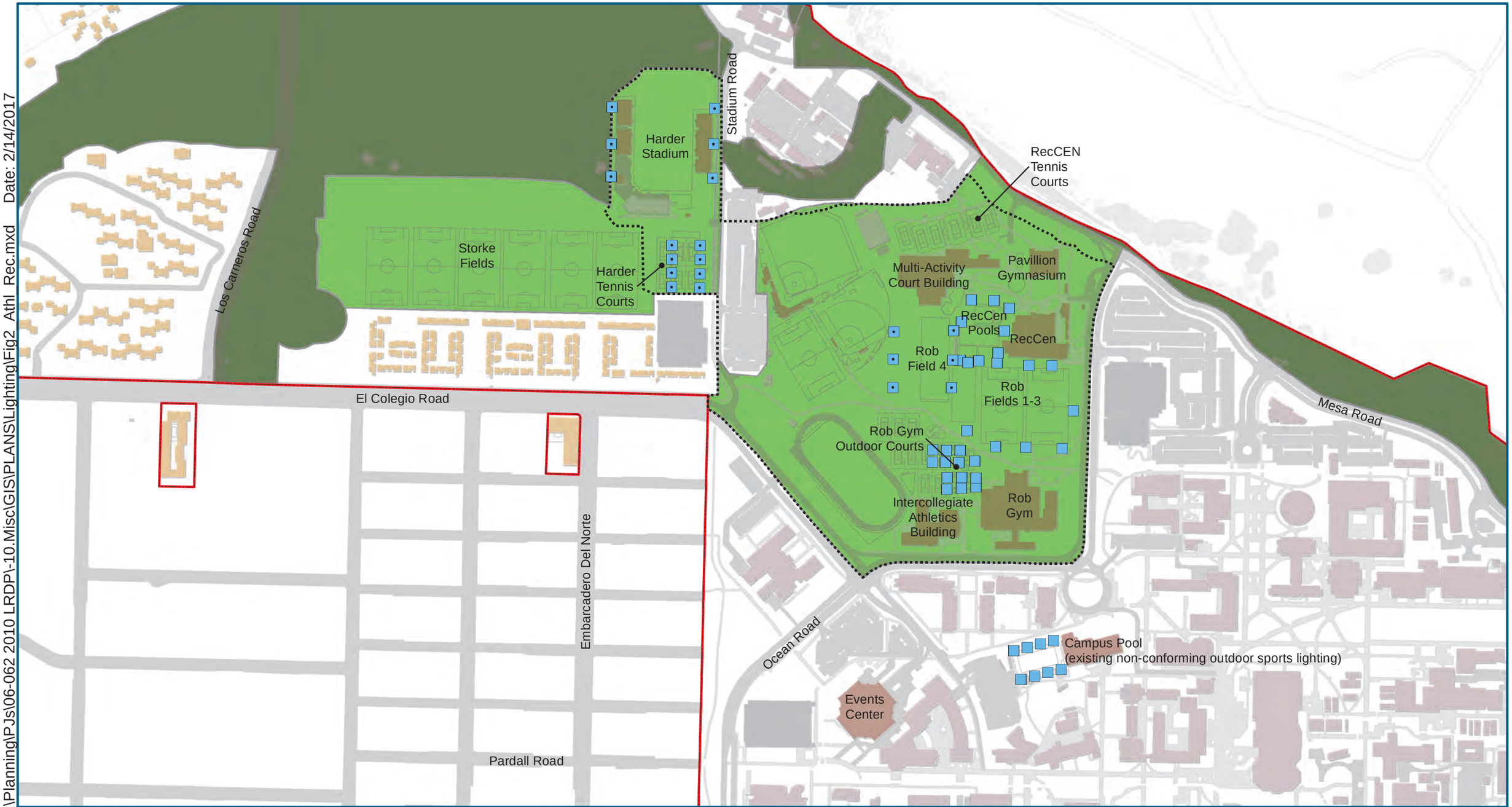

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Athletics and Recreational Sports Facility Lighting

Map of lighting fixtures scheduled for replacement or retrofit.

Light Fixture

- Outdoor Sports Lighting Fixtures
- Replaced/Newer Fixtures
- Limits of Outdoor Sports Lighting
- UCSB Boundaries
- Open Space
- Recreation

Vision 2025 UC Santa Barbara Long Range Development Plan

Office of Campus Planning & Design | **OUTDOOR LIGHTING REPLACEMENT AND RETROFIT PROGRAM** | **2016**

Figure 2.

C. Fixtures Adjacent to ESHA and Open Space

The second highest priority for replacement and/or retrofit of non-compliant fixtures is assigned to fixtures adjacent to ESHA, wetlands, and open space. There are 7 areas that contain non-compliant fixtures adjacent to ESHA and Open Space. All of these fixtures would either be retrofitted with full-cutoff and full-shielding and/or directional luminaire, replaced with a modern fully-shielded and/or directional version, or replaced with either a fully-shielded full-cutoff fixture or similar compliant fixtures within the years 2016-2019. The OSQ LED Street/Area fixtures (with a color temperature/spectrum of 3,000 Kelvin/CRI 80) on Attachment 8 and 9 are appropriate in areas adjacent to ESHA, wetlands, open space, or other areas where a fixture is intended to minimize light spill. The retrofit or replacement would be sited/located at the proper height, angle/directional LED optic (if applicable to fixture), and proximity to ensure that backlight, light spill and trespass is avoided on the non-targeted areas of adjacent ESHA Overlay and Open Space LRDP Land Use Designation; and to ensure that only the desired target areas are illuminated. The adjacent non-compliant fixtures are shown on Figures 3 and 4; and a summary of the fixtures is listed in Table 2 below.

Table 2. Inventory of Fixtures Adjacent to ESHA and Open Space, August 2016

Campus Area	Globe Fixtures	Other Fixtures	Total
Devereux	1	23	24
West Campus Family Apartments	4	0	4
Santa Ynez and Storke Family Apartments	24	28	52
Whittier Drive		4	4
Facil.Mgt./EH&S/Public Safety	15	4	19
Harold Frank Hall	4	0	4
Marine Biotechnology Laboratory Building	10	0	10
San Rafael/Faculty Club	2	5	7
		Total	**124**

Generally, most of the adjacent non-compliant fixture targets are bike and/or pedestrian paths, parking lots, and motor vehicle roads. Except for locations where minimal light spill is needed for safety purposes, the siting criteria for these non-compliant fixtures will minimize light spill and trespass by requiring one or more of the following:

- A maximum fixture height of 10 feet along the path traversing the West Storke Wetlands between Storke Family Housing and Santa Ynez Apartments, and other sensitive locations where applicable.
- Fully-shielded directional luminaires that aim the light onto target areas and avoid light spill onto ESHA or Open Space areas where present.
- Photoelectric switches, time switches, or astronomic time switches – depending upon target use type.
- Luminaires should have maximum color temperature of 3,200 K and minimum Color Rendering Index (CRI) of 80.

D. Alternate Schedule/General Implementation

Alternately, the remaining priorities will be assigned a general implementation of replacement/retrofit. Fixtures may also be assigned a higher priority when they are in close

proximity to proposed development associated with a Notice of Impending Development (NOID). Each proposed NOID will include an update of measurable goals to be implemented as part of the Outdoor Lighting Plan. This approach will ensure full replacement/retrofit within ten years of certification (December 2014) of the 2010 LRDP. Generally, the Campus will be divided into areas that are associated with five phases of implementation, as shown on the map in Attachment 1. The fixtures in each of the areas will be prioritized into five phases:

1. Phase I. Northeast quarter of Main Campus (Figure 5)
   249 fixtures, to be addressed within the years 2018-2020
2. Phase II. Northwest quarter of Main Campus (Figure 6)
   67 fixtures, years 2020-2021
3. Phase III. Southwest quarter of Main Campus (Figure 7)
   37 fixtures, years 2021-2022
4. Phase IV. Southeast quarter of Main Campus (Figure 8)
   74 fixtures, years 2021-2023
5. Phase V. Storke, North and West Campuses (Figure 9)
   50 fixtures, years 2022-2024

Storke Road
Los Carneros Road
Harder Stadium
Storke Fields
Harder Tennis Courts
El Colegio Road
Camino Corto
Embarcadero Del Norte
Isla Vista
Slough Road
Devereux North Knoll
Devereux South Knoll
Del Playa Drive

0 300 600 Feet

West and Storke Campus ESHA and Open Space Proximity.
Map of lighting fixtures scheduled for replacement or retrofit.

Open Space
ESHA Buffers
ESHA Overlay
UCSB Boundaries

Light Fixture Type
Conical
Globe
Other

Maintenance Responsibility
C = Campus/Administration
H = Housing

Vision 2025 UC Santa Barbara Long Range Development Plan

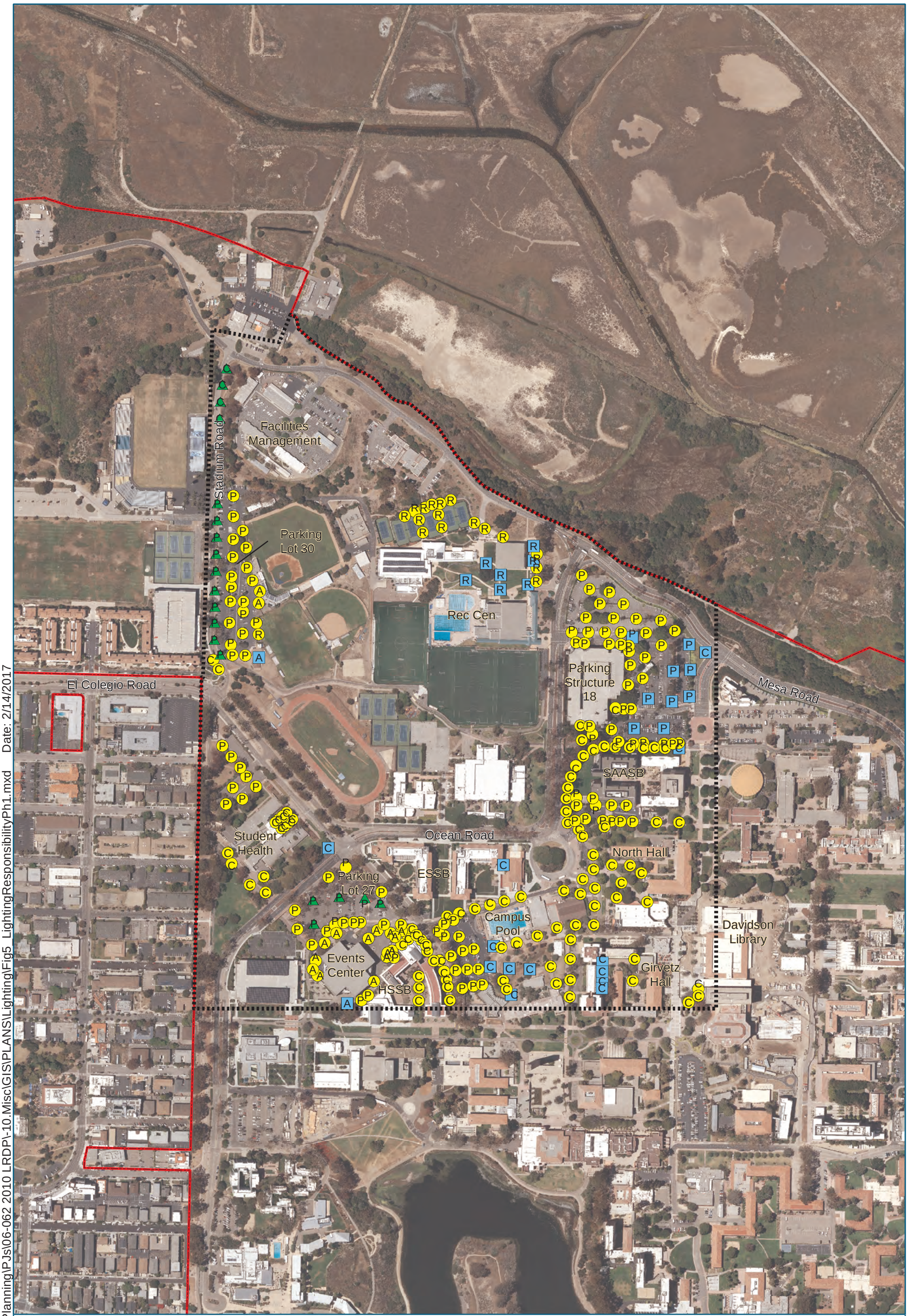
Figure 3.

Main Campus ESHA and Open Space Proximity.

Map of lighting fixtures scheduled for replacement or retrofit.

Vision 2025 UC Santa Barbara Long Range Development Plan

Document Path: G:\Planning\PJs\06-062 2010 LRDP\-10.Misc\GIS\PLANS\Lighting\Fig4 ESHA OS Main.mxd Date: 2/14/2017



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0 150 300 Feet

General Implementation Phase II

Map of lighting fixtures scheduled for replacement or retrofit.

Light Fixture Type

- Conical
- Globe
- Other

- Phase II Area
- UCSB Boundaries

Maintenance Responsibility
C = Campus/Admin.
P = Parking

Vision 2025 UC Santa Barbara Long Range Development Plan

Figure 6

Davidson Library
Bio-Engineering
Webb Hall
Bren Hall
Parking Lot 1
Noble Hall
MSRB
Lagoon Road
Psychology
Life Sciences
Biological Sciences 2
Santa Rosa Hall
Anacapa Hall

0 150 300 Feet

General Implementation Phase III

Map of lighting fixtures scheduled for replacement or retrofit.

Light Fixture Type
- Conical
- Globe
- Other

Phase III Area
UCSB Boundaries

Maintenance Responsibility
C = Campus/Admin.
H = Housing
P = Parking

Vision 2025 UC Santa Barbara Long Range Development Plan

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0 150 300 Feet

General Implementation Phase IV

Map of lighting fixtures scheduled for replacement or retrofit.

Light Fixture Type

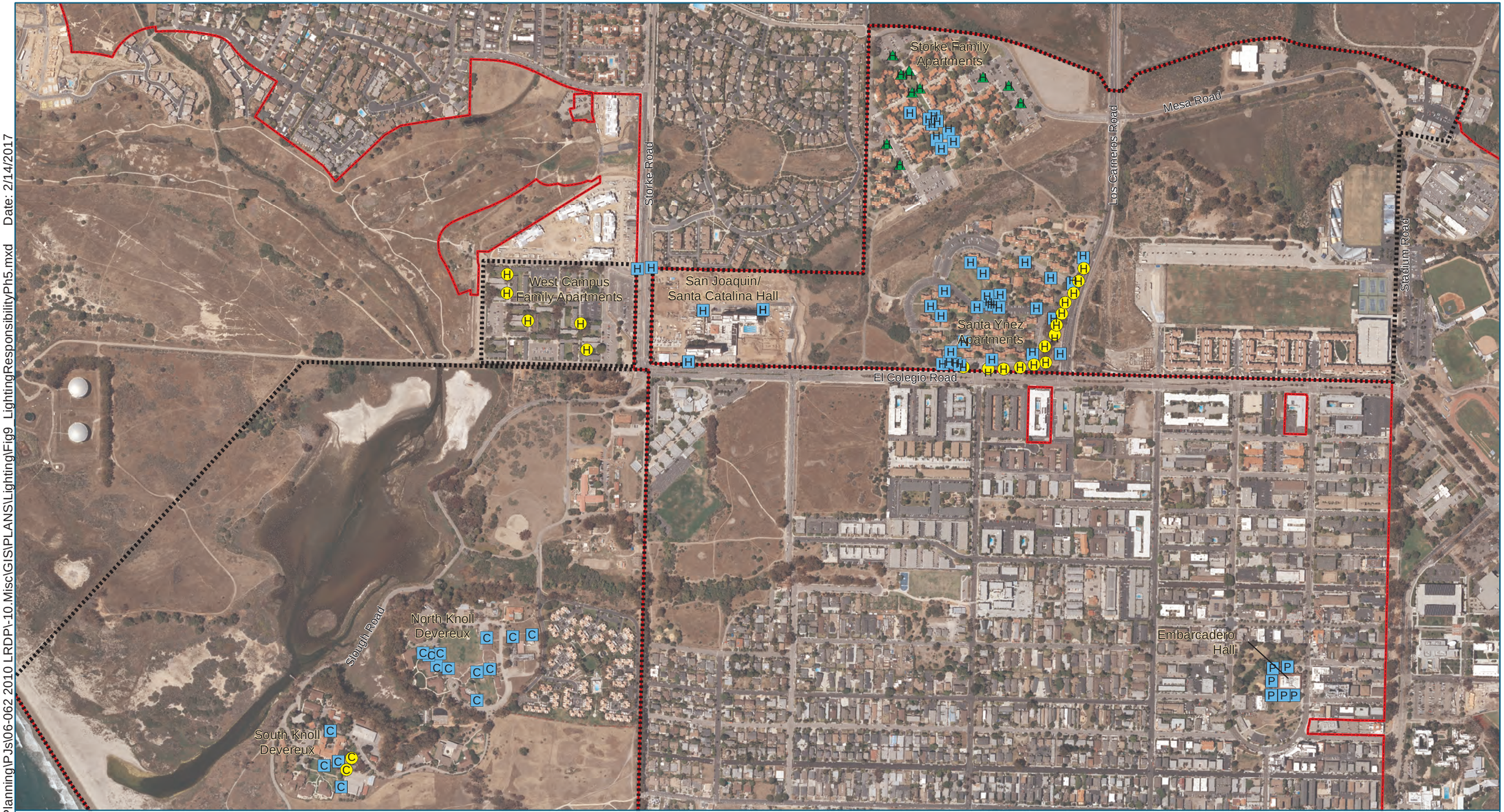
- Conical
- Globe
- Other

Phase IV Area

UCSB Boundaries

Maintenance Responsibility
C = Campus/Admin.
H = Housing
P = Parking

Vision 2025 UC Santa Barbara Long Range Development Plan



0 300 600 Feet

General Implementation Phase V

Map of lighting fixtures scheduled for replacement or retrofit.

Phase V Area
UCSB Boundaries

Light Fixture Type
Conical
Globe
Other

Maintenance Responsibility
C = Campus/Administration
H = Housing
P= Parking

Vision 2025 UC Santa Barbara Long Range Development Plan

Figure 9.

E. Proposed Outdoor Lighting Fixture Specifications

Generally, most fixture retrofits or replacements will incorporate LED technology because it will improve energy efficiency, allow more adaptive control over level of illumination, and increase lamp lifecycle (International Dark-Sky Association 2015). The proposed fixture specification for most campus locations is commonly referred to as the "Campus Standard" fixture (also known as the EcoSwap LED and CAND2 LED) (see Specifications Sheet in Attachment 7). The Campus Standard would typically be the replacement at most of the existing Globe fixture locations. The Campus Standard is a fixture typically mounted at 14 feet high on an aluminum pole, but they could be mounted as low as 10 feet above ground in applications to reduce light spill. The height of 14 feet creates an optimum lighting coverage with minimal overcasting. The minimum mounting height is typically 10 feet above ground. The Campus Standard fixture has a full-cutoff visor with a backlight shield/house-side shield option (see definition in Attachment 2) and LED lamp with a color temperature/spectrum of 4,000 Kelvin/CRI 70.

The Campus Standard fixture will not be appropriate for all locations and the specification may be changed as improved technology or standards are implemented to carry out the dark sky and ESHA and Open Space protection provisions of Policy ESH-15. Unique locations including parking lots, roadways, fixtures attached to buildings (wall packs), bike paths, and locations within or near ESHA will use fixtures other than the Campus Standard such as the XSPW LED Wall Mount, XSP2 LED Street/Area and OSQ LED Area/Flood Luminaire as shown on Attachments 8-10. Generally, the color temperature/spectrum of these fixtures would be the same as the Campus Standard (not to exceed 4,000 Kelvin and no less than a CRI of 70). When installation areas may affect sensitive populations of humans and/or animals, backlight shields and luminaires with color temperature of less than 3,001 K and CRI greater than 79 will be used. The following specifications provide a general guide to replacement or new application, although actual installations may vary slightly. Parking lot applications would generally utilize the specification in Attachment 8 (OSQ LED Area/Flood Luminaire). The fixture would be mounted 14 to 20 feet above ground. Roadway applications would typically utilize the specification in Attachment 9. The fixture would be mounted 20 to 30 feet above ground. Wall packs attached to buildings would generally adhere the specifications in Attachment 10. Mounting height of wall packs would likely be a maximum of 20, but may vary according to building and location. Bike path locations would typically utilize the specifications in Attachment 10. Mounting height of bike path fixtures would be a maximum of 14 feet above ground, although some applications near ESHA may be as low as 10 feet above ground and will incorporate backlight shield with front-facing optics and/or rotatable optics, and adjustable light level/dimmer.

Given the recent proliferation of new and improved technologies in LED lighting, the campus standard and/or other specifications in Attachments 8-10 may be

updated or replaced as improved technology becomes available over the next ten years. The Outdoor Lighting Plan would be updated if a significant change in specifications occurs.

VI. DEFINITIONS

Backlight – Light emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.

Color temperature – A characteristic of visible light that can be stated in the unit of absolute temperature, the kelvin, having the unit symbol K. The temperature of outdoor lighting in this context can be categorized from "warm"/yellowish white through red (e.g. a match flame at 1,700 K), to "cool"/blueish white (e.g. outdoor sports lighting around 5,700 K), to daylight around 6,500 K, to clear blue poleward sky in the range of 15,000 K - 27,000 K.

CRI – Color rendering index is a quantitative measure of the ability of a light source to reveal the colors of various objects faithfully in comparison with an ideal or natural light source. The CRI is determined by the light source's spectrum. The CRI of outdoor lighting in this context can be categorized from low (e.g. high-pressure sodium luminaires at 24) to high (e.g. incandescent or halogen bulbs at 100).

Curfew – A time when outdoor lighting is reduced or extinguished.

Cutoff fixture – An Illumination Engineering Society of North America definition; "Intensity at or above 90° (horizontal) no more than 2.5% of lamp lumens, and no more than 10% of lamp lumens at or above 80°".

Full-cutoff fixture – An Illumination Engineering Society of North America definition; "Zero intensity at or above horizontal (90° above nadir) and limited to a value not exceeding 10% of lamp lumens at or above 80°".

Fully shielded luminaire – A luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.

Glare – Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.

Light pollution – Any adverse effect of artificial light including, but not limited to, glare, light trespass, sky-glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

Lighting – "Electric" or "man-made" or "artificial" lighting. See "lighting equipment".

Lighting equipment – Equipment specifically intended to provide electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(es), and related structures, electrical wiring, and other necessary or auxiliary components.

Light spillage – The unintended lighting of areas outside of the useful target areas.

Light trespass – The falling of light where it is not wanted, such as light casting onto a habitat area, habitat buffer, or across a property line onto an adjoining lot or public right-of-way. The measurement of light trespass shall be determined by a photometer, taken at the subject property line or the outer extent of a habitat area or habitat area buffer.

Lumen – Unit of luminous flux; the flux emitted within a unit solid angle by a point source with a uniform luminous intensity of one candela.

Luminaire – The complete lighting unit (fixture), consisting of a lamp, or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to the power supply.

Motion detector – A device that detects moving objects (particularly people) and turns lights on.

Mounting height – The height of the photometric center of a luminaire above grade level.

Nadir – A point on the earth directly below the observer, diametrically opposite the zenith.

New lighting – Lighting for areas not previously illuminated; newly installed lighting of any type except for replacement lighting or lighting repairs.

Outdoor lighting – Lighting equipment or light fixtures used to provide illumination for outdoor areas, objects, or activities, including light fixtures attached to buildings or structures. Self –supporting structures to provide lighting for parking lots, walkways, building entrances, outdoor sales areas, recreational fields, or within landscaped areas shall all constitute outdoor lighting.

Photoelectric switch – A control device employing a photocell or photodiode to detect daylight and automatically switch lights off when sufficient daylight is available.

Replacement lighting – Lighting installed specifically to replace existing lighting that is sufficiently broken to be beyond repair.

Retrofit – Rather than replace a lighting fixture, a retrofit would renovate older lighting luminaire/component technology to improve energy efficiency, reduce heat emissions, improve lighting output (if applicable), refine target areas, and improve the color temperature of the light emitted (if applicable).

Semi-cutoff fixture – An Illumination Engineering Society of North America definition; “Intensity at or above 90° (horizontal) no more than 5% of lamp lumens and no more than 20% at or above 80°”.

Shielded directional luminaire – A luminaire that includes an adjustable mounting device allowing aiming in any direction and contains a shield, louver, or baffle to reduce direct view of the lamp.

Sky glow – The brightening of the nighttime sky from outdoor light directed toward the sky or reflected into the sky. Sky glow is exacerbated by a high percentage of water vapor (inclement weather) and/or dust particles in the atmosphere.

Spectrum – Within the field of optics, a word used to describe the rainbow of colors in visible light when separated using a prism, or transparent triangular-shaped piece of glass material.

The rainbow of colors is not limited to a specific set of values, but can vary infinitely within a continuum, or gradual quantitative transitions without abrupt changes.

Target – The area intended for illumination (e.g. parking lot, sidewalk, bike path, road, etc.)

Time switch – An automatic lighting control device that switches lights according to time of day (or curfew)

Unshielded luminaire – A luminaire capable of emitting light in any direction, including downwards.

Zenith – An imaginary point located at an arbitrary altitude directly "above" a particular location on earth.

VII. REFERENCES

Dark Sky Society. *Guidelines for Good Exterior Lighting Plans.*2009 www.DarkSkySociety.org Web May 13, 2016.

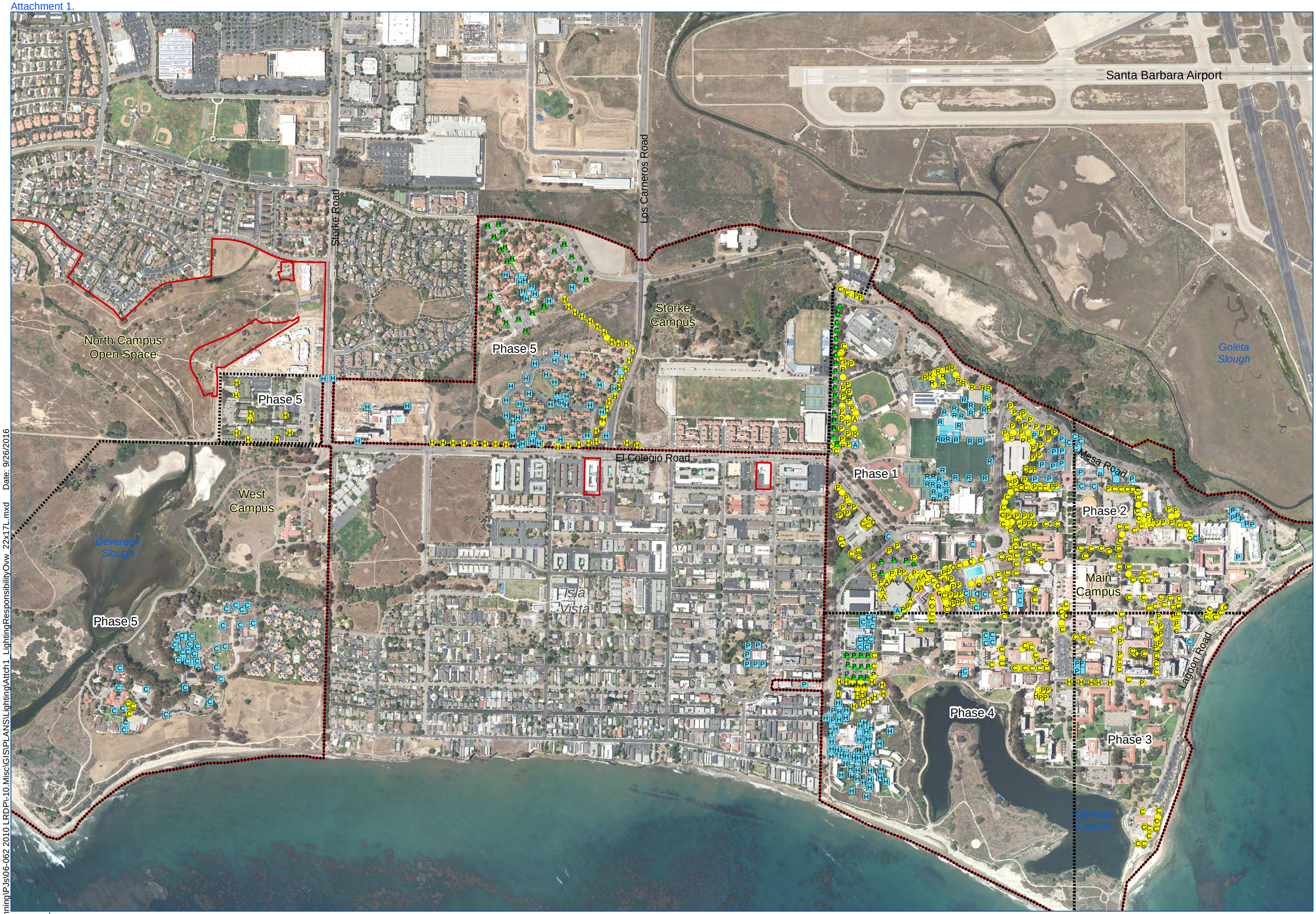
PS2 Engineering, Inc. *Exterior Lighting Study University of California, Santa Barbara.* 2011.

Illuminating Engineering Society and International Dark-Sky Association. *Joint IDA-IES Model Lighting Ordinance (MLO) with User's Guide.* June 15, 2011.

International Dark-Sky Association. *The Promise and Challenges of LED Lighting: A Practical Guide.* Rev. January 27, 2015. www.darksky.org/lighting/led-practical-guide. Web May 13, 2016.

Attachment 1. Overview Map

Attachment 1.



0 300 600 1,200 Feet

Light Fixture Type
- Conical
- Globe
- Other

- Lighting Plan Phasing
- UCSB Boundaries

Campus Groups with Fixture Maintenance Responsibility
A = Athletics
C = General Campus Administration
H = Housing and Residential Services
P = Transportation and Parking Services
R = Recreational Sports

Vision 2025 UC Santa Barbara Long Range Development Plan

Office of Campus Planning & Design

OUTDOOR LIGHTING REPLACEMENT AND RETROFIT PROGRAM
Overview Map of Fixtures Scheduled for replacement or retrofit.

2016

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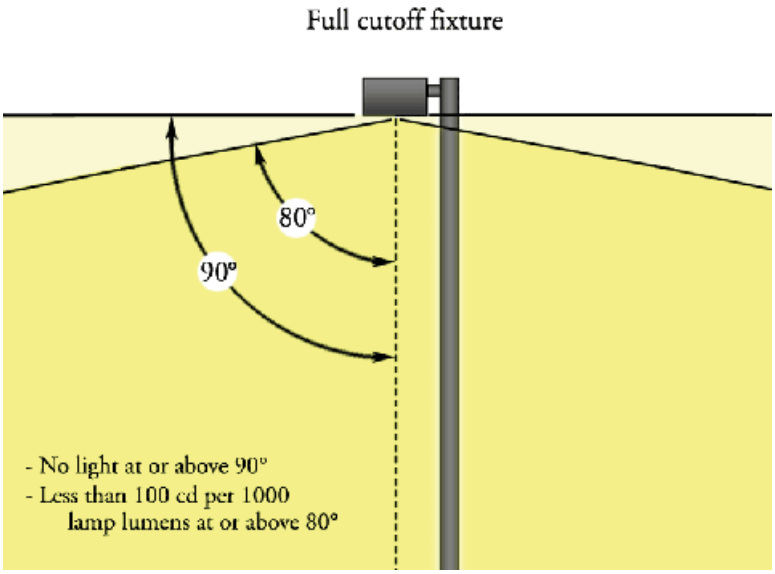
Attachment 2. Dark Sky Society Definitions and Diagrams

Attachment 2.

Page 4 taken from The Dark Sky Society's *Guidelines for Good Exterior Lighting Plans. 2009* http://www.darkskysociety.org

Definition of Acceptable Fixtures: "Full Cut Off", "Fully Shielded", and RLM shield.



- **"Full Cut Off" fixtures are independently certified by the manufacturers, and do not allow light to be emitted above the fixture and the fixture reduces glare by limiting the light output to less than 10% at and below 10 degrees below the horizontal.**
- **If the manufacturer is unable to provide the "cut off" characteristics for a fixture (also called a "luminaire"), the following definition needs to be met, which can usually be determined by a visual inspection:**

"Fully Shielded": a fixture constructed and installed in such a manner that all light emitted by it, either directly from the lamp (bulb) or a diffusing element, or indirectly by reflection or refraction from any part of the fixture, is projected below the horizontal. This can be determined by a "field test" or a visual assessment of an operating sample.

- **Manufacturers and their representatives can provide photographs of light fixtures as "cut sheets" as well as literature confirming the independently tested "cut off" characteristics of their products. These IES files may be assessed for compliance in a computer program: http://www.3dop.com/index1.html**
- **Photometric layouts for different heights, light sources, and wattages, are also available as "IES" files, upon request or through manufacturers' websites.**
- **Fixtures must be installed properly, so that the bottom of the fixture is level with the ground. Exceptions are often given for sign lighting which requires vertical lighting:**

"RLM" sign lighting shield:

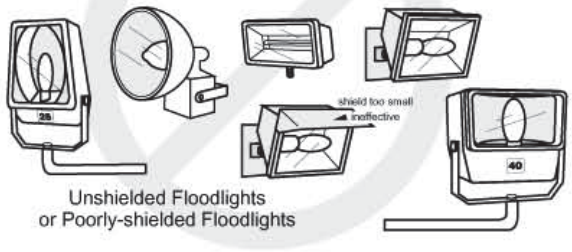
Attachment 2.

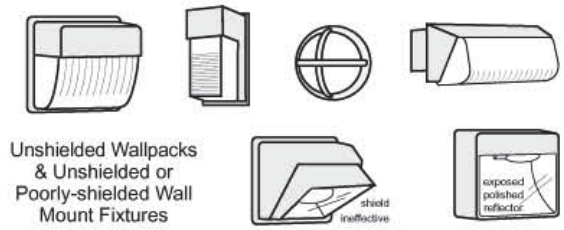
Good Lights for Good Nights

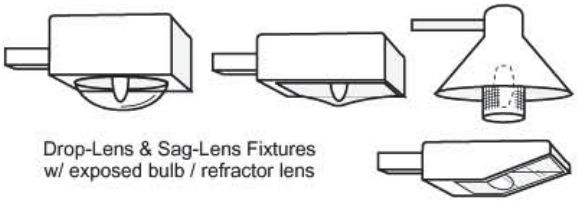
Help eliminate light pollution. Select the best fixture for your application using this guide. Use the lowest wattage bulb appropriate for the task and turn off the light when it's not being used.

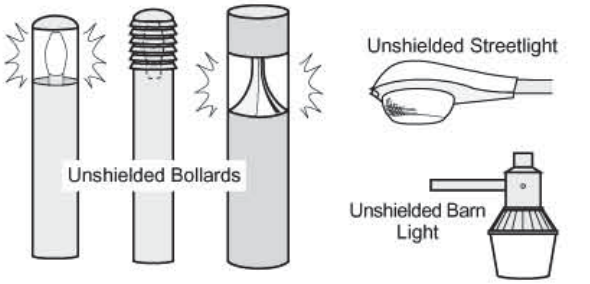
Unacceptable / Discouraged

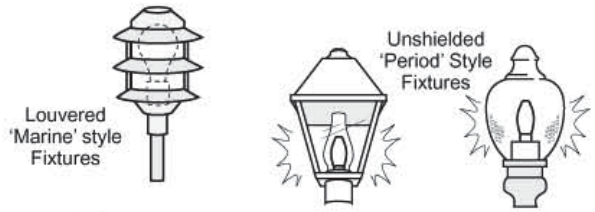
Fixtures that produce glare and light trespass

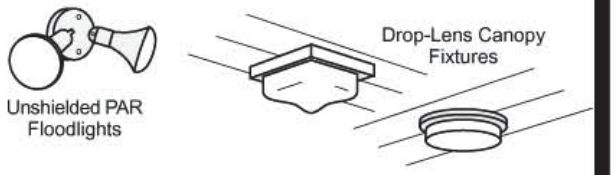






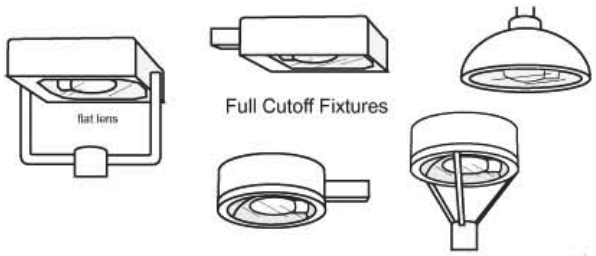


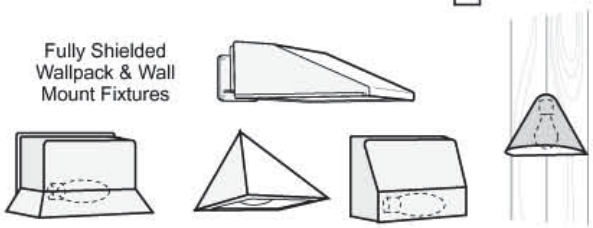


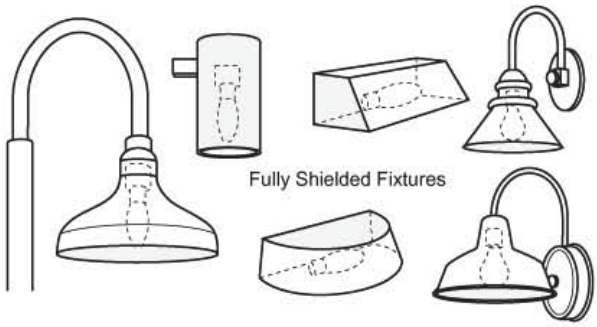


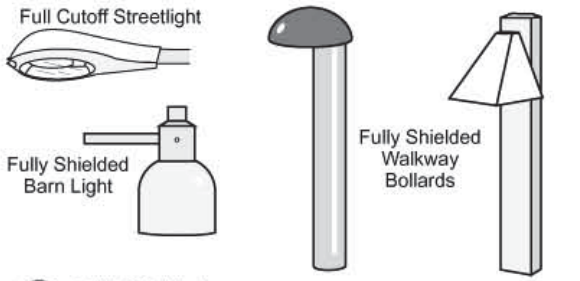
Acceptable

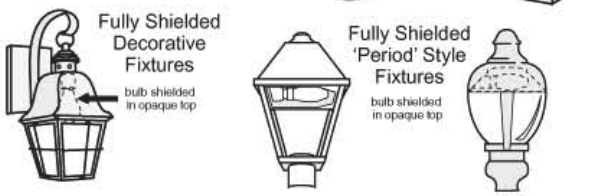
Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night

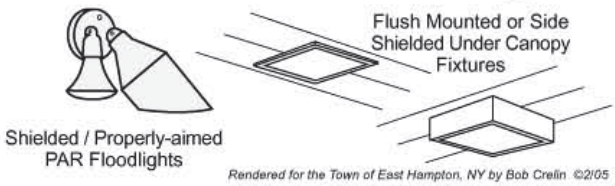












Rendered for the Town of East Hampton, NY by Bob Crelin ©2/05

presented by the

Dark Sky Society

www.darkskysociety.org

Attachment 3. Existing Fixture Photos

APPENDIX D

Lighting Fixture Photos by Type.

L1

L2

L3

L4

L5

L6

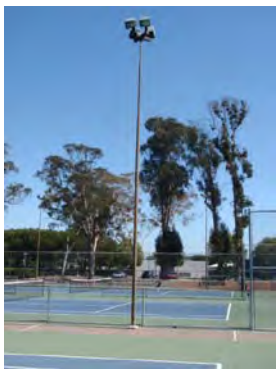
Attachment 3.

L143

L144

L145

L146



L147

L148

L149

L150

Attachment 3.

L39

L40

L41

L42

L43

L44

L45

L46

Attachment 4. Photos of Rob Field Outdoor Lighting Fixtures

Attachment 4. Rob Field Existing Fixture Photos

ROB FIELDS 1-3 – MUSCO METAL HALIDE ‘SPORTSCLUSTER 2’

ROB FIELD 4 – MUSCO METAL HALIDE ‘LIGHT STRUCTURE GREEN’

Attachment 5. Photos of Outdoor Lighting Fixtures at Rob Gym Outdoor Court and RecCen Pool

Attachment 5.

Rob Gym Outdoor Courts

RecCen Pool

Attachment 6. Photos of Outdoor Lighting Fixtures at Campus Pool and Harder Stadium

Attachment 6.

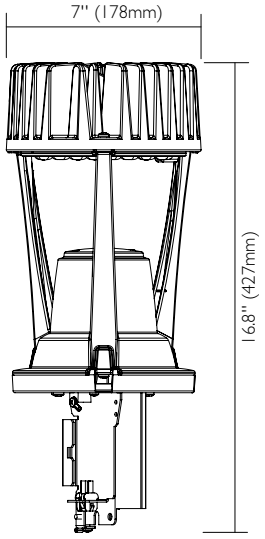
Campus Pool

Harder Stadium

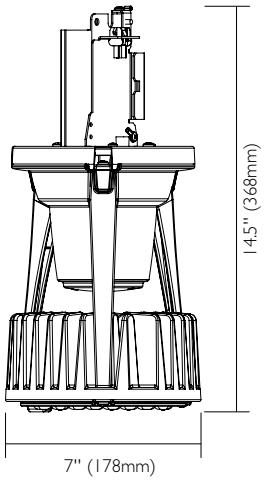
Attachment 7. Campus Standard Fixture Specifications Sheet

EcoSwap
Data Sheet

For Post Top Luminaire



For Pendant Luminaire



EcoSwap is a LED light engine for existing Philips Lumec outdoor lighting fixtures offering performance and longevity.

EcoSwap allows you to switch to LED lighting and have great energy savings and longevity while keeping the same outdoor lighting infrastructure. It is the first and only light engine to offer luminaire thermal analysis conducted inside the luminaire which garantees the performance and longevity of the LED light engine. For retrofit, EcoSwap offers the most lumen output per watt on the market.

Characteristics

- Quick and easy tool less installation / retrofit
- Better performance wattage of light output produced is 6889 lumens (best in the industry)
- Optimal thermal management
- Lifespan up to 100,000 hours
- More than 60% in energy savings
- Tested in real luminaire conditions
- Tested by independent certified labs
- Durable and environmentally responsible since you keep your existing lighting infrastructure

Typical Applications

- Optimal for retrofit projects: Candela, Zenith, New Westminster and Contemporary Lantern
- Ideal for decorative luminaires with frosted, prismatic and translucent glass globes

LED Lamp Details

These LED lamp details are showing typical delivered lumens relative to the LED light engine EcoSwap only (not for the luminaire as a whole). For the data of the luminaire with EcoSwap, please refer to the technique file of the appropriate luminaire.

LED = Philips Lumileds Luxeon R, CRI = 70, CCT = 4000K (+/- 350K)
LED rated life = 70,000 hrs[1] - Driver rated life = 100,000 hrs

Lamp	Typical delivered lumens [2]	Typical lamp wattage (W)	Typical system wattage[3] (W)	Typical current @ 120 V (A)	Typical current @ 240 V (A)	Typical current @ 277 V (A)	LED current (mA)	HPS equivalent[4]	Luminaire Efficacy Rating (Lm/W)
40W42LED4K-R	4753	40	45	0.48	0.24	0.22	333	70	106
65W42LED4K-R	6889	65	70	0.72	0.36	0.32	500	100	98

1 L70 = 70,000 hrs (at ambient temperature = 25°C and forward current = 500 mA).
2 May vary depending on the optical distribution used. Data provided are for the module alone, outside of a fixture.
3 System wattage includes the lamp and the LED driver.
4 Equivalence should always be confirmed by a photometric layout.
Note : Due to rapid and continuous advances in LED technology, LED luminaire data is subject to change without notice and at the discretion of Philips.

PHILIPS LUMEC

Optical System

EcoSwap

Rotomatic toolfree system composed of 4 main components:
LED lamp / Optical System / Heat Sink / Driver

Lamp

Lamp type Philips Lumileds Luxeon R. Composed of 42 high performance white LEDs, 40w/65w lamp wattage. Color temperature of 4000 Kelvin nominal, 70 CRI. Operating lifespan based on LM80 results after which 50% still emits over 70% (L70) of its original lumen output. Use of a metal core board insures greater heat transfer and longer lifespan of the light engine.

Optical System

Composed of high performance acrylic refractors lenses to achieve desired optimized distribution to get maximum spacing, target lumens will create a perfect lighting uniformity. Performance shall be tested by independent lab for LM63 and LM79 and TM15 (IESNA) certifying its photometric performance.

Heat Sink

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

Driver

High power factor of 90% min. Electronic driver, operating range 50/60 Hz. Auto adjusting to a voltage between 120 and 277 volt AC rated for both application line to line or line to neutral, Class II, THD of 20% max. Maximum ambient operating temperature from -40F (-40C) to 130F (55C) degrees. Certified in compliance to cULus requirement. Dry and damp location. Assembled on a unitized removable tray with Tyco quick disconnect plug resisting to 221F (105C) degrees.

The current supplying the LEDs will be reduced by the driver if the internal temperature exceeds 185F (85C), as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction.

Electrical components are RoHS compliant.

Photometric Distributions

RLE3: Asymetrical
RLE5: Asymetrical (Square)

Voltages

120 / 208 / 240 / 277

Luminaire Lighting Controls

DMG → Driver is compatible with dimmer from 0 to 10 volts.

Luminaire Options

HS → House side shield

Ordering Example

Luminaire	Lamp	Optical System	Voltage	Driver Options	Luminaire Options	Finish
CAND2	40W42LED4K-R	RLE3	240	DMG	HS	GR

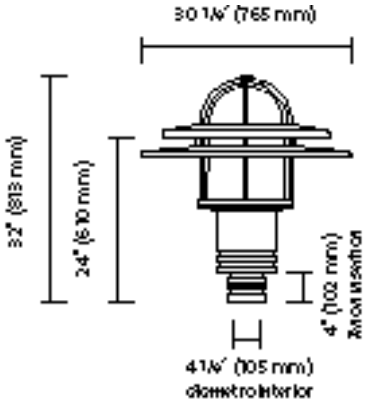
PHILIPS LUMEC

CAND2

CANDELA SERIES

LUMINAIRES

*Conform to the **UL 1598** and **CSA C22.2 No. 250.0-08** standards*



CAND2
E.P.A.: 2.43 sq. ft.
Weight: 44 lbs (20.0 kg)

These globes are available in the following finishes:

PCC: Clear Polycarbonate
PCO: Opal Polycarbonate
PCCPD: POND Polycarbonate

CAND1-CN1, CANDS1-CN1S and CANDS1-CNS-M luminaires are UL and CSA approved

Horizontal junction box of 2" x 3" (51 x 76 mm) and 4 anchor bolts of 3/8" Ø (9.5 mm) not included

- *4" (102 mm) Octogonal junction box not recommended*
- *4" (102 mm) junction box is suitable*
- *Structural members must be present in wall to accept bolts*

SPECIFICATIONS

Guard
Made from round shaped bent aluminum(6063T5) of 1/2" (13 mm) rods, mechanically assembled to the access mechanism.

Fitter
made from die cast aluminum (356) c/w 4 set screws 3/8 16 UNC. Fits on a 4" (102 mm) outside diameter by 4" (102 mm) long tenon.

Wiring
Gauge (#14) TEW wires, 6" (152 mm) minimum exceeding from luminaire.

Hardware
All exposed hardware is stainless steel. All seals and sealing devices are made of and/or lined with EPDM and/or silicone.

Finish
"Hot dip" chemical etching preperation. Lumital™ polyester powder coat finish. Excellent color retention as per #ASTM D2244, and outstanding salt-spray resistance according to #ASTM B117 testing procedures.

PHILIPS LUMEC

ORDERING INFORMATION

PRODUCT	LAMP	OPTICAL SYSTEM	VOLTAGE	FINISH[1]
CAND2	50 MH, medium 70 MH, medium 100 MH, medium 150 MH, medium 200 MH, mogul 250 MH, mogul 250 PSMH[1], mogul 35 HPS, medium 50 HPS, mogul 70 HPS, mogul 150 HPS, mogul 200 HPS[1], mogul 250 HPS[1], mogul 18 CF[2] 26 CF[2] 32 CF[2] 42 CF[2]	RR3 RR3MD RR5	120 208 240 277 347	BE2/TX BE6/TX BE8/TX BK/TX BR/TX GN/TX GN4/TX GN6/TX GN8/TX GY3/TX RD2/TX RD4/TX WH/TX NP TG TS
	40W42LED4K-R 65W42LED4K-R			

[1] *Remote ballast*

[2] *Socket: GX24Q-2 (18W), GX24Q-3 (26 or 32W), GX24Q-4 (42W), triple tube compact fluorescent (lamp not included)*

> *See end of document for details on line of poles available.*

LED LAMP DETAILS

These LED lamp details are showing typical delivered lumens relative to the complete luminaire with EcoSwap.

LED = Philips Lumileds Luxeon R, CRI = 70, CCT = 4000K (+/- 350K)
LED rated life = 70,000 hrs [1] - Driver rated life = 100,000 hrs

LAMP	TYPICAL DELIVERED LUMENS [2]	TYPICAL LAMP WATTAGE (W)	TYPICAL SYSTEM WATTAGE [3] (W)	TYPICAL CURRENT @ 120 V (A)	TYPICAL CURRENT @ 240 V (A)	TYPICAL CURRENT @ 277 V (A)	LED CURRENT (MA)	HPS EQUIVALENT[4]	LUMINAIRE EFFICACY RATING (LM/W)
40W42LED4K-R	3030	40	45	0.48	0.24	0.22	333	70	67
65W42LED4K-R	4460	65	70	0.72	0.36	0.32	500	100	64

[1] *L70 = 70,000 hrs (at ambient temperature = 25°C and forward current = 500 mA).*

[2] *May vary depending on the optical distribution used.*

[3] *System wattage includes the lamp and the LED driver.*

[4] *Equivalence should always be confirmed by a photometric layout.*

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

ORDERING SAMPLE

PRODUCT	LAMP	OPTICAL SYSTEM	VOLTAGE	FINISH
CAND2	250 MH	RR5	277	GN8TX

PHILIPS
LUMEC

Attachment 8. Parking Lot Fixture Specifications Sheet

OSQ Series

OSQ™ LED Area/Flood Luminaire – Medium

Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. 'A' Input power designator is a suitable upgrade for HID applications up to 250 Watt. 'J' Input power designator is a suitable upgrade for HID applications up to 400 Watt.

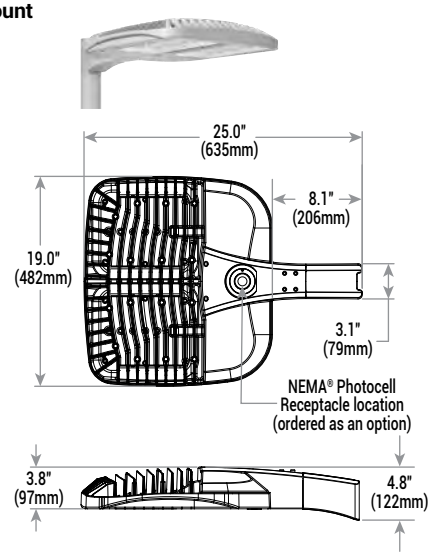
Applications: Parking lots, walkways, campuses, car dealerships, office complexes, and internal roadways

Performance Summary

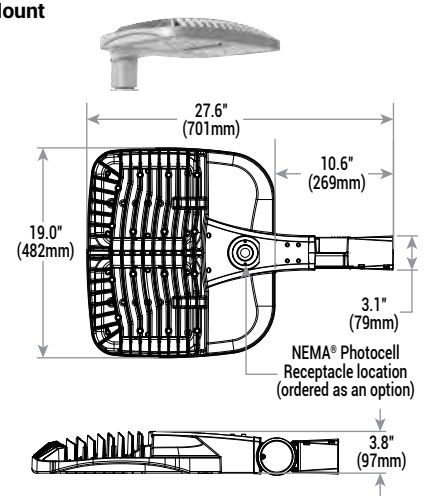
NanoOptic® Precision Delivery Grid™ optic
Made in the U.S.A. of U.S. and imported parts
CRI: Minimum 70 CRI (4000K & 5700K); 80 CRI (3000K)
CCT: 3000K (+/- 300K), 4000K (+/- 300K), 5700K (+/- 500K)
Limited Warranty†: 10 years on luminaire/10 years on Colorfast DeltaGuard® finish

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

DA Mount



AA Mount



Accessories

Field-Installed	
Backlight Shield	
OSQ-BLSMF – Front facing optics	OSQ-BLSMR – Rotated optics

Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:
Example: **Mount:** OSQ-AA-SV + **Luminaire:** OSQ-A-NM-2ME-A-40K-UL-SV

Mount (Luminaire must be ordered separately)			
OSQ-			
OSQ-AA Adjustable Arm **OSQ-DA** Direct Arm	**Color Options:**	**SV** Silver **BK** Black	**BZ** Bronze **WH** White

Weight
26.5 lbs. (12kg)

Luminaire (Mount must be ordered separately)								
OSQ	**A**	**NM**						
Product	**Version**	**Mounting**	**Optic**	**Input Power Designator**	**CCT**	**Voltage**	**Color Options**	**Options**
OSQ	**A**	**NM** No Mount	**2ME*** Type II Medium **3ME*** Type III Medium **4ME*** Type IV Medium **5ME** Type V Medium **5SH** Type V Short **WSN** Wide Sign **15D** 15° Flood **25D** 25° Flood **40D** 40° Flood **60D** 60° Flood	**A** 112W **J** 168W	**30K** 3000K **40K** 4000K **57K** 5700K	**UL** Universal 120-277V **UH** Universal 347-480V	**BK** Black **BZ** Bronze **SV** Silver **WH** White	**DIM** 0-10V Dimming - Control by others - Refer to Dimming spec sheet for details - Can't exceed wattage of specified input power designator **F** Fuse - When code dictates fusing, use time delay fuse **ML** Multi-Level - Refer to ML spec sheet for details - High: 100%, Low: 30% - Intended for downlight applications at 0° tilt **PML** Programmable Multi-Level, 20-40' Mounting Height - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt **PML2** Programmable Multi-Level, 10-30' Mounting Height - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt **Q9** Field Adjustable Output - Refer to Field Adjustable Output spec sheet for details **R** NEMA® Photocell Receptacle - Intended for downlight applications with maximum 45° tilt - Photocell by others **RL** Rotate Left - LED and optic are rotated to the left **RR** Rotate Right - LED and optic are rotated to the right

* Available with Backlight Shield when ordered with field-installed accessory (see table above)

Rev. Date: V7 12/01/2015

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

Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high performance heat sink
- Convenient interlocking mounting method on direct arm mount. Mounting adaptor is rugged die cast aluminum and mounts to 3-6" (76-152mm) square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" (51mm) centers
- Mounting for the adjustable arm mount adaptor is rugged die cast aluminum and mounts to 2" (51mm) IP, 2.375" (60mm) O.D. tenon
- Adjustable arm mount can be adjusted 180˚ in 2.5˚ increments
- Designed for uplight and downlight applications
- 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, bronze, black, and white are available
- **Weight:** 26.5 lbs. (12kg)

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- **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
- **10V Source Current:** 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R option
- Consult factory for CE Certified products
- 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 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 ARRA
- DLC qualified when ordered with 30K (5ME, 5SH optics), or 40K and 57K (2ME, 3ME, 4ME, 5ME, 5SH, 15D, 25D, 40D, 60D optics). Please refer to www.designlights.org/QPL for most current information
- Dark Sky Friendly, IDA approved. Please refer to www.darksky.org/ for most current information
- RoHS compliant. Consult factory for additional details

Electrical Data*

Input Power Designator	System Watts 120-480V	Total Current					
		120V	208V	240V	277V	347V	480V
A	112	0.97	0.56	0.49	0.43	0.34	0.25
J	168	1.47	0.85	0.74	0.64	0.50	0.36

* Electrical data at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

Recommended OSQ Series Lumen Maintenance Factors (LMF)[1]

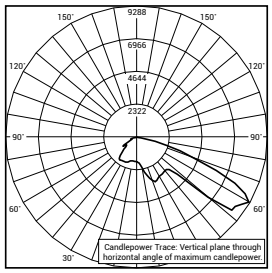
Ambient	Optic	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Projected/ Calculated[2,3] LMF	100K hr Calculated[3] LMF
5˚C (41˚F)	2ME, 3ME, 4ME	1.04	0.99	0.93	0.89	0.84
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.05	0.94	0.86	0.80	0.74
10˚C (50˚F)	2ME, 3ME, 4ME	1.03	0.98	0.93	0.88	0.83
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.04	0.93	0.86	0.79	0.73
15˚C (59˚F)	2ME, 3ME, 4ME	1.02	0.97	0.92	0.87	0.82
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.03	0.92	0.85	0.78	0.72
20˚C (68˚F)	2ME, 3ME, 4ME	1.01	0.96	0.91	0.86	0.82
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.01	0.90	0.83	0.77	0.71
25˚C (77˚F)	2ME, 3ME, 4ME	1.00	0.95	0.90	0.85	0.81
	5ME, 5SH, 15D, 25D, 40D, 60D, WSN	1.00	0.89	0.82	0.76	0.70

[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 time durations that are within 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)
[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)

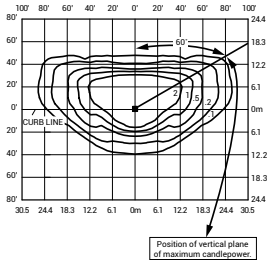
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

2ME



RESTL Test Report #: PL03347-001
OSQ-A-**-2ME-A-40K-UL
Initial Delivered Lumens: 10,988

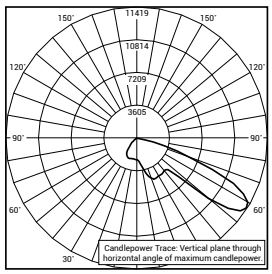


OSQ-A-**-2ME-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,356
Initial FC at grade

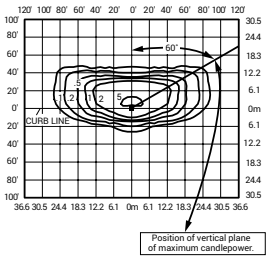
Type II Medium Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	9,136	B2 U0 G1	10,904	B2 U0 G2	11,649	B2 U0 G2
J	13,703	B2 U0 G2	16,356	B3 U0 G2	17,474	B3 U0 G2

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL03642-003
OSQ-A-**-2ME-J-40K-UL w/OSQ-BLSMF
Initial Delivered Lumens: 14,643



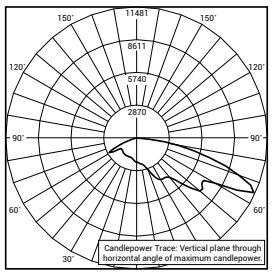
OSQ-A-**-2ME-J-40K-UL w/OSQ-BLSMF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 14,020
Initial FC at grade

Type II Medium w/BLS Distribution

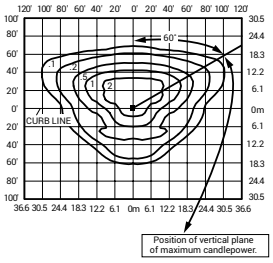
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	7,831	B1 U0 G1	9,346	B2 U0 G2	9,985	B2 U0 G2
J	11,746	B2 U0 G2	14,020	B2 U0 G2	14,978	B2 U0 G2

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

3ME



RESTL Test Report #: PL03478-001
OSQ-A-**-3ME-J-40K-UL
Initial Delivered Lumens: 16,257

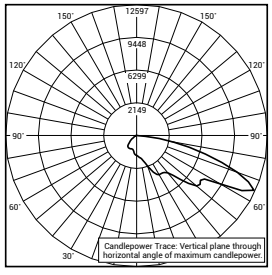


OSQ-A-**-3ME-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,189
Initial FC at grade

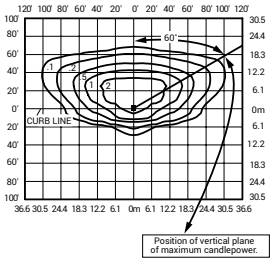
Type III Medium Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	9,042	B2 U0 G2	10,793	B2 U0 G2	11,530	B2 U0 G2
J	13,564	B3 U0 G3	16,189	B3 U0 G3	17,296	B3 U0 G3

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL03642-001
OSQ-A-**-3ME-J-40K-UL w/OSQ-BLSMF
Initial Delivered Lumens: 14,229



OSQ-A-**-3ME-J-40K-UL w/OSQ-BLSMF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,853
Initial FC at grade

Type III Medium w/BLS Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	7,737	B1 U0 G2	9,235	B1 U0 G2	9,866	B1 U0 G2
J	11,606	B1 U0 G2	13,853	B2 U0 G3	14,799	B2 U0 G3

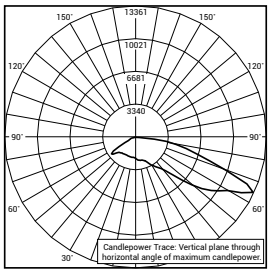
* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

OSQ™ LED Area/Flood Luminaire – Medium

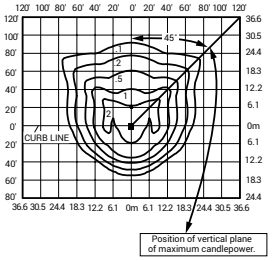
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

4ME



RESTL Test Report #: PL03496-001
OSQ-A-**-4ME-J-40K-UL
Initial Delivered Lumens: 16,293

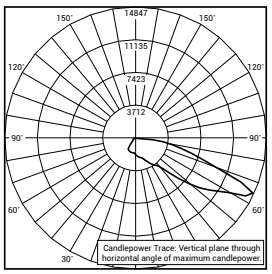


OSQ-A-**-4ME-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 16,022
Initial FC at grade

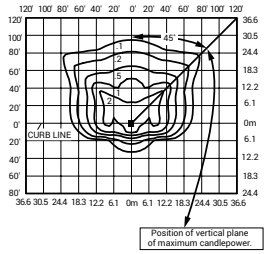
Type IV Medium Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	8,949	B2 U0 G2	10,682	B2 U0 G2	11,412	B2 U0 G3
J	13,424	B3 U0 G3	16,022	B3 U0 G3	17,117	B3 U0 G3

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL03642-002
OSQ-A-**-4ME-J-40K-UL w/OSQ-BLSMF
Initial Delivered Lumens: 13,647



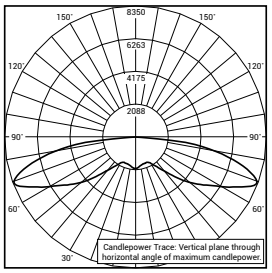
OSQ-A-**-4ME-J-40K-UL w/OSQ-BLSMF
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,686
Initial FC at grade

Type IV Medium w/BLS Distribution

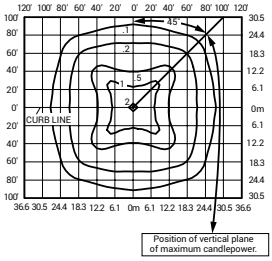
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	7,644	B1 U0 G2	9,124	B1 U0 G2	9,747	B1 U0 G2
J	11,466	B2 U0 G3	13,686	B2 U0 G3	14,621	B2 U0 G3

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

5ME



RESTL Test Report #: PL03466-001
OSQ-A-**-5ME-S-40K-UL
Initial Delivered Lumens: 20,709



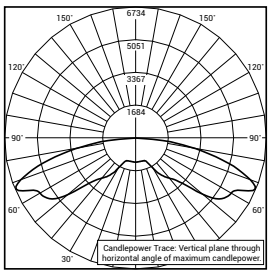
OSQ-A-**-5ME-A-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 13,686
Initial FC at grade

Type V Medium Distribution

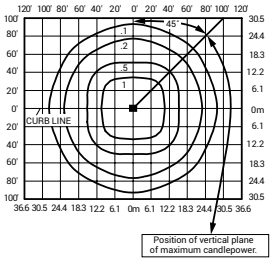
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
A	8,716	B3 U0 G3	10,320	B4 U0 G3	10,473	B4 U0 G3
J	13,075	B4 U0 G4	15,480	B4 U0 G4	15,710	B4 U0 G4

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

5SH



RESTL Test Report #: PL03501-001
OSQ-A-**-5SH-S-40K-UL
Initial Delivered Lumens: 21,066



OSQ-A-**-5SH-A-40K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 15,817
Initial FC at grade

Type V Short Distribution

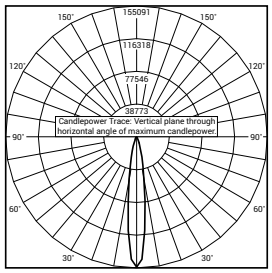
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11	Initial Delivered Lumens*	BUG Ratings** Per TM 15 11
A	8,906	B3 U0 G3	10,544	B4 U0 G3	10,701	B4 U0 G3
J	13,359	B4 U0 G3	15,817	B4 U0 G4	16,052	B4 U0 G4

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

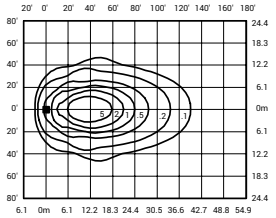
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

15D



RESTL Test Report #: PL03903-001
OSQ-A-**-15D-S-40K-UL
Initial Delivered Lumens: 22,600

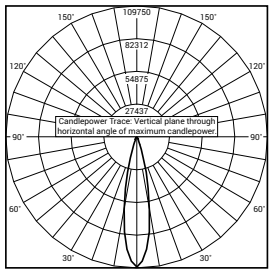


OSQ-A-**-15D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60˚ Tilt
Initial Delivered Lumens: 16,153
Initial FC at grade

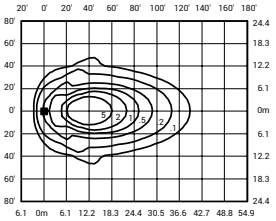
15˚ Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,095	10,769	10,929
J	13,643	16,153	16,393

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

25D



RESTL Test Report #: PL03903-002
OSQ-A-**-25D-S-40K-UL
Initial Delivered Lumens: 22,633

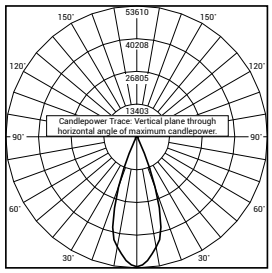


OSQ-A-**-25D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60˚ Tilt
Initial Delivered Lumens: 16,153
Initial FC at grade

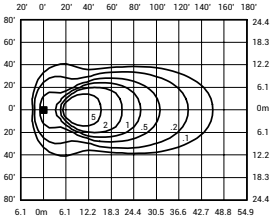
25˚ Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,095	10,769	10,929
J	13,643	16,153	16,393

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

40D



RESTL Test Report #: PL03903-003
OSQ-A-**-40D-S-40K-UL
Initial Delivered Lumens: 22,404



OSQ-A-**-40D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60˚ Tilt
Initial Delivered Lumens: 15,985
Initial FC at grade

40˚ Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,001	10,657	10,815
J	13,501	15,985	16,222

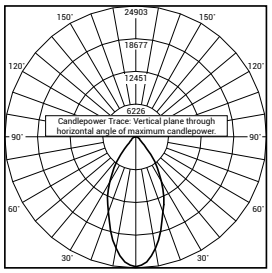
* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

OSQ™ LED Area/Flood Luminaire – Medium

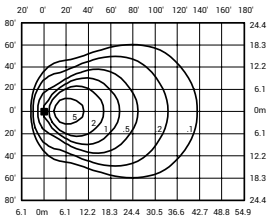
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Area/OSQ-Series

60D



RESTL Test Report #: PL03903-004
OSQ-A-**-60D-S-40K-UL
Initial Delivered Lumens: 22,301

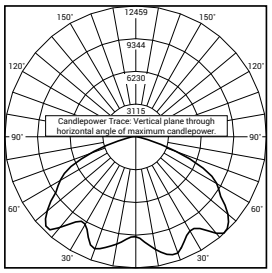


OSQ-A-**-60D-J-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60˚ Tilt
Initial Delivered Lumens: 16,153
Initial FC at grade

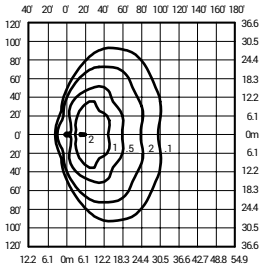
60˚ Flood Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	9,095	10,769	10,929
J	13,643	16,153	16,393

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

WSN



RESTL Test Report #: PL04597-001
OSQ-A-**-WSN-S-30K-UL
Initial Delivered Lumens: 19,087



OSQ-A-**-WSN-A-40K-UL
Mounting Height: 25' (7.6m) A.F.G., 60˚ Tilt
Initial Delivered Lumens: 10,555
Initial FC at grade

Wide Sign Distribution			
Input Power Designator	3000K	4000K	5700K
	Initial Delivered Lumens*	Initial Delivered Lumens*	Initial Delivered Lumens*
A	8,914	10,555	10,711
J	13,372	15,832	16,067

* Initial delivered lumens at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/-10%

Attachment 9. Roadway Fixture Specifications Sheet

XSP Series

XSP2™ LED Street/Area Luminaire – Double Module – Version C

Product Description

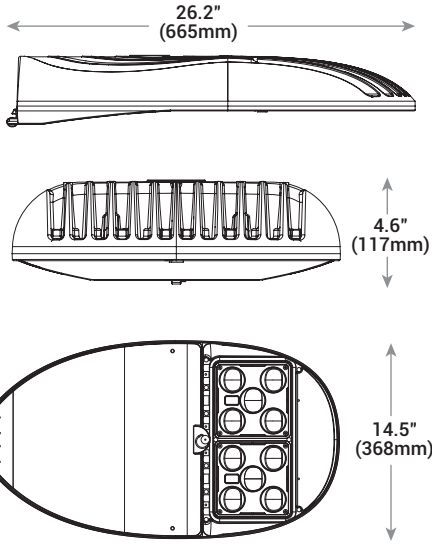
Designed from the ground up as a totally optimized LED street and area lighting system, the XSP Series delivers incredible efficiency without sacrificing application performance. Beyond substantial energy savings and reduced maintenance, Cree achieves greater optical control with our NanoOptic® Precision Delivery Grid™ optic when compared to traditional cobra head luminaires. The XSP Series is the better alternative for traditional street and area lighting with quick payback and improved performance.

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

Performance Summary

NanoOptic® Precision Delivery Grid™ optic
Made in the U.S.A. of U.S. and imported parts
CRI: Minimum 70 CRI (4000K & 5700K); 80 CRI (3000K)
CCT: 3000K (+/- 300K); 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	
Backlight Control Shield XA-SP2BLS - Provides 1/2 mounting height cutoff	**Bird Spikes** XA-SP2BRDSPK

Weight
24 lbs. (11kg)

Ordering Information

Example: BXSP-C-HT-2ME-F-30K-UL-SV

BXSP	C	HT		F				
Product	**Version**	**Mounting**	**Optic**	**Input Power Designator**	**CCT**	**Voltage**	**Color Options**	**Options**
BXSP	**C**	**HT** Horizontal Tenon	**2ME*** Type II Medium **2LG*** Type II Long **3ME*** Type III Medium **4ME*** Type IV Medium	**F** 139W	**30K** 3000K **40K** 4000K **57K** 5700K	**UL** Universal 120-277V **UH** Universal 347-480V	**BK** Black **BZ** Bronze **SV** Silver	**N** **Utility Label and NEMA® Photocell Receptacle** - External wattage label per ANSI C136.15 - 7-pin receptacle per ANSI C136.41 - Factory connected 0-10V dim leads - Photocell and shorting cap by others - Includes Q9 option - Refer to Field Adjustable Output spec sheet for details **Q9** **Field Adjustable Output** - Refer to Field Adjustable Output spec sheet for details **R** **NEMA® Photocell Receptacle** - 7-pin receptacle per ANSI C136.41 - Factory connected 0-10V dim leads - Photocell and shorting cap by others

* Available with Backlight Shield when ordered with field-installed accessory (see table above)
NOTE: Price adder may apply depending on configuration

Rev. Date: V5 10/12/2015

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

Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

XSP2™ LED Street/Area Luminaire – Double Module – Version C

Product Specifications

CONSTRUCTION & MATERIALS

- Die cast aluminum housing
- Tool-less entry
- Mounts on 1.25" (32mm) IP, 1.66" (42mm) O.D. or 2" (51mm) 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)
- Luminaire secured with two mounting bolts standard
- 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. Black, bronze and silver are available
- **Weight:** 24 lbs. (11kg)

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 1 driver
- Integral 10kV surge suppression protection standard
- To address inrush current, slow blow fuse or type C/D breaker should be used
- **10V Source Current:** 0.15mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Certified to ANSI C136.31-2001, 3G 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 ARRA
- DLC qualified. Exceptions apply when N or Q9 (select adjustments) options are ordered. Please refer to www.designlights.org/QPL for most current information
- RoHS compliant. Consult factory for additional details
- Dark Sky Friendly, IDA Approved. Please refer to www.darksky.org for most current information

Electrical Data*

Input Power Designator	System Watts 120-277V	System Watts 347-480V	Total Current					
			120V	208V	240V	277V	347V	480V
F	139	135	1.22	0.68	0.59	0.52	0.40	0.29

* Electrical data at 25˚C (77˚F). Actual wattage may differ by +/- 10% when operating between 120-480V +/- 10%

Recommended XSP Series Version C Luminaire Lumen Maintenance Factors (LMF)[1]

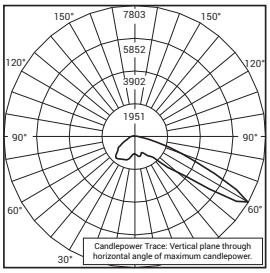
Ambient	Input Power Designator	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Calculated[3] LMF	100K hr Calculated[3] LMF
5˚C (41˚F)	F	1.04	0.97	0.91	0.85	0.79
10˚C (50˚F)	F	1.03	0.96	0.90	0.84	0.79
15˚C (59˚F)	F	1.02	0.95	0.89	0.83	0.78
20˚C (68˚F)	F	1.01	0.94	0.88	0.82	0.77
25˚C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

[1] Lumen maintenance values at 4000K and 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 time durations that are within 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)
[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)

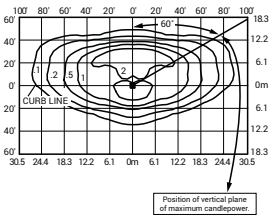
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Streetlights/XSP-Series-Streetlight

2ME



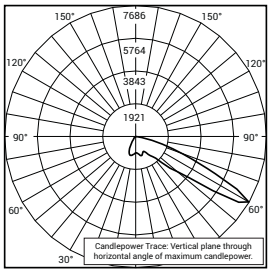
RESTL Test Report #: PL06675-001
BXSP-C-**-2ME-E-40K-UL
Initial Delivered Lumens: 8,850



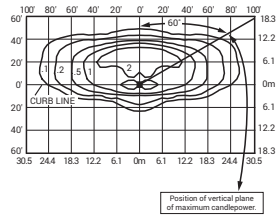
BXSP-C-**-2ME-F-30K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 11,256
Initial FC at grade

Type II Medium Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	11,256	B2 U0 G2	13,732	B2 U0 G2	14,408	B3 U0-G2

* Initial delivered lumens at 25˚C (77˚F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



RESTL Test Report #: PL06675-002
BXSP-C-**-2ME-E-40K-UL w/XA-SP1BLS
Initial Delivered Lumens: 7,078

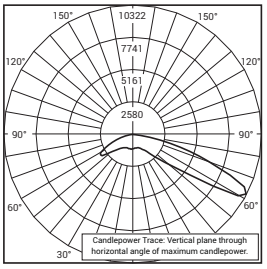


BXSP-C-**-2ME-F-30K-UL w/XA-SP2BLS
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 9,543
Initial FC at grade

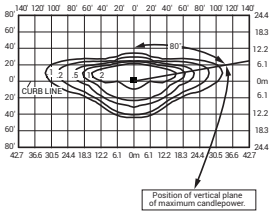
Type II Medium w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	9,543	B1 U0 G2	11,643	B2 U0 G2	12,215	B2 U0 G2

* Initial delivered lumens at 25˚C (77˚F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

2LG



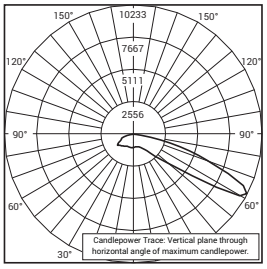
CESTL Test Report #: PL04154-001
BXSP-C-**-2LG-E-30K-UL
Initial Delivered Lumens: 6,944



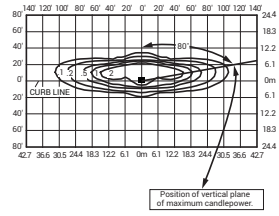
BXSP-C-**-2LG-F-30K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 11,134
Initial FC at grade

Type II Long Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	11,134	B2 U0 G2	13,583	B3 U0 G3	14,251	B3 U0 G3

* Initial delivered lumens at 25˚C (77˚F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



CESTL Test Report #: PL04155-001
BXSP-C-**-2LG-E-30K-UL w/XA-SP1BLS
Initial Delivered Lumens: 5,302



BXSP-C-**-2LG-F-30K-UL w/XA-SP2BLS
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 8,197
Initial FC at grade

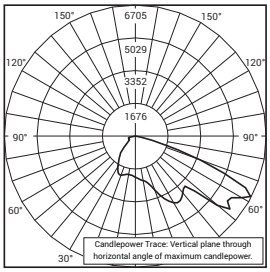
Type II Long w/BLS Distribution						
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	8,197	B1 U0 G2	10,001	B2 U0 G2	10,493	B2 U0 G2

* Initial delivered lumens at 25˚C (77˚F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

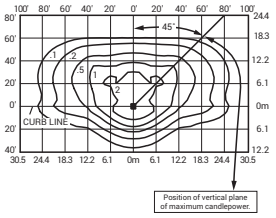
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Streetlights/XSP-Series-Streetlight

3ME



CESTL Test Report #: PL04093-001
BXSP-C-**-3ME-F-30K-UL
Initial Delivered Lumens: 10,671

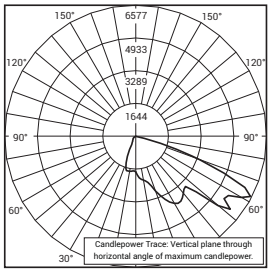


BXSP-C-**-3ME-F-30K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 11,011
Initial FC at grade

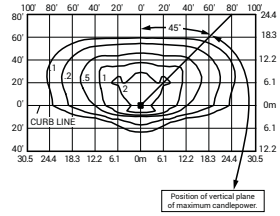
Type III Medium Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	11,011	B2 U0 G2	13,434	B3 U0 G2	14,095	B3 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



CESTL Test Report #: PL04094-001
BXSP-C-**-3ME-F-30K-UL w/XA-SP2BLS
Initial Delivered Lumens: 9,009



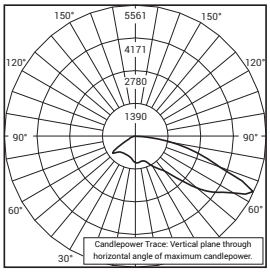
BXSP-C-**-3ME-F-30K-UL w/XA-SP2BLS
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 9,176
Initial FC at grade

Type III Medium w/BLS Distribution

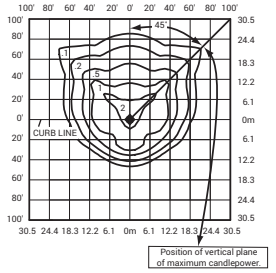
Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	9,176	B2 U0 G2	11,195	B2 U0 G2	11,746	B2 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

4ME



CESTL Test Report #: PL04091-001
BXSP-C-**-4ME-E-30K-UL
Initial Delivered Lumens: 6,923

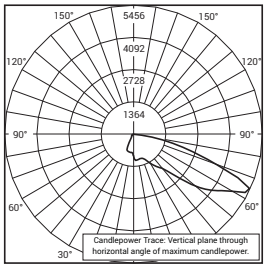


BXSP-C-**-4ME-F-30K-UL
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 11,134
Initial FC at grade

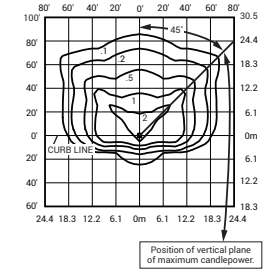
Type IV Medium Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	11,134	B2 U0 G2	13,583	B3 U0 G3	14,251	B3 U0 G3

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt



CESTL Test Report #: PL04092-001
BXSP-C-**-4ME-E-30K-UL w/XA-SP1BLS
Initial Delivered Lumens: 5,530



BXSP-C-**-4ME-F-30K-UL w/XA-SP2BLS
Mounting Height: 25' (7.6m) A.F.G.
Initial Delivered Lumens: 8,687
Initial FC at grade

Type IV Medium w/BLS Distribution

Input Power Designator	3000K		4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
F	8,687	B1 U0 G2	10,598	B2 U0 G2	11,119	B2 U0 G2

* Initial delivered lumens at 25°C (77°F). Actual production yield may vary between -10 and +10% of initial delivered lumens
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit:
www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf. Valid with no tilt

Attachment 10. Wall Pack Fixture Specifications Sheet

XSP Series

XSPW™ LED Wall Mount Luminaire

Product Description

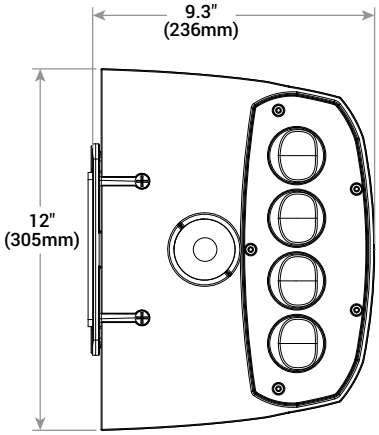
The XSPW™ LED wall mount luminaire has a slim, low profile design intended for outdoor wall mounted applications. The rugged lightweight aluminum housing and mounting box are designed for installation over standard single gang J-Boxes and mud ring single gang J-Boxes. The luminaire allows for through-wired or conduit entry from the top, bottom, sides and rear. The housing design is intended specifically for LED technology including a weathertight LED driver compartment and thermal management. Optic design features industry-leading NanoOptic® Precision Delivery Grid™ system in multiple distributions.

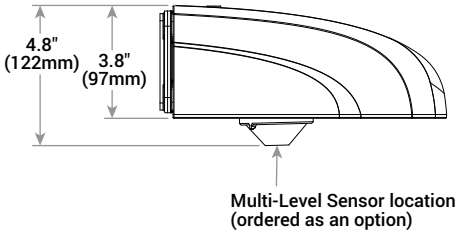
Applications: General area and security lighting

Performance Summary

- NanoOptic® Precision Delivery Grid™ optic
- Made in the U.S.A. of U.S. and imported parts
- **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





Multi-Level Sensor location
(ordered as an option)

Accessories

Field-Installed
Beauty Plate WM-PLT12** - 12" (305mm) Square WM-PMT14** - 14" (356mm) Square - Covers holes left by incumbent wall packs

** Must specify color

Weight
9.5 lbs. (4.3kg)

Ordering Information

Example: XSPW-A-0-2-F-C-U-Z

XSPW	A	0						
Product	**Version**	**Mounting**	**Optic**	**Modules**	**Input Power Designator**	**Voltage**	**Color Options**	**Options**
XSPW	**A**	**0** Wall	**2** Type II Medium **3** Type III Medium	**F** 4000K **M** 5700K	**C** 42W **G** 25W	**U** Universal 120-277V **1** 120V **2** 208-277V **6*** 347V	**S** Silver **T** Black **W** White **Z** Bronze	**K** **Multi-Level** - Refer to ML spec sheet for details - Available with Input Power Designator C only **P** **Photocell** - Not available with K option - Must specify 1, 2, or 6 voltage **Y** **0-10V Dimming** - Control by others - Available with Input Power Designator C only - Refer to dimming spec sheet for details

* Available in Canada only
NOTE: Price adder may apply depending on configuration

US: www.cree.com/lighting T (800) 236-6800 F (262) 504-5415
Canada: www.cree.com/canada T (800) 473-1234 F (800) 890-7507

XSPW™ LED Wall Mount Luminaire

Product Specifications

CONSTRUCTION & MATERIALS

- Slim, low profile design
- Luminaire housing specifically designed for LED applications with advanced LED thermal management and driver
- Luminaire mounting box designed for installation over standard single gang J-Boxes and mud ring single gang J-Boxes
- Luminaire can also be direct mounted to a wall and surface wired
- Secures to wall with four 3/16" (5mm) screws (by others)
- Conduit entry from top, bottom, sides, and rear
- Designed and UL approved for easy through-wiring
- Designed for downlight applications only
- 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, white and bronze are available
- **Weight:** 9.5lbs. (4.3kg)

ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347V, 50/60Hz, Class 2 driver
- **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
- **10V Source Current:** 0.15 mA

REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529
- DLC qualified. Please refer to www.designlights.org/QPL for most current information
- 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 ARRA
- RoHS compliant. Consult factory for additional details

Electrical Data*

Input Power Designator	System Watts 120-277V	System Watts 347V	Total Current				
			120V	208V	240V	277V	347V
C	42	46	0.36	0.21	0.19	0.16	0.14
G	25	27	0.22	0.13	0.11	0.10	0.08

* Electrical data at 25˚C (77˚F)

Recommended XSPW Series Lumen Maintenance Factors (LMF)[1]

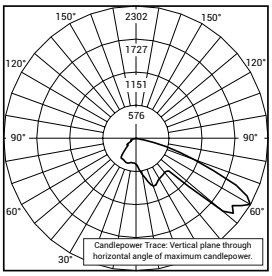
Ambient	Input Power Designator	Initial LMF	25K hr Projected[2] LMF	50K hr Projected[2] LMF	75K hr Projected[2] LMF	100K hr Calculated[3] LMF
5˚C (41˚F)	C	1.04	1.02	1.01	1.00	1.00
	G					
10˚C (50˚F)	C	1.03	1.01	1.00	0.99	0.99
	G					
15˚C (59˚F)	C	1.02	1.00	0.99	0.98	0.98
	G					
20˚C (68˚F)	C	1.01	0.99	0.98	0.97	0.97
	G					
25˚C (77˚F)	C	1.00	0.98	0.97	0.96	0.96
	G					

[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 time durations that are within 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)
[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)

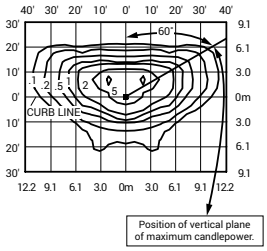
Photometry

All published luminaire photometric testing performed to IESNA LM-79-08 standards by a NVLAP accredited laboratory. To obtain an IES file specific to your project consult: www.cree.com/Lighting/Products/Outdoor/Wall-Mount/XSP-Series

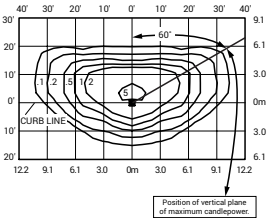
2



CESTL Test Report #: 2014-0017
BXSPW-A-*-2-F-G-U-S
Initial Delivered Lumens: 2,739



BXSPW-A-*-2-F-C-U-S
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 3,819
Initial FC at grade

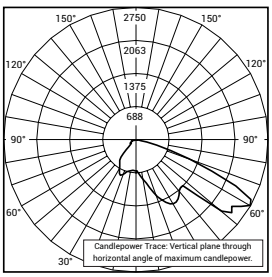


BXSPW-A-*-2-F-G-U-S
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 2,529
Initial FC at grade

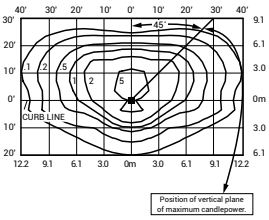
Type II Medium Distribution				
Input Power Designator	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
C	3,819	B1 U0 G1	4,109	B1 U0 G1
G	2,529	B1 U0 G1	2,722	B1 U0 G1

* Initial delivered lumens at 25˚C (77˚F)
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf.

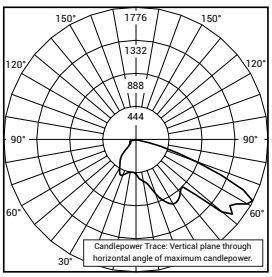
3



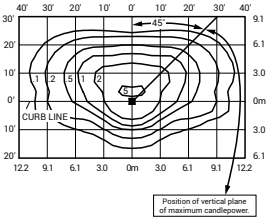
CESTL Test Report #: 2014-0018
BXSPW-A-*-3-F-C-U-S
Initial Delivered Lumens: 4,187



BXSPW-A-*-3-F-C-U-S
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 3,819
Initial FC at grade



CESTL Test Report #: 2014-0019
BXSPW-A-*-3-F-G-U-S
Initial Delivered Lumens: 2,692



BXSPW-A-*-3-F-G-U-S
Mounting Height: 10' (3.0m) A.F.G.
Initial Delivered Lumens: 2,529
Initial FC at grade

Type III Medium Distribution				
Input Power Designator	4000K		5700K	
	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11	Initial Delivered Lumens*	BUG Ratings** Per TM-15-11
C	3,819	B1 U0 G1	4,109	B1 U0 G1
G	2,529	B1 U0 G1	2,722	B1 U0 G1

* Initial delivered lumens at 25˚C (77˚F)
** For more information on the IES BUG (Backlight-Uplight-Glare) Rating visit: www.ies.org/PDF/Erratas/TM-15-11BugRatingsAddendum.pdf.