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MEMORANDUM

CRC-17-14

TO: Coastal Resources Commission

FROM: Frank Jennings, District Manager, Northeastern District
Division of Coastal Management

SUBJECT: CRC Dune Protection, Restoration and Repair

The oceanfront dunes provide protection from storms and are a vital part of the Ocean Hazard Area of Environmental Concern. One of the goals of the CAMA is to provide a management system capable of preserving and managing the natural ecological conditions of the barrier dune system (and the beaches) to safeguard and perpetuate their natural productivity.

For management purposes, your rules (15A NCAC 7H .0305) include definitions of various land forms associated with the Ocean Hazard Area including Ocean Beaches, Nearshore, Primary Dunes, and Frontal Dunes. Frontal Dunes are defined as the first mound of sand located landward of the ocean beach that has stable and natural vegetation present. Primary Dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. Primary Dunes extend landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the "dune trough").

If a Primary Dune exists in the AEC on or landward of the lot where the development is proposed the development is required to be landward of the crest of the primary dune, the ocean hazard setback, or development line, whichever is farthest from vegetation line, static vegetation line, or measurement line, whichever is applicable. For existing lots (platted by June 1, 1979), however, where setting the development landward of the crest of the primary dune would preclude any practical use of the lot, development may be located oceanward of the primary dune. In such cases, the development may be located landward of the ocean hazard setback but is not be located on or oceanward of a frontal dune or the development line. If no primary dune exists, but a frontal dune does exist in the AEC on or landward of the lot where the development is proposed, the development is to be set landward of the frontal dune, ocean hazard setback, or development line, whichever is farthest from the vegetation line, static vegetation line, or measurement line, whichever is applicable. If neither a primary nor frontal dune exists in the AEC on or landward of the lot where development is proposed, the structure is to sited landward of the ocean hazard setback or development line, whichever is more restrictive.

To avoid weakening the protective nature of Ocean Beaches and Primary and Frontal dunes, no development is permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon that would adversely affect the integrity of the dune. Other dunes within the ocean hazard area are not to be disturbed unless the development of the property is otherwise impracticable. Any disturbance of these other dunes is allowed only to the extent permitted by 15A NCAC 07H .0308(b).

Under 15A NCAC 07H .0308(b) for Dune Establishment and Stabilization, the creation or alteration of dunes is allowed so long as the following conditions are met:

- (1) Any new dunes established shall be aligned to the greatest extent possible with existing adjacent dune ridges and shall be of the same general configuration as adjacent natural dunes.
- (2) Existing primary and frontal dunes shall not, except for beach nourishment and emergency situations, be broadened or extended in an oceanward direction.
- (3) Adding to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The filled areas shall be immediately replanted or temporarily stabilized until planting can be successfully completed.
- (4) Sand used to establish or strengthen dunes shall be of the same general characteristics as the sand in the area in which it is to be placed.
- (5) No new dunes shall be created in inlet hazard areas.
- (6) Sand held in storage in any dune, other than the frontal or primary dune, may be redistributed within the AEC provided that it is not placed any farther oceanward than the crest of a primary dune or landward toe of a frontal dune.
- (7) No disturbance of a dune area shall be allowed when other techniques of construction can be utilized and alternative site locations exist to avoid unnecessary dune impacts.

Based on review of meeting minutes and CRC documents, the original intent of the CRC's dune rules (1981) was to address the practice of dune creation and set standards to require following natural dune alignment and configuration as much as possible, and also to avoid "steep pushed-up dikes" on the oceanfront. The Commission also intended to prevent the creation of artificial dunes out on the "storm beach" that would "not last very long" and create a false sense of security. The Commission intended to restrict the building of primary and frontal dunes on the beachfront. From reviewing the CRC meeting minutes and materials in the early days of the coastal program, it seems there was concern by the Commission that allowing the pushing of dunes out on the beach (past the frontal dune) would lead to an abuse of the setback rules and create a "false sense of permanence" particularly in inlet areas. The Commission also did not want other dunes within the AEC to be destroyed by being used as a sand supply for additional dunes.

In 1992, staff realized that strict application of the rules restricting the pushing of sand oceanward was impractical as some degree of this activity was "necessary to accommodate normal development of oceanfront lots" and some degree of land leveling should be allowed. To address these issues, the rule was amended to allow redistributing sand "held in storage" in other dunes within the AEC, but no farther oceanward than the crest of the primary dune or landward toe of the frontal dune.

More recently, Staff has noted shifting sand blown by hurricanes, tropical storms and northeasters has been covering decks, driveways, swimming pools, houses and buildings, both on the oceanfront as well as landward of the oceanfront area. Property owners are at times conflicted with current rules in trying to maintain their properties by removing storm driven sand.

Additionally, property owners are looking for ways to enhance the barrier dune system while being able to utilize and enjoy their property including the redistribution of sand on individual lots.

At our upcoming meeting in Manteo, I will review your current rules on dune protection, restoration and repair as well as present examples of local barrier dune issues.

15A NCAC 07H .0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS

(a) This Paragraph describes natural and man-made features that are found within the ocean hazard area of environmental concern.

- (1) Ocean Beaches. Ocean beaches are lands consisting of unconsolidated soil materials that extend from the mean low water line landward to a point where either:
 - (A) the growth of vegetation occurs; or
 - (B) a distinct change in slope or elevation alters the configuration of the landform, whichever is farther landward.
- (2) Nearshore. The nearshore is the portion of the beach seaward of mean low water that is characterized by dynamic changes both in space and time as a result of storms.
- (3) Primary Dunes. Primary dunes are the first mounds of sand located landward of the ocean beaches having an elevation equal to the mean flood level (in a storm having a one percent chance of being equaled or exceeded in any given year) for the area plus six feet. Primary dunes extend landward to the lowest elevation in the depression behind that same mound of sand (commonly referred to as the “dune trough.”)
- (4) Frontal Dunes. The frontal dune is the first mound of sand located landward of the ocean beach that has stable and natural vegetation present.
- (5) Vegetation Line. The vegetation line refers to the first line of stable and natural vegetation, which shall be used as the reference point for measuring oceanfront setbacks. This line represents the boundary between the normal dry-sand beach, which is subject to constant flux due to waves, tides, storms and wind, and the more stable upland areas. The vegetation line is generally located at or immediately oceanward of the seaward toe of the frontal dune or erosion escarpment. The Division of Coastal Management or Local Permit Officer shall determine the location of the stable and natural vegetation line based on visual observations of plant composition and density. If the vegetation has been planted, it may be considered stable when the majority of the plant stems are from continuous rhizomes rather than planted individual rooted sets. Planted vegetation may be considered natural when the majority of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are similar to adjacent areas that are naturally occurring. In areas where there is no stable and natural vegetation present, this line may be established by interpolation between the nearest adjacent stable natural vegetation by on-ground observations or by aerial photographic interpretation.
- (6) Static Vegetation Line. In areas within the boundaries of a large-scale beach fill project, the vegetation line that existed within one year prior to the onset of project construction shall be defined as the “static vegetation line.” The “onset of project construction” shall be defined as the date sediment placement begins, with the exception of projects completed prior to the effective date of this Rule, in which case the award of the contract date will be considered the onset of construction. A static vegetation line shall be established in coordination with the Division of Coastal Management using on-ground observation and survey or aerial imagery for all areas of oceanfront that undergo a large-scale beach fill project. Once a static vegetation line is established, and after the onset of project construction, this line shall be used as the reference point for measuring oceanfront setbacks in all locations where it is landward of the vegetation line. In all locations where the vegetation line as defined in this Rule is landward of the static vegetation line, the vegetation line shall be used as the reference point for measuring oceanfront setbacks. A static vegetation line shall not be established where a static vegetation line is already in place, including those established by the Division of Coastal Management prior to the effective date of this Rule. A record of all static vegetation lines, including those established by the Division of Coastal Management prior to the effective date of this Rule, shall be maintained by the Division of Coastal Management for determining development standards as set forth in Rule .0306 of this Section. Because the impact of Hurricane Floyd (September 1999) caused significant portions of the vegetation line in the Town of Oak Island and the Town of Ocean Isle Beach to be relocated landward of its pre-storm position, the static line for areas landward of the beach fill construction in the Town of Oak Island and the Town of Ocean Isle Beach, the onset of which occurred in 2000,

shall be defined by the general trend of the vegetation line established by the Division of Coastal Management from June 1998 aerial orthophotography.

- (7) Beach Fill. Beach fill refers to the placement of sediment along the oceanfront shoreline. Sediment used solely to establish or strengthen dunes shall not be considered a beach fill project under this Rule. A “large-scale beach fill project” shall be defined as any volume of sediment greater than 300,000 cubic yards or any storm protection project constructed by the U.S. Army Corps of Engineers.
- (8) Erosion Escarpment. The normal vertical drop in the beach profile caused from high tide or storm tide erosion.
- (9) Measurement Line. The line from which the ocean hazard setback as described in Rule .0306(a) of this Section is measured in the unvegetated beach area of environmental concern as described in Rule .0304(3) of this Section. Procedures for determining the measurement line in areas designated pursuant to Rule .0304(3) of this Section shall be adopted by the Commission for each area where such a line is designated pursuant to the provisions of G.S. 150B. These procedures shall be available from any local permit officer or the Division of Coastal Management. In areas designated pursuant to Rule .0304(3)(b) of this Section, the Division of Coastal Management shall establish a measurement line that approximates the location at which the vegetation line is expected to reestablish by:
 - (A) determining the distance the vegetation line receded at the closest vegetated site to the proposed development site; and
 - (B) locating the line of stable and natural vegetation on the most current pre-storm aerial photography of the proposed development site and moving this line landward the distance determined in Subparagraph (a)(1) of this Rule.

The measurement line established pursuant to this process shall in every case be located landward of the average width of the beach as determined from the most current pre-storm aerial photography.

- (10) Development Line. The line established in accordance with 15A NCAC 07J .1300 by local governments representing the seaward-most allowable location of oceanfront development. In areas that have development lines approved by the CRC, the vegetation line or measurement line shall be used as the reference point for measuring oceanfront setbacks instead of the static vegetation line, subject to the provisions of Rule 07H .0306(a)(2) of this Section.

(b) For the purpose of public and administrative notice and convenience, each designated minor development permit-letting agency with ocean hazard areas may designate, subject to CRC approval in accordance with the local implementation and enforcement plan as defined in 15A NCAC 07I .0500, an identifiable land area within which the ocean hazard areas occur. This designated notice area must include all of the land areas defined in Rule .0304 of this Section. Natural or man-made landmarks may be considered in delineating this area.

15A NCAC 07H .0308 SPECIFIC USE STANDARDS FOR OCEAN HAZARD AREAS

(b) Dune Establishment and Stabilization. Activities to establish dunes shall be allowed so long as the following conditions are met:

- (1) Any new dunes established shall be aligned to the greatest extent possible with existing adjacent dune ridges and shall be of the same general configuration as adjacent natural dunes.
- (2) Existing primary and frontal dunes shall not, except for beach nourishment and emergency situations, be broadened or extended in an oceanward direction.
- (3) Adding to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The filled areas shall be immediately replanted or temporarily stabilized until planting can be successfully completed.
- (4) Sand used to establish or strengthen dunes shall be of the same general characteristics as the sand in the area in which it is to be placed.
- (5) No new dunes shall be created in inlet hazard areas.
- (6) Sand held in storage in any dune, other than the frontal or primary dune, may be redistributed within the AEC provided that it is not placed any farther oceanward than the crest of a primary dune or landward toe of a frontal dune.
- (7) No disturbance of a dune area shall be allowed when other techniques of construction can be utilized and alternative site locations exist to avoid unnecessary dune impacts.

(c) Structural Accessways:

- (1) Structural accessways shall be permitted across primary dunes so long as they are designed and constructed in a manner that entails negligible alteration on the primary dune. Structural accessways shall not be considered threatened structures for the purpose of Paragraph (a) of this Rule.
- (2) An accessway shall be conclusively presumed to entail negligible alteration of a primary dune provided that:
 - (A) The accessway is exclusively for pedestrian use;
 - (B) The accessway is less than six feet in width;
 - (C) The accessway is raised on posts or pilings of five feet or less depth, so that wherever possible only the posts or pilings touch the frontal dune. Where this is deemed impossible, the structure shall touch the dune only to the extent absolutely necessary. In no case shall an accessway be permitted if it will diminish the dune's capacity as a protective barrier against flooding and erosion; and
 - (D) Any areas of vegetation that are disturbed are revegetated as soon as feasible.
- (3) An accessway which does not meet Part (2)(A) and (B) of this Paragraph shall be permitted only if it meets a public purpose or need which cannot otherwise be met and it meets Part (2)(C) of this Paragraph. Public fishing piers shall not be deemed to be prohibited by this Rule, provided all other applicable standards are met.
- (4) In order to avoid weakening the protective nature of primary and frontal dunes a structural accessway (such as a "Hatteras ramp") shall be provided for any off-road vehicle (ORV) or emergency vehicle access. Such accessways shall be no greater than 10 feet in width and shall be constructed of wooden sections fastened together over the length of the affected dune area.

(d) Building Construction Standards. New building construction and any construction identified in .0306(a)(5) and 07J .0210 shall comply with the following standards:

- (1) In order to avoid danger to life and property, all development shall be designed and placed so as to minimize damage due to fluctuations in ground elevation and wave action in a 100-year storm. Any building constructed within the ocean hazard area shall comply with relevant sections of the North Carolina Building Code including the Coastal and Flood Plain Construction Standards and the local flood damage prevention ordinance as required by the National Flood Insurance Program. If any provision of the building code or a flood damage prevention ordinance is inconsistent with any of the following AEC standards, the more restrictive provision shall control.

- (2) All building in the ocean hazard area shall be on pilings not less than eight inches in diameter if round or eight inches to a side if square.
- (3) All pilings shall have a tip penetration greater than eight feet below the lowest ground elevation under the structure. For those structures so located on or seaward of the primary dune, the pilings shall extend to five feet below mean sea level.
- (4) All foundations shall be adequately designed to be stable during applicable fluctuations in ground elevation and wave forces during a 100-year storm. Cantilevered decks and walkways shall meet this standard or shall be designed to break-away without structural damage to the main structure.