Canaveral Port Authority Exterior Light Management Plan

Revised 2018

MAN-2018-001-ENV-3

Canaveral Port Authority

Exterior Light Management Plan (ELMP)

APPROVALS

Revised 2018

Approved by U.S. Fish and Wildlife Service:

7/30/18

Approved by Florida Fish and Wildlife Conservation Commission:

7/27/18

Approved by the Canaveral Port Authority Board of Commissioners:

08/29/18

08/29/18

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1.PURPOSE

(1) The Canaveral Port Authority's Light Management Plan provides its tenants with a set of requirements to provide compliance with Federal, State, and multiple Port and industry requirements. The purpose of the LMP is to provide appropriate lighting quality and quantity for various CPA activities while:

a. Avoiding and minimizing impacts to the environment to prevent the adverse effects to nesting and hatchling marine turtles,
b. Optimizing lighting efficiencies,
c. Maintaining compliance with security and safety measures, and
d. Minimizing electric power consumption and operating costs.

(2) To meet this purpose the LMP specifically targets reduction of light pollution, sky glow and glare from exterior artificial light sources.

(3) General Objectives and Goals:

a. The lighting design shall consider all the following objectives:
    i) Environmental:
        (1) Exterior lights are extinguished when not required
        (2) When exterior lighting is required there shall be:
            (a) No direct lighting of the beach (light sources are not visible from the beach),
            (b) Unless noted otherwise, all exterior lighting is "turtle friendly."
            (c) To help reduce and prevent sky glow:
                (i) light fixtures shall be Full Cutoff,
                (ii) light sources shall be mounted as low to the ground as practicable, while meeting the facility's functional requirements.
    ii) Energy Efficiency:
        (1) Lights are extinguished when not required,
        (2) Light fixture selection and layout is designed to illuminate the required area, and minimize light trespass and wasted energy,
        (3) New (and proven) technologies are encouraged (unitized solar/battery lighting,

LED sources, networked sensors for multi-level lighting, etc.)

(4) Lighting design alternatives are evaluated using Life Cycle Cost Assessment (LCCA) to provide the most economical lighting design solution considering future maintenance and energy costs.

(5) Lighting Power Density (LPD) levels do not exceed the levels listed in the Florida Energy Conservation Code section C405.5 (current edition of the Florida Building Code).

iii) Security: Lighting must comply with the Department of Homeland Security and associated departments' (US Coast Guard, Customs and Border Patrol) issued regulations. Adequate level and quality of light for video surveillance needs to be provided in order to ensure the proper function of video cameras.

iv) Operations and Safety: Comply with the most restrictive criteria of the latest adopted editions of the Florida Building Code (currently 2017, 6th edition), IESNA (currently 10th edition) and OSHA.

(1) Lighting levels shall not be below the minimum level necessary for the task (as defined by IESNA).

v) Maintenance: Fixtures/materials shall be rated for harsh coastal environments; poles should be grounded (use of ground rod at each pole). CPA-maintained facilities shall utilize lamps and ballasts that are already in compliance with this LMP and already in use on CPA property (as this reduces the number of lamp types and ballasts CPA Facilities need to keep in stock). Height should be limited as much as possible to minimize equipment and manpower required for servicing light fixtures.

2. FACILITY LIGHT MANAGEMENT PLANS & CPA BUILDING DEPARTMENT PERMIT REQUIREMENTS

2.1. *The following information pertains only to the CPA building permit requirements as it relates to exterior site lighting. The CPA Building Department is required to review all new construction and renovation projects that occur on CPA property for compliance with the Florida Building Code in accordance with state law. Any project that includes the addition, relocation or change of light fixtures shall require a submission of drawings and a Facility Light Management Plan to the Building Department for review by the responsible governing agency. Refer to the Florida Building Code section 107 for specific requirements of permit drawings. In general, the exterior lighting portion of a permit submission shall include the following information:*

(1) Site photometric plans signed and sealed by a Professional Engineer licensed in the state of Florida. The photometric plans shall include:

a. Lighting summary table showing average, maximum and minimum foot candle level, as well as maximum/minimum and average/minimum ratios for each facility operational area. Provide an IESNA recommended light level compliance table with minimum foot candle, average foot candle, maximum/minimum and/or average/minimum ratio as applicable to demonstrate compliance. Site plan shall also indicate the distance from the beach.

b. Cut sheets of the intended fixtures and lamps for use, the same fixtures that were used in the computer model analysis which developed the site photometric plans. Cut sheets shall be marked to indicate the specified options included. In exterior lighting designs where there are numerous fixtures and lamps, inclusion of these material cut sheets as an 8.5" x 11" package with the Facility Light Management Plan will be acceptable as opposed to adding numerous construction drawing sheets to the permit submittal. For any lighting that is intended to be "turtle friendly," the lighting designer must include documentation that the light fixture has been reviewed and approved by FWC (including the FWC certification number or approval letter).

c. Any light fixtures or light sources that are not "turtle friendly" need to be clearly identified on the plans. The Facility Light Management Plan (2.1(3)) must contain an

explanation of why these light fixtures/light sources are required. Proof via photometric calculations may be required to be submitted to show "turtle friendly" light fixtures and/or light sources do not comply with light level requirements set by IESNA, OSHA, NFPA, or other standard/regulation applicable to that portion of the design.

d. A table of calculated Lighting Power Densities, with applicable maximums provided in Florida Energy Conservation Code section C405.5 (current edition of the Florida Building Code), for all areas applicable to the site.

e. A light fixture schedule, containing at a minimum: fixture description, manufacturer and model number, mounting height, lamp type and quantity, lumen output, lamp wattage, fixture voltage and any shielding or special requirements.

f. For areas with multiple lighting levels due to operations, photometric plans will need to be submitted for every light level configuration.

(2) Drawings with lighting control diagrams, schematics and description narratives signed and sealed by a Professional Engineer licensed in the state of Florida.

(3) A Facility Light Management Plan (FLMP) with a narrative description of the Facility's operations (and a reference to the applicable IESNA facility operational type), light fixtures and lighting controls. If the facility includes more than one operational type, the FLMP must include a description and locational graphic of each operational area. This will be required to be submitted along with the permit drawings to the Building Department for review and approval. After approval, the CPA will retain a copy, and the Owner/Developer/Tenant will be required to keep a copy on the facility premises and provide instruction to all employees who will be responsible for maintaining/operating the lighting controls.

2.2. Should the fixture manufacturer/model etc. change after a Building Permit is issued, revised drawings with the new light fixture selection and calculations must be submitted to the Building Department before installation. Any related changes to the Facility Light Management Plan must also be resubmitted. Any redesign costs related to a permit resubmission due to this situation will be the responsibility of the Owner/Developer/Tenant.

2.3. As part of the construction completion closeout requirements, the exterior lighting design

shall be tested for compliance with the sequence of operations of the lighting controls described in the FLMP. Any corrections required will be made prior to a Certificate of Occupancy issue.

2.4. After construction is complete and the facility is in operation, the exterior lighting shall operate in compliance with the submitted and approved FLMP. Each facility permitted under this ELMP with a FLMP shall conduct an annual self-survey prior to the beginning of the sea turtle nesting season on March 1. Any light that is out of compliance with the facility FLMP must be brought into compliance as soon as practical. For any light that cannot be brought into compliance within six months, a justification and timeline for the completion of corrective actions must be submitted to CPA. Facilities found not to be operating their exterior lighting in compliance with their FLMP will be subject to CPA Regulation 2012-1 (Code Enforcement Policy).

In addition to the facility self-surveys, CPA Code enforcement will coordinate with U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission on selected surveys of areas to assess lighting compliance with facilities FLMPs (or code under which exterior lighting was originally permitted and approved). Violations discovered during these random surveys would be subject to CPA regulation 2012-1 (Code Enforcement Policy).

2.5. The CPA Board of Commissioners has established a regulation establishing code enforcement policies, Regulation No. 2012-1, which includes exterior light management as one of the areas subject to enforcement. To summarize this regulation with respect to exterior light management code enforcement, the CPA Chief Executive Officer (Port Director) is authorized to designate certain employees (by name or by title) as code enforcement officers (for example Chief Building Official, Director of Port Environmental, Chief Engineer, etc.). These code enforcement officers are charged with the authority to issue citations to person (or persons) found to be in violation of CPA codes or regulations. Any person served a citation may make corrective actions or go before a hearing for a disposition by a CPA Commission-appointed special magistrate. The result of a hearing may result in fines or liens against the property. Repeat violations can have more severe penalties. For more information reference Canaveral Port Authority Regulation No. 2012-1.

3. GEOGRAPHIC CONSIDERATIONS

Due to geographic location and distance from the beach, the potential for direct lighting impacts can vary from facility to facility within the port boundaries, although all facilities within the port have the potential to contribute to overall sky glow. Lighting requirements are determined by the purpose(s) of the facility as defined by the IESNA facility operational type(s); however, more stringent limitations are generally required as distance from the beach diminishes. The Owner/Developer/Tenant and Lighting Designer shall identify the geographic zone where the facility is located and shall identify the IESNA facility operational type(s) that will exist based on their facility's function and operations. Multiple IESNA facility operational types can exist on a single project; for example, personnel identification inspection and a parking lot may be part of one project. The applicable IESNA facility operational type(s) shall be listed on the permit drawings and in the Facility Light Management Plan. Should a proposed facility project not fall into any of these operational types, the Owner/Developer/Tenant and Lighting Designer shall meet with the CPA Building Department and other related CPA personnel (Directors of Port Engineering, Environmental, Real Estate, etc) to determine the appropriate operational type for the project. The resolution of this meeting will be either (a) determination that an existing operational type is appropriate for the proposed facility or (b) development of a new operational type and specification of the lighting requirements to be later incorporated into the CPA Exterior LMP. In the event of a conflict of interpretation, the CPA Building Department will make the final determination of the facility's operational type. This meeting and determination of operational type (if required) shall take place before proceeding beyond Schematic Design. Any design effort by the Owner/Developer/Tenant/Lighting Designer beyond Schematic Design without first obtaining this determination will be at the Owner/Developer/Tenant's risk. CPA is not responsible for any redesign fees or related expenses due to the CPA Building Department's determination of operational type.

3.1. Beach:

This is the area identified in red on the map in Appendix A, also referred to as Jetty Park. This

area is the closest to the beach and has the most potential for direct line-of-sight and sky glow impacts to sea turtle nesting areas.

3.2. Eastern Waterfront:

This is the area identified in green on the map in Appendix A. This is the area of land on the water front from (and including) Cruise Terminal 1 eastward to the border of the Beach Zone/Jetty Park. Due to its proximity to Jetty Park and Cape Canaveral Air Force Station beach area, this area has potential for direct line-of-sight and sky glow impacts to sea turtle nesting areas.

3.3. Areas Outside of the Beach and Eastern Waterfront:

This is the rest of Canaveral Port Authority property not identified as either Beach or Eastern Waterfront areas. This area is identified in blue on the map in Appendix A. Due to physical distance and natural obstacles (dunes) there is less potential for direct line-of-sight impacts to sea turtle nesting areas although sky glow impacts could still be an issue.

4. LIGHTING REQUIREMENTS

4.1. General Lighting Requirements for All Exterior Areas:

a. Fixtures: Every fixture shall be Full Cutoff (and shielded, if necessary to prevent the light from being directly visible from the beach). General area site lighting shall be "turtle friendly lighting" except where stated otherwise for specific operational, safety, or security requirements that are described in a Facility Light Management Plan and referenced to specific requirements set by IESNA, OSHA, NFPA, or other standards or regulations applicable to that portion of the design (see Section 2). Red or Red/Orange LED is not permitted for general area lighting (i.e., other "turtle friendly" lighting should be used, such as amber LED or LPS). Examples of acceptable fixture types can be found on the Florida Fish & Wildlife Conservation Commission Website (http://myfwc.com/conservation/you-conserve/lighting/certified). Support of all lighting fixtures shall comply with the Florida Building Code for wind velocities, exposure, and importance factor. All lighting fixtures shall be mounted as low to the ground as practicable; any fixtures mounted higher than 30 feet above adjacent grades shall be provided with a separate safety chain or cable suitable to support the fixture upon failure of its normal support connections. In addition, any light fixture with a direct line of sight to the beach will be required to meet the Beach guidelines (Section 4.3).

b. Calculations: Unless stated otherwise, minimum lighting levels indicated in these guidelines are based on IESNA Lighting Handbook recommended calculation methods for average horizontal values over a 10'x10' maximum area on the task surface (grade level) at the end of a 3-year operation. Lighting Designers are responsible to review the IESNA guidelines in addition to this document.

c. Design: In accordance with Environmental Objectives (Section 1.3.a.i.), the lighting design should keep fixtures as close to the ground as possible and practicable for the desired function of the fixture. Where property adjacent to the project has a similar operational function and pole site lighting that meets this LMP, matching the height of the pole site lighting fixtures on the adjacent properties may be acceptable. If the operational type of

two adjacent facilities differ, then the height requirements may differ (for example, in the instance of a cargo storage yard with high container stacks which require pole lighting above 50 feet, the adjacent public parking lot should have lower pole heights). At property/tenant boundaries abutting residential property, parks or the Beach zone the lighting levels shall not exceed 0.2-foot candles measured at the property line and artificial light shall not be visible from the beach. At property/tenant boundaries abutting all other types of property the maximum lighting level shall not exceed 1.0-foot candles measured at the property line. This shall be shown on the permit drawings. All lighting foot-candle measurements will be at grade level. Under no circumstances may exterior lighting exceed the Lighting Power Density levels set in ASHRAE 90.1 (2007).

d. Controls: Each facility shall have the ability to control all lighting for itself. In cases of shared operational areas or other such activities between multiple facilities, every effort should be made to allow for controls in each facility. If not possible to provide the additional lighting controls as described above, provisions for future controls shall be provided and described in the Facility Light Management Plan. An explanation of why the current project cannot accomplish the controls as stated above will be submitted with the Facility Light Management Plan to the Building Department.

    i) High Service Operational Lighting (that does not meet the requirements of "turtle friendly lighting"), shall have an automatic shutoff control device (clock/timer, motion, etc.) to prevent this lighting from being on when the operations are not occurring.

    ii) Facilities that use High Service Operational Lighting for higher levels of lighting during the operational hours beyond the minimum safety levels required during non-operational hours shall utilize automatic lighting controls during times of non-operational use that either:

        (1) dim one set of lights (such as LED) or

        (2) switch off groups of "turtle friendly lights" to reduce the lighting level or

        (3) switch off the High Service Operational and switch on "turtle friendly lighting."

    iii) These lighting controls can be a:

(1) programmed time clock (for operations that have set schedules, for example a retail business that closes at 10:00pm every night), or

(2) manual timer switches that turn the lights on for a set period of time, not to exceed a typical operation length, or

(3) motion sensors.

iv) Manual bypass switches to override-illuminate light fixtures may be included with the control system, provided their purpose is only to provide a back-up control point in the event of a control system failure and is not used for routine operations. Any override controls shall be identified and described on the permit drawings and Facility Light Management Plan.

v) All new exterior area lighting projects shall be provided with controls that have the capability for connection to a remote control system via internet. Coordinate the exact type of control connection with CPA Facilities Department during project design.

vi) The Port may, at the Owner/Tenant/Developer's discretion, assume responsibility for control of specific exterior lighting within tenant spaces to maintain conformance to the purpose of the LMP and may charge the tenant accordingly. The Port reserves the right to replace or extinguish by any means nonconforming lighting throughout the Port property at the expense of the applicable tenant.

4.2. Security:

Security areas are to be lit throughout the night. Many facilities will have an area (or areas) that serve a Security function. This includes area of personnel identification inspection, perimeter security fencing, building exteriors with a need for security lighting (such as doors or locations subject to break-ins) and secure entrances (vehicle inspection and ID inspection). All of these areas shall use turtle friendly light fixtures and meet the lighting level requirements of IESNA for the particular area.

a. At gatehouses, Compact Fluorescent Lamps (CFL) or LED fixtures may be used inside the gatehouse and provided with an occupancy sensor or manual switch to turn light off when the gatehouse is not in use. ID inspection areas may use any source with a CRI greater than 50 provided the fixture is mounted at the lowest possible height and controlled by timer or manual switch. If lighting is controlled by a manual switch, a sign shall be posted reminding the operator to turn off the light when the gatehouse or ID

inspection area is not in use. ID inspection and search area may have a maximum lighting level of 30 foot-candles.

b. Security for Video Surveillance: Coordination with CPA is required at the beginning of the design to determine if the facility is going to be under video surveillance and if so, the purpose of the video surveillance. If the purpose of video surveillance is detection of objects' movement, turtle friendly Lighting will be adequate. If the purpose of the video surveillance is detailed recognition (reading of vehicle/vessel labels, color rendition, and/or facial recognition), low levels of light with light sources having CRI levels greater than 50 may be required. These lights should be off whenever possible with the use of motion sensors. If suitable motion sensors are not available for the maritime environment (i.e. will corrode/fail quickly and need constant replacement), a second set of non-turtle friendly color lights would be required for the area under video surveillance. These lights shall be as low to the ground as practicable to meet the surveillance specification and shall be listed in the Facility Light Management Plan. Another option available is to use infra-red (IR) light in lieu of white light.

4.3. Beach:

Lighting of this zone shall be strictly limited and controlled but shall comply with minimum IESNA recommendations during hours of public use. All lighting shall utilize turtle friendly Lighting. Depending on the location and orientation of the light fixture, additional shielding on the light fixture may be required to prevent the light source from being directly visible from the beach. Light fixtures shall be controlled by photocell and motion sensor. Under no circumstances can any artificial light be directly visible from the beach.

a. All windows and glass doors visible from the beach will be tinted. Tinting will achieve an industry-approved, inside-to-outside light transmittance value of 45 percent or less. Tinting methodology and test data showing compliance shall be submitted with the design drawings to the CPA Building Department.

b. Lights located apart from structures: shielded turtle friendly lighting will be permitted upon review and approval by the Port Authority in areas of traffic or personnel congestion. These light fixtures shall be as low as possible. Follow the IESNA recommendations for Parks and Trails for minimum levels of lighting as appropriate to the specific site. A manual "off" mode shall be provided allowing extinguishing of all lighting sources at the discretion of CPA.

c. Additional information on acceptable beach lighting can be obtained from Florida Fish & Wildlife Conservation Commission (http://myfwc.com/conservation/you-conserve/lighting/).

4.4. Eastern Waterfront:

Lighting of this zone shall utilize turtle friendly lighting unless other lighting is needed for specific operational, safety, or security purposes. All general area site lighting shall be turtle friendly lighting. Depending on the location and orientation of light fixtures, additional shielding may be required to prevent a light source from being directly visible from the beach.

a. Lighting for operational needs such as ship line handling, loading, unloading, etc. shall have control mechanisms to ensure lighting is off when operations are concluded. Lighting needed for operational, safety, or security purposes does not have to be turtle friendly if the reasons for not being able to use turtle friendly Lighting are described in a Facility Light Management Plan and referenced to specific requirements set by IESNA, OSHA, NFPA, or other standards or regulations applicable to that portion of the design.
b. Exterior general lighting – lighting designed to be on all night – shall be turtle friendly.

4.5 Areas Outside of Beach and Eastern Waterfront:

Lighting of this zone shall utilize turtle friendly lighting unless other lighting is needed for specific operational, safety, or security purposes. Depending on the location and orientation of light fixtures, additional shielding may be required to prevent a light source from being directly visible from the beach.

a. Lighting for operational needs such as ship line handling, loading, unloading, etc. shall have control mechanisms to ensure lighting is off when operations are concluded. Lighting needed for operational, safety, or security purposes does not have to be turtle friendly if the reasons for not being able to use turtle friendly lighting are described in a Facility Light Management Plan and referenced to specific requirements set by IESNA, OSHA, NFPA, or other standards or regulations applicable to that portion of the design.
b. Exterior general lighting – lighting designed to be on all night – should be turtle friendly but does not have to be if the reasons for not being able to use turtle friendly lighting are described in a Facility Light Management Plan and the following conditions are met:
    i. The geographic distance of the project area from the Beach is such that the

Brevard County Marine Turtle Protection Ordinance would not apply,

ii. The lights are dimmable and controlled such that they are dimmed to the lowest possible level for minimum IESNA requirements when normal operations are concluded – on-site calibration of the controlled dimming will be required near the completion of the construction project. Use of motion sensing technology to raise the level of lighting when vehicles are present will be permitted.

iii. Reasonable engineering analysis—to show the proposed lighting will not significantly contribute to sky glow—is performed and submitted to the Building Department along with the Facility Light Management Plan (FLMP). For example:

(1) A site sectional view of the proposed lighting showing the light fixture's elevation above sea level and obstructions between the area and the beach (natural [non-vegetative] and constructed obstructions).

(2) Lighting photometric calculations showing there is no expected reflection of light from the ground that would be anticipated to significantly contribute to sky glow under normal atmospheric conditions.

(3) Where the above calculations may be insufficient or not applicable to the specific situation, a reasonable engineering analysis/study may be performed to show that the lighting design is not expected to contribute to sky glow.

4.6. Signage:

Advertising signage illumination shall be limited to the hours of operation of the business. To illuminate advertising signage beyond these hours will require a detailed explanation, and permission from CPA will be required. The sign must be mounted directly to the structure or ground mounted. The sign may be lit externally with turtle friendly lighting fixtures mounted to the top of the sign or above the sign.

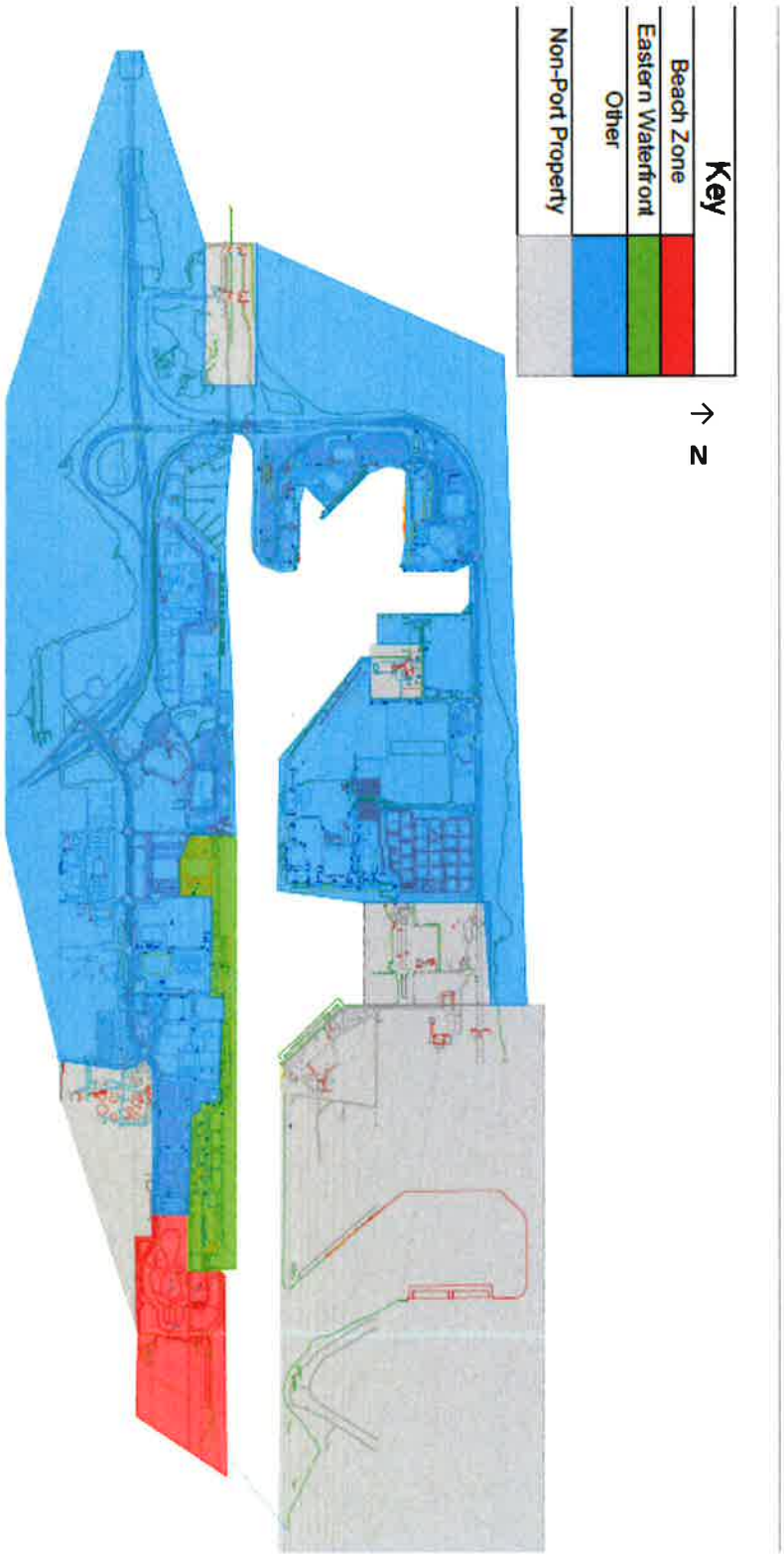
a. Internally lit LED signs shall:

i. Have an auto-sensor regulating its illumination to follow changes in ambient light.

ii. Be shielded at the top to reduce contribution to sky glow.

APPENDIX A

MAP OF THE PORT


Key
Beach Zone
Eastern Waterfront
Other
Non-Port Property
N

APPENDIX B

BACKGROUND

Port Canaveral is a deepwater seaport in Brevard County, Florida, serving the region as a vital resource of economic vitality for cruise, cargo, tenant businesses, and recreation. It also serves the federal agencies of United States, including the United States Coast Guard Station Port Canaveral, United States Coast Guard Marine Safety Detachment, United States Air Force and United States Navy. Canaveral Port Authority (CPA) property is located west of the U.S.A.F. property on the north side of the basin. On the south side of the inlet, CPA owns and manages Jetty Park, a 35-acre public recreational area with approximately 1,100 feet (0.2 miles) of beach. The CPA property extends west from Jetty Park inland to the Intercoastal Waterway channel in the Indian River Lagoon. Specific exterior lighting for safety and security at Port Canaveral support military, industrial, commercial and recreational uses at the harbor and adjacent upland properties.

In 2001, the US Fish and Wildlife Service issued a Biological Opinion to CPA documenting the existing exterior lighting conditions and the effect on local wildlife, specifically species of sea turtles. As part of exterior lighting improvement actions, CPA developed the first Exterior Light Management Plan (LMP) in 2001. Over the years, as new research has become available and operational needs have changed, the LMP has been modified. There was a major modification to the LMP in 2006 that resulted in a Light Management Plan, called the Exterior Light Management and Security Alternatives Plan (ELMSAP). This 2018 document now supersedes the 2006 ELMSAP and is effective for all new construction.

This LMP applies to all exterior lighting sources located on CPA property. The LMP does not apply to sources of light located on vessels or motorized vehicles or interior facility lighting not directly visible from the beach.

It is the Lighting Designer's responsibility to develop a design that meets all of the project's needs and all applicable regulations/standards. These regulations and standards are the following:

Authorities:

- Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)
- Florida Statute, Chapter 161.052 Coastal Construction and Excavation; regulation. (Enforced by FAC Chapter 62B-33 Bureau of Beaches and Coastal Systems – Rules and Procedures for Coastal Construction and Excavation; Permits for Construction Seaward of the Coastal Construction Control Line and Fifty-foot setback)

- Florida Statute, Chapter 161.163 Coastal areas used by sea turtles; rules. (Enforced by FAC Chapter 62B-55 Model Lighting Ordinance for Marine Turtle Protection)
- Florida Statute, Chapter 379.431 Protection of Marine Turtles
- 33 CFR 154.570 Facilities Transferring Oil or Hazardous Material in Bulk
- 33 CFR 126.15 Condition for Designation as Designated Waterfront Facility
- 29 CFR 1917.123 Terminal Facilities Illuminations
- 33 CFR 105.275 Security Measures for Monitoring
- Maritime Transportation Security Act (MTAS 2004)
- Florida Building Code (FBC) as adopted by the Florida Building Commission
- Operational Safety and Health Administration (OSHA)

Standards:

- Illuminating Engineering Society of North America: The IESNA Lighting Handbook, Tenth Edition
- Florida Marine Research Institute Technical Report TR-2: Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches, Third Edition, Revised 2003
- Brevard County Marine Turtle Protection Ordinance (Chapter 46, Article III).
- Navigation and Vessel Inspection Circular (NVIC) No. 11-02

APPENDIX C

DEFINITIONS AND ACRONYMS

1. **Adjacent grade(s)**: the elevation of the earth or water body that lies within 50 feet measured horizontally from the point of reference.
2. **Artificial light or artificial lighting**: the light emanating from any human-made device.
3. **Beach**: the zone of unconsolidated material that extends landward from the mean low water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation. For the purpose of this document, the "beach" is the area east of the Coastal Construction Control Line, or CCCL.
4. **Candela**: the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540 x 10^{12} Hz and that has a radiant intensity in that direction of 1/683 W/steridian.
5. **CFR**: Code of Federal Regulations
6. **CRI**: Color Rendering Index; a measurement index from 1-100 comparing a light sources' rendering of different colors when compared to natural light. CRI's closer to 100 replicate the color rendering of natural light.
7. **Coastal construction activities**: any work or activity that is likely to have a material effect on existing coastal conditions or natural shore and inlet processes.
8. **Directly illuminated**: illuminated as a result of glowing element(s), lamp(s), globe(s), or reflector(s) of an artificial light source which is visible to an observer on the beach.
9. **Directly visible**: for the purpose of this document, directly visible refers to a light source that can be seen (directly visible) from the beach.
10. **Exterior Light Management Plan (ELMP):** referring to this specific plan.
11. **Facility Light Management Plan (FLMP)**: a Light Management Plan specific to a particular facility or area. The Facility Light Management Plan contains detailed information regarding the lighting fixtures, light sources and lighting controls.
12. **Florida Fish and Wildlife Conservation Commission (FFWCC/FWC)**: designated state agency.
13. **Foot-candle**: the illuminance cast on a surface by a one-candela source one foot away.
14. **FSP**: Facility Security Plan.
15. **Full Cutoff**: a luminaire light distribution where zero candela intensity occurs at an angle of 90 degrees above nadir, and all greater angles from nadir. Additionally, the candela per 1000 lamp lumens does not numerically exceed 100 (10%) at an angle 80 degrees above nadir. This applies to all lateral angles around the luminaire.
16. **High Service Operational Lighting**: refers to light fixtures used to increase lighting levels only under active working conditions that may either:
    a. contain light sources other than those listed under "Turtle Friendly Lighting", or
    b. contribute to 'sky-glow' due to light reflection off the ground surface or the light fixture not being full cut-off

17. **HPS**: High Pressure Sodium
18. **IESNA**: Illuminating Engineering Society of North America
19. **Illuminance**: a measure of how much the incident light illuminates the surface.
20. **Indirectly illuminated**: illuminated as a result of the glowing element(s), lamp(s), globe(s), or reflector(s) of an artificial light source which is not visible to an observer on the beach.
21. **Indirectly visible**: for the purpose of this document, indirectly visible light refers to artificial light that is visible to an observer without the light source being directly visible.
22. **Lighting Level**: refers to the level of illumination or luminance measured on a plane. The plane shall be as applicable to the task but shall generally be vertical or horizontal to the earth.
23. **LPD**: Lighting Power Density is a measurement of Watts per square foot or linear foot.
24. **LPS**: Low Pressure Sodium
25. **Marine turtle**: any marine-dwelling reptile of the families Cheloniidae or Dermochelyidae found in Florida waters or using the beach as nesting habitat. For purposes of this document, marine turtle is synonymous with sea turtle and simply as turtle.
26. **Nadir**: the direction pointing directly below a particular location
27. **Nesting Season**: the period from March 1 through October 31 of each year.
28. **Nighttime**: the locally effective time period between sunset and sunrise, where sunset and sunrise times are as defined and tabulated by the U. S. Naval Observatory.
29. **Nits**: candelas per square meter.
30. **OSHA**: Operational Safety and Health Administration
31. **Photocell**: circuit elements that have many applications. A major application of photocells is in automatic lighting devices such as "dusk-to-dawn" lights. Photocells react to ambient light via changing electrical resistance.
32. **Sky glow**: the visible light seen over the horizon without directly seeing the artificial light source. Artificial lights contribute to sky glow by:
    a. not being Full Cutoff; i.e. lighting above the horizontal plane of the light,
    b. reflection of artificial light from the ground or a building surface
33. **Steridian**: the solid angle subtended at the center of a unit sphere by a unit area on its surface.
34. **Turtle Friendly Lighting**: light fixtures that consist of a combination of all the following:
    a. contain light sources considered 'minimally disruptive' to turtles which only emit wavelengths greater than 560 nanometers [Low Pressure Sodium, Amber, or Orange LED and true red neon (note: Red or Red/Orange LED are not permitted for area lighting)], and
    b. produce the lowest lumens necessary for the needed purpose, and
    c. meet or exceed 'full cutoff' as defined by IESNA, and
    d. do not contribute to "sky glow" by causing unnecessary reflection off the ground, wall surfaces, and/or other structures or objects, or having a light source that is too bright for the mounting height and/or having the light intensity directly downward (creating a "hot spot" directly beneath the fixture), and
    e. light sources shall be either certified or reviewed and approved by FWC. Contact FWC for further details on the review/approval or certification process:

http://myfwc.com/conservation/you-conserve/lighting/certification/

35. **Twilight**: times when the natural ambient exterior lighting level at grade is between 0.3 foot-candles and 30 foot-candles.
36. **U.S. Fish and Wildlife Service (USFWS/FWS)**: designated federal agency.

APPENDIX D

FACILITY LIGHT MANAGEMENT PLAN SAMPLE FORM

(For assistance contact CPA Building Department Official at 321-783-7831, ext. 299)

(For specific environmental questions regarding the ELMP contact the CPA Environmental Director at 321-783-7831, ext. 256)

Canaveral Port Authority

FOR-2018-001-ENV-3

FACILITY LIGHT MANAGEMENT PLAN SAMPLE FORM

Facility Name:_____ Date of Application:_____

Facility Address:_____

Please refer to the Canaveral Port Authority Exterior Light Management Plan (ELMP) for general information and requirements regarding light management and specific details on information that must be provided as part of this light management plan and/or the exterior lighting portion of the CPA building permit.

1. Facility operated by: _____ CPA _____ Tenant (check one)

2. Typical Operations Performed:

3. Typical Operating Hours:

4. Yes / No Are any lights being installed as a part of this project that do not meet the classification of 'turtle friendly' as defined in the ELMP? If YES, list them, describe their location and method of control, and describe the functional requirement for these lights. Describe the reasons for not being able to use turtle friendly lighting and include reference to specific requirements set by IESNA, OSHA, NFPA, or other applicable standards or regulations. Describe how the lighting design will not light the beach or contribute to sky glow. Attach extra pages if necessary.

5. Y / N Is the Facility, or portions of the Facility, subject to video surveillance? If YES please describe area and reason/purpose for surveillance:

6. Y / N Is overnight parking anticipated, or expected as a nature of your facility operations?

7. Please list the IESNA facility operational type(s) that will exist based on their function and operations and the areas they cover. If multiple operational types occur at this location, attach an 8.5" x 11" or 11" x 17" drawing with the various facility types areas marked for clarity. Attach extra pages if necessary.

8. Describe the lighting controls, with emphasis on how lighting is minimized during nighttime non-operational and daytime hours. Attach extra pages if necessary.

9. By initialing below you acknowledge that the facility will have:

_____ No light fixtures with a direct line of sight to the beach

_____ No uplights or any lights that are not full cut-off as defined by IESNA

Submitted by:

Name:

Mailing Address:

Telephone and email: