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CHAPTER 3
ENVIRONMENTAL AND RESOURCE PROTECTION

3.00.00 GENERALLY

3.00.01 Purpose and Intent

The purpose of this chapter is to safeguard the public health, safety, and welfare by ensuring the long-term protection and preservation of environmentally sensitive natural resource systems. Application of the provisions of this chapter shall result in development that reduces the potential for adverse impacts on the hydrologic functions of wetlands, natural systems, habitats, water quality, shorelines, marine life, and coastal resources.

3.00.02 Applicability

All new development and redevelopment shall be designed to ensure protection of areas designated as floodplains, environmentally sensitive lands, wetlands, or wellfields. No permit for development shall be issued by the City that is not in full compliance with the provisions of this chapter and the technical manuals listed in 1.06.00 (C).

3.01.00 FLOODPLAIN MANAGEMENT

3.01.01 Generally

A. The purpose of this section is to provide for adequate minimum standards and procedures for the construction of new residential and nonresidential structures, and for structures that are substantially improved, so that those structures can be eligible for insurance under the federal flood insurance program and so that the construction of those structures will be in conformity with recognized construction techniques designed to offer flood protection.
B. The degree of flood protection required in this chapter is considered reasonable for regulatory purposes and is based on scientific studies. Larger floods may occur. This chapter shall not be deemed to imply that areas inside or outside designated flood hazard districts will be entirely free from flooding or flood damages, and shall not create liability on the part of the City, or any officer or employee thereof, for any flood damages that result from good faith reliance on this chapter or any administrative decision lawfully made thereunder.
C. All references to property value or appraised property value shall mean only the appraised value established by the Nassau County Property Appraiser.

3.01.02 Basis for Establishing the Areas of Special Flood Hazard

The Flood Insurance Rate Map (FIRM) for the City, as may be amended, Community Panel Number 120172 0001 through 120172 0009; having the effective date of May 18, 1992, is incorporated into and made part of this LDC by reference.

3.01.03 Requirements for All Areas of Special Flood Hazard

In all areas of special flood hazard, the following provisions are required:

D. New construction or substantial improvements shall be securely anchored to prevent flotation, collapse, or lateral movement of the structure;
E. Manufactured homes shall be securely anchored to prevent flotation, collapse, or lateral movement in accordance with specifications of the National Flood Insurance Program regulations;
F. New construction or substantial improvements shall be constructed with materials and utility equipment resistant to flood damage;

G. New construction and substantial improvements shall be constructed by methods and practices that minimize flood damage;
H. Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities shall be designed and located so as to prevent water from entering or accumulating within the components during conditions of flooding;
I. New and replacement water supply systems shall be designed to eliminate infiltration of floodwaters into the systems;
J. New and replacement sanitary sewage systems shall be designed to eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters;
K. On-site waste disposal systems shall be located and constructed to avoid impairment to, or contamination from, them during flooding in accordance with rules or conditions established by the Florida DEP; and
L. Any alteration, repair, reconstruction, or improvement to a structure shall meet the requirements of new construction as contained in this section.
M. All buildings and structures shall be located landward of the mean high water line.

3.01.04 Requirements for Areas Where 100-Year Flood Elevation Levels Have Been Determined

In all areas of special flood hazard, where the flood elevation levels have been determined, the following provisions are required.

A. Within areas designated as Zone A1-A30:
   1. New construction of residential structures or substantial improvements (greater than thirty (30) percent of property value) of existing residential structures shall have the lowest floor of that structure, including basement, elevated to no lower than one (1) foot above the base flood elevation in areas where the base flood elevation has been determined and is numbered on the flood insurance rate map, or no lower than one (1) foot above the base flood elevation as determined by a Florida registered professional engineer in areas where the base flood elevation is undetermined or unnumbered on said maps. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate the unimpeded movements of floodwaters shall be provided.
   2. New construction of nonresidential structures or substantial improvements (greater than thirty percent (30%) of the appraised value of the property) made to existing nonresidential structures shall have the lowest floor, including basement, elevated, no lower than one (1) foot above the base flood elevation in areas where the base flood elevation has been determined and is numbered on the flood hazard boundary map, or no lower than one (1) foot above the base flood elevation as determined by a Florida registered professional engineer in areas where the base flood elevation is undetermined or unnumbered on said maps. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate the unimpeded movements of floodwaters shall be provided, or, together with attendant utility and sanitary facilities, shall be designed by a Florida registered professional engineer so that the area below the base flood level the structure is watertight, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

3. Where floodproofing is utilized for a particular structure, a Florida registered professional engineer shall certify that the floodproofing methods are reasonably adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with a 100-year flood.
4. All appliance and utility installations shall be located above the minimum flood elevation and are prohibited below the first floor.

B. Within areas designated as Zone AO:
   1. New construction and substantial improvements of residential structures shall have the lowest floor, including the basement, elevated above the highest adjacent grade or above the depth number specified on the City's FIRM, or at least two (2) feet if no depth number is specified.
   2. New construction and substantial improvements of nonresidential structures shall:
      a. Have the lowest floor, including the basement, elevated above the highest finished grade on each adjacent lot or above the depth number specified on the FIRM (at least two (2) feet if no depth number is specified); or
      b. Together with attendant utility and sanitary facilities, be completely flood proofed to or above the level specified in (2)(a) above, so that any space below that level is watertight, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

C. New construction or substantial improvements of elevated buildings that include fully enclosed areas formed by foundation and other exterior walls below the base flood elevation shall be designed to allow for the entry and exit of floodwaters to automatically equalize hydrostatic flood forces on exterior walls.
   1. Designs for complying with this requirement shall be certified by a Florida registered professional engineer and shall meet the following minimum criteria:
      a. A minimum of two (2) openings shall be provided having a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding;
      b. The bottom of all openings shall be no higher than one (1) foot above grade; and
      c. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided they permit the automatic flow of floodwaters in both directions.
   2. All proposed encroachments into the 100-year floodplain shall be permitted only through the City plans review process. Any permitted encroachment shall be offset with 1:1 ration of compensating storage volume to ensure that flood stages do not increase. Commercial or industrial developments may provide adequate floodproofing in lieu of elevating the finished floor pending that the flood proofing design alternatives meet all state and city codes and specifications, adhere to best professional practices, and are certified by an engineer and/or architect (as appropriate) registered in the State of Florida. Compensating storage for all floodwater displaced by development is to be accomplished between the normal high water of surface waterbodies (or seasonal high water table in groundwater applications) of the special flood hazard area and the 100-year flood elevation.

3. Electrical, plumbing, and other utility connections are prohibited below the base flood elevation.
4. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (i.e., garage doors) or limited storage of maintenance equipment used in connection with the premises (i.e., standard exterior doors) or entry to the living area (i.e., stairways or elevators).
5. The interior portion of such enclosed area shall not be partitioned or finished into separate rooms.

3.01.05 Requirements for Streams and other Floodprone Areas

Within areas of special flood hazard, where small streams exist but where no base flood data or floodways have been provided, or landlocked areas susceptible to flooding, the following provisions apply:

A. No encroachments, including fill material or structures, shall be located within the floodprone area unless a Florida registered professional engineer certifies that such encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
B. The base flood elevation shall be determined for the project area by means of an appropriate hydrologic/hydraulic analysis by a Florida registered professional engineer as part of the certification process.
C. The City may require the landowner to submit a letter of map revision (LOMR) to FEMA if the stream information is determined to be inadequate for construction permitting purposes.

3.02.00 ENVIRONMENTAL LANDS PROTECTION

3.02.01 Requirements Regarding Aquatic Preserve Protection

A. All new development and redevelopment within the boundaries of the Fort Clinch State Park Aquatic Preserve or abutting the boundaries of the Fort Clinch State Park shall be required to conform to the provisions of the Nassau River-St. Johns River Marshes and Fort Clinch State Park Aquatic Preserves Management Plan.
B. All new development, redevelopment, construction, dredging, or filling requires all applicable permits from State, federal, and regional agencies with jurisdiction over the Fort Clinch State Park Aquatic Preserve.

3.02.02 Requirements Regarding Coastal Areas and Shorelines

A. There is hereby established a Coastal Upland Protection Zone (CUPZ) which is an area extending 1,000 feet landward from the Coastal Construction Control Line (CCCL).
B. Except as expressly provided in this chapter, no development activity shall be undertaken in a coastal upland protection zone.
    1. Permitted activities within coastal upland protection zone are as follows:
        a. Single-family or two-family structures on a platted lot of record;
        b. All uses permitted by the underlying zoning classification and which have obtained all necessary and valid permits from State, federal, and local government agencies having permitting jurisdiction within the CUPZ;
        c. Conservation of soil, water, vegetation, fish, shellfish, and wildlife;
        d. Outdoor recreational activities, including bird watching, hiking, boating, fishing, trapping, horseback riding, and swimming;
        e. Commercial shell fishing and trapping;

f. Educational and scientific research;
g. Wilderness areas and wildlife preservation and refuges;
h. Minor maintenance or emergency repair to existing structures or improved areas; and
i. Properly designed and permitted walkovers.

2. Prohibited activities within the CUPZ are as follows:
   a. Any activities involving structures, grading, filling, dredging, vegetation removal, and flora and fauna which have not obtained all necessary and valid permits from State, federal, and local government agencies having permitting jurisdiction within the CUPZ;
3. Development shall not adversely affect contours and topography within the CUPZ. Adversely affect is herein defined as any activity which:
   a. Causes a measurable interference with the natural functioning of the dune structure;
   b. Results in removal or destruction of native vegetation which will either destabilize a significant dune or cause a significant deleterious impact to the dune system due to increased erosion by wind or water;
   c. Results in removal or disturbance of existing sandy soils of the dune system to such a degree that a significant deleterious impact to the dune system would result from either reducing the existing ability of the system to resist erosion during a storm or lowering existing levels of storm protection to upland properties and structures;
   d. Disturbs topography or vegetation such that the system becomes unstable, or suffers catastrophic failure; or
   e. Causes a significant impact to endangered species, species of special concern, or threatened species, or their habitats.
4. All development activity seaward of the coastal construction control line (CCCL) shall comply with all requirements of Section 3.02.02 (B) above and only where a Florida DEP permit has been issued for the specific activity.

3.02.03 Requirements Regarding Habitat Protection

A. A professionally prepared biological survey to document the presence of endangered, threatened, or species of special concern shall be submitted with applications for development when the development is:
   1. In excess of five (5) acres on previously undisturbed properties; or
   2. Located on environmentally sensitive lands.
B. Environmentally sensitive lands for which a survey is required include:
   1. All land identified as "Conservation" on the FLUM and on the adopted zoning map; and
   2. All undisturbed properties within 150 feet of Fort Clinch State Park Aquatic Preserve and all navigable tributaries.
C. Biological surveys shall:
   1. Follow the standards and criteria adopted by the Florida Fish and Wildlife Conservation Commission; or
   2. Include a preliminary report consisting of pedestrian surveys of 200-foot transects through a minimum of twenty-five percent (25%) of each habitat on site. Within twenty-one (21) days of the preliminary report, the City Manager shall (1) render a finding of whether a second, more intensive survey is needed, based on the information provided by the Florida Fish and Wildlife Conservation

Commission, and (2) shall describe the parameters it will follow for such an intensive survey, if required.

D. If the field biological inventory indicates the presence of endangered, threatened, or species of special concern:
   1. The survey shall be forwarded to the Florida Fish and Wildlife Conservation Commission; and
   2. The applicant shall follow the recommendations of the Florida Fish and Wildlife Conservation Commission for mitigating loss of habitat; or
   3. A habitat plan shall be prepared by a qualified ecologist, biologist, or other related professional and shall include, at a minimum, the following:
      a. An analysis of the likelihood of the species surviving on the proposed development site as a viable population, assuming that the proposed development would not occur and taking into account the quality and quantity of habitat needed to maintain members of the species;
      b. An analysis of existing viable habitat on adjacent property for the species;
      c. The land needs of the species that may be met on the development site; and
      d. Measures that shall be taken to protect the habitat of the species on the property, if the species would likely remain a viable population, in the absence of the proposed project.

E. Prohibited activities:
   1. No threatened species of wildlife or freshwater fish or their nests, eggs, young, homes, or dens, shall be taken, transported, stored, served, bought, sold, or possessed in any manner or quantity at any time, except as specifically permitted by the provisions of State law.
   2. No person shall kill, wound, pursue, molest, harm, harass, capture, or possess any threatened species or parts thereof or their nests, eggs, young, homes, or dens, except as authorized by specific permit, issued by the Florida DEP, the Florida Fish and Wildlife Conservation Commission, and any other applicable State or federal agency.

F. Development proposed adjacent to Outstanding Florida Waters, aquatic preserves, wildlife sanctuaries, wildlife refuges, state preserves, forests, parks, gardens, and wildlife management areas shall be environmentally compatible in order to conserve wildlife populations and habitat.

3.03.00 WETLAND PROTECTION

3.03.01 Applicability

The requirements of this section shall apply to all of the areas under the jurisdiction of the Florida DEP, the USACOE, and the SJRWMD, as well as those lands identified as "Conservation" on the FLUM and on the adopted zoning map. Exemptions to buffering requirements exist for resource-based recreational facilities such as trails, boardwalks, piers and boat ramps, and components of water-dependent commercial uses such as port facilities, marinas, fish camps, and commercial fishing operations.

3.03.02 Agency Coordination Required

All new development and redevelopment adjacent to jurisdictional wetlands shall be required to include coordination with the agencies with regulatory jurisdiction over wetlands, including the County, representatives of the Florida DEP, the USACOE, and the SJRWMD, for assistance and verification in identifying and delineating wetlands.

3.03.03 Development Within Wetlands

Except as expressly provided in this section, no development activity shall be permitted in a wetlands area, as described in Section 3.03.01.

A. Wetlands shall be preserved in their natural state. No fill shall be placed in a wetland, and the wetland shall not be altered.

B. Buffering requirements for development adjacent to wetlands or natural water bodies:

1. All new development and redevelopment adjacent to jurisdictional wetlands or surface water bodies shall be required to provide a buffer zone of native vegetation at least twenty-five (25) feet wide around wetlands and fifty (50) feet from natural water bodies to prevent erosion, retard runoff, and provide areas for habitat. All new construction that is a water dependent or water related use within the CRA and I-W zoning is exempt from Section 3.01.03(J) as well as the required buffers established by this Section; and

2. This setback shall be required for any development, except docks or piers which have received a permit from the Florida DEP, SJRWMD, or the USACOE.

C. Permitted activities within areas designated by the City, FDEP, SJRWMD, or the USACOE as wetlands protection zones:

1. Potentially allowable uses adjacent to wetlands protection zones are those uses included in the Conservation land use category on the FLUM;

2. Development is limited to buildings that are supportive of and accessory to the Conservation land use category, such as interpretative centers, rest rooms, or covered picnic pavilions;

3. Developing an area that no longer conforms to the determination of the SJRWMD as wetlands, except former wetlands that have been filled or altered in violation of any rule, regulation, statute, or this LDC. The developer shall demonstrate that the water regime has been permanently altered, either legally or naturally, in a manner so as to preclude the area from maintaining surface water or hydroperiodicity necessary to sustain wetlands structure and function. Adequate proof shall include statements from federal or State agencies having jurisdiction as well as technical evidence from registered hydraulics engineers or other certified experts;

4. Development of a wetlands stormwater discharge facility or treatment wetlands in accordance with State permits received under currently relevant sections of the *F.A.C.*; and

5. Boardwalks, piers, boathouses, boat shelters, fences, duck blinds, wildlife management shelters, footbridges, observation decks and shelters, and other similar water-related structures, provided that installation does not involve grading, fill, dredging, or draining, and provided that such structures are constructed on pilings so as to permit the unobstructed flow of water and light and preserve the natural contour of the wetlands. All pilings shall be driven into place; no jetting of pilings shall be allowed.

3.03.04 Design Requirements

A. All new development and redevelopment adjacent to jurisdictional wetlands shall be designed, constructed, maintained, and undertaken in a way that minimizes the adverse impacts on the functions of the affected environmentally sensitive zone.
B. In addition to any standards required by federal, State, or local agencies and any other section within this LDC, the following standards shall apply to uses found to be permissible in or adjacent to wetlands:
   1. The use shall allow the movement of aquatic life requiring shallow water;
   2. Existing flood channel capacity shall be maintained;
   3. Stable shoreline embankments shall be ensured on unstable shorelines where water depths are inadequate, to eliminate the need for offshore or foreshore channel construction dredging, maintenance dredging, spoil disposal, filling, beach feeding, and other river, lake, and channel maintenance activities;
   4. Uses in areas where there is inadequate water mixing and flushing shall be eliminated or stringently limited as provided in Section 3.03.00;
   5. Uses shall be prevented in areas which have been identified as hazardous due to high winds or flooding;
   6. Access roads, parking lots, and similar structures shall be limited to locations on properly zoned uplands;
   7. Any wetlands shown on the site plan to remain undisturbed that become damaged during construction shall be completely restored. Complete restoration means that the restored area shall function equivalently to the wetland prior to damage;
   8. Accessory uses shall be limited to those which are water dependent; and
   9. Fill shall not be placed in waters or wetlands to create usable land space.

3.04.00 WELLFIELD PROTECTION

3.04.01 Purpose and Intent

The purpose and intent of this section is to safeguard the public health, safety, and welfare by ensuring the protection of the principal source of water from potential contamination and to control development in and adjacent to designated wellheads and surrounding wellfield areas to protect water supplies from potential contamination.

3.04.02 Wellfield Protection Area

A. A wellfield protection area is hereby established to include all land within a 500-foot radius from a public potable water wellhead.
B. The following uses shall be prohibited within the wellfield protection area:
   1. All regulated industries by the Florida DEP as defined in Rule 62-521, *F.A.C.*;
   2. Activities that require the storage, use, or transportation of restricted substances, agricultural chemicals, hazardous toxic waste, medical waste, and petroleum products;
   3. Commercial animal facilities, including veterinarian clinics;
   4. Mines;
   5. Industrial land uses;
   6. Wastewater treatment plants;
   7. Commercial activities that involve the use of hazardous chemicals such as, but not limited to, dry cleaning operations, auto repair and servicing, pool supply, gas stations, junkyards, and machine shops;

8. Injection wells, irrigation wells, and domestic and commercial wells less than six (6) inches in diameter;
9. Stormwater facilities, including the use of drainage wells or sinkholes for stormwater disposal; and
10. Human or animal cemeteries.

3.05.00 OUTDOOR LIGHTING

3.05.01 Generally

A. It is the policy of the City to minimize the use of artificial light to illuminate the beaches. No artificial public or private light source shall directly illuminate areas seaward of the primary dune (called "beach areas") where it may deter adult female sea turtles from nesting or disorient hatchlings.
B. The following activities involving direct illumination of portions of the beach shall be prohibited on the beach at nighttime during the nesting season (May 1 to October 31 of each year) for the protection of nesting females, nests, and hatchling marine turtles:
   1. The operation of all motorized vehicles, except emergency and law enforcement vehicles or those permitted on the beach for marine turtle conservation or research; and
   2. The building of campfires or bonfires.

3.05.02 Outdoor Lighting in Beach Areas

A. The following standards shall be applicable to all new construction, reconstruction, or development activities:
   1. Controlled use, design, and positioning of lights:
      a. The use of lighting for decorative and accent purposes, such as that emanating from spotlights or floodlights, is prohibited.
      b. The use of lights for safety and security purposes shall be limited to the minimum number required to achieve their functional role. The use of motion detector switches that keep lights off except when approached and that switch lights on for the minimum duration possible is required.
      c. Fixture lights shall be designed and positioned so that they do not cause direct or indirect illumination of areas seaward of the primary dune.
      d. Wall-mounted fixtures, landscape lighting, and other sources of lighting shall be designed and positioned so that such light does not directly illuminate areas seaward of the primary dune, nor is directly visible from the beach.
      e. All lights on balconies shall be shielded from the beach.
      f. Lighting in parking lots within line of sight of the beach shall be positioned and shielded so that only deflected light may be visible from the ground level of the beach.
      g. The use of red, yellow, or orange lights is permitted where security or safety is a concern, shielding is impracticable, or visibility from the beach cannot be prevented.
      h. Exterior artificial light fixtures within direct line-of-sight of the beach shall include completely shielded downlight-only fixtures or recessed fixtures having low wattage (i.e. fifty (50) watts or less) "bug" type bulbs and nonreflective interior surfaces. Other fixtures that have appropriate shields, louvers, or cut-off features may also be used if they are in compliance with Section 3.05.02(A)(1)(a), (b), and (c) above;

i. Exterior artificial light fixtures within direct line-of-sight of the beach shall be mounted as low in elevation as possible through use of low-mounted wall fixtures, low bollards, and ground-level fixtures.

j. Only low intensity lighting shall be used in parking areas within line-of-sight of the beach. Such lighting shall be set on a base which raises the source of light no higher than forty-eight (48) inches off the ground and shall be positioned or shielded so that the light is cast downward, the source of light or any reflective surface of the light fixture is not visible from the beach, and the light does not directly or indirectly illuminate the beach.

k. Parking areas and roadways, including any paved or unpaved areas upon which motorized vehicles will park or operate, shall be designed and located to prevent vehicular headlights from directly or indirectly illuminating the beach.

l. Vehicular lighting, parking area lighting, and roadway lighting shall be shielded from the beach through the use of ground-level barriers. Ground level barriers shall not interfere with marine turtle nesting or hatchling emergence, or cause short- or long- term damage to the beach/dune system.

m. Tinted glass or film shall be installed on all windows and glass doors of single- or multi-story structures within line-of-sight of the beach. Use of appropriately shielded low-pressure sodium vapor lamps and fixtures shall be preferred for high-intensity lighting applications, such as lighting parking areas and roadways, providing security, and similar applications.

n. Temporary lighting of construction sites during the marine turtle nesting season shall be restricted to the minimal amount necessary and shall incorporate all of the standards of this section.

2. Lighting for pedestrian traffic

a. Beach access points, dune crossovers, beach walkways, piers or any other structure on or seaward of the primary dune designed for pedestrian traffic shall use the minimum amount of light necessary to ensure safety.

b. Pedestrian lighting shall be of low wattage and recessed or shielded so that only deflected light may be directly visible from the beach.

3. Prior to the issuance of a certificate of occupancy, compliance with the beachfront lighting standards as set out in this section shall be demonstrated as follows:

a. Upon completion of the construction activities, a registered Florida architect or Florida registered professional engineer shall conduct a site inspection, which includes a night survey with all the beachfront lighting turned on.

b. The inspector shall provide a written report of the inspection findings, identifying the date and time of the initial inspection, the extent of compliance with this section, all areas of potential and observed noncompliance with this section, any action taken to remedy observed noncompliance, if applicable, and the dates and times of remedial inspections, if applicable.

c. The inspector shall sign and seal the inspection report, which shall include a certification that the beachfront lighting has been constructed in substantial accordance with the terms of this section, the beachfront lighting does not illuminate areas seaward of the primary dune at the time of night inspection, and the beachfront light sources are positioned so that only deflected light may be visible from the beach at the time of the night inspection.

B. All public or private buildings and other improvements existing prior to July 18, 2000 shall comply with the following standards:

1. Existing artificial light sources that are essential for safety or security shall be repositioned, modified, or replaced with modern alternatives so that only deflected light may be visible at ground level from the beach, and light does not directly illuminate areas seaward of the primary dune.
2. Existing artificial light fixtures shall be repositioned, modified, or removed so that:
   a. The point source of light or any reflective surface of the light fixture is not directly visible from the beach;
   b. Areas seaward of the frontal dune are not directly or indirectly illuminated; and
   c. Areas seaward of the frontal dune are not cumulatively illuminated.
3. The following measures shall be taken to reduce or eliminate the negative effects of existing exterior artificial lighting:
   a. Reposition fixtures so that the point source of light or any reflective surface of the light fixture is no longer visible from the beach;
   b. Replace fixtures having an exposed light source with fixtures containing recessed light sources or shields;
   c. Replace traditional light bulbs with yellow "bug" type bulbs not exceeding fifty (50) watts;
   d. Replace non-directional fixtures with directional fixtures that point down and away from the beach;
   e. Replace fixtures having transparent or translucent coverings with fixtures having opaque shields covering an arc of at least 180 degrees and extending an appropriate distance below the bottom edge of the fixture on the seaward side so that the light source or any reflective surface of the light fixture is not visible from the beach;
   f. Replace pole lamps with low-profile, low-level luminaries so that the light source or any reflective surface of the light fixture is not visible from the beach;
   g. Replace incandescent, fluorescent, and high intensity lighting with the lowest wattage low pressure sodium vapor lighting possible for the specific application;
   h. Plant or improve vegetation buffers between the light source and the beach to screen light from the beach; and
   i. Construct a ground level barrier to shield light sources from the beach. Ground-level barriers shall not interfere with marine turtle nesting or hatchling emergence, or cause short- or long- term damage to the beach/dune system.
4. The following measures shall be taken to reduce or eliminate the negative effects of interior light emanating from doors and windows within line-of-sight of the beach:
   a. Apply window tint or film that meets the standards for tinted glass;
   b. Rearrange lamps and other moveable fixtures away from windows;
   c. Use window treatments (e.g., blinds, curtains) to shield interior lights from the beach; or
   d. Turn off unnecessary lights.
5. Light sources within line of sight of the beach that cannot be repositioned, modified, or replaced, for whatever reason, shall be turned off from sunset each night until sunrise each morning during the nesting season.