

7 ENVIRONMENTAL PROTECTION STANDARDS

Chapter 7. Environmental Protection Standards

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CHAPTER 7.

ENVIRONMENTAL

PROTECTION

7.1. OPEN SPACE SET-ASIDES

7.1.1. Purpose and Intent

The purpose of this section is to:

- A.** Establish the standards under which residential and mixed-use development shall set aside a portion of the development area as open space;
- B.** Distinguish between the characteristics, requirements, and appropriate locations for open space set-asides; and
- C.** Establish minimum ownership and maintenance standards for homeowner and property owner associations related to open space set-asides.

7.1.2. Applicability

A. General

Unless exempted by Section 7.1.2.E, Exemptions, the provisions of this section shall apply to all residential and residential portions of mixed-use development in the county.

B. Time of Review

Review for compliance with these standards shall occur during review of a site plan (see Section 2.4.7), subdivision (see Section 2.4.8), or planned development master plan (see Section 2.4.5), as appropriate.

C. Existing Development

Unless redeveloped, the standards in this section shall not apply to development existing prior to January 1, 2013. Redevelopment conducted after January 1, 2013 shall comply with the standards in this section, to the maximum extent practicable, and shall provide its pro rata share of open space set-aside.

D. Conservation Subdivisions

Open space set-asides associated with a conservation subdivision shall be subject to the standards in Section 6.4, Conservation Subdivision.

E. Preservation Subdivisions

Open space set-asides associated with a preservation subdivision shall be subject to the standards in Section 6.7, Preservation Subdivision.

F. Exemptions

The following forms of development shall be exempted from the standards in this section:

- (I)** Development of a single-family detached or two- to four-family dwelling on a platted lot in existence on January 1, 2013; and

- (2) Subdivisions with fewer than 6 lots (except preservation subdivisions).

7.1.3. Open Space Set-Aside Standards

A. Amount of Open Space Set-Asides Required

(1) In the MXR District

Development in the MXR district shall provide open space set-asides in accordance with Section 3.4.6.D, Dimensional Standards.

(2) In all Other Districts

- (a) Residential development subject to the standards of this section shall set aside 30 percent of the total development area as open space set-asides.
- (b) Mixed-use development that includes residential dwelling units subject to the standards of this section shall set aside 20 percent of the total development area as open space set-asides.

B. Calculation of Open Space Set-Asides

(1) Features Counted as Open Space Set-Asides

The following site features shall be credited towards the open space set-aside requirement:

(a) Environmentally-Sensitive Lands

CAMA wetlands, U.S. Army Corps of Engineers designated 404 wetlands, water features (drainage canals, lakes, natural ponds, streams, rivers, etc.), maritime forest, and habitat utilized by endangered or threatened species or designated Natural Heritage Areas. These items must be placed in a conservation easement prior to final plat approval.

(b) Beach Systems

Significant sand dunes and lands shoreward of the first line of significant vegetation.

(c) Required Landscaping and Tree Protection Zones

Areas occupied by required landscaping or tree protection zones.

(d) Required Setbacks

Required agricultural and riparian buffers setbacks.

(e) Farming and Forestry Lands

Lands in active agricultural production taking place within the boundary of the development subject to these open space set-aside standards.

(f) Recreation and Park Areas and Payment-in-Lieu

Lands dedicated to the county as recreation and park areas and acreage amounts used to derive payment-in-lieu amounts for recreation and park area dedication.

(g) Private Active Recreational Areas

Land occupied by active recreational uses such as pools, playgrounds, tennis courts, jogging trails, and clubhouses.

(h) Private Passive Recreational Areas

Passive recreation areas such as trails, walkways, and open fields or meadows.

(i) Functionally-Dependent Features

Docks, swimming platforms, boat launches, and boardwalks providing access to estuarine and surface waters.

(j) Urban Features

Plazas, fountains, roof gardens, atriums, and pedestrian seating/activity areas in the SFO, CC, and VC districts.

(k) Stormwater Management Site Amenities

Land area occupied by stormwater management devices, including retention ponds, fully vegetated detention basins, and other bio-retention devices treated as a site amenity that includes access, gentle slopes of three-to-one (3:1) or less, and pedestrian elements such as paths, benches, and similar aspects.

(2) Not Counted as Open Space Set-Asides

The following areas shall not be counted as open space set-asides:

- (a)** Private yards not subject to an open space or conservation easement;
- (b)** Public street rights-of-way or private street easements;
- (c)** Open parking areas and driveways for dwellings;
- (d)** Land covered by structures not designated for active recreational uses; and
- (e)** Designated outdoor storage areas, including shared parking and storage of major recreational equipment. Shared parking and storage of major recreational equipment may be located in open space, but shall not be counted as required open space and open space set-asides.

(3) Insufficient Natural Features

- (a)** In cases where the land to be set aside as open space is outside of G-2, G-3, or G-4 transects of the Land Use Plan and lacks environmental features like wetlands or tree cover (such as a former farm field), the open space set-aside area shall be reforested with mixed hardwoods at a rate of 40 trees per acre.
- (b)** The amount of land area to be reforested shall be the minimum necessary to ensure at least half the open space set-aside is occupied by trees or other environmental features.

C. Design Standards for Open Space Set-Asides

Land used as an open space set-aside shall meet the following design standards:

(1) Location

Open space shall be located so as to be readily accessible and useable by residents and users of the development. Where possible, a portion of the open space set-aside should provide focal points for the development.

(2) Adjacent to Existing or Planned Open Space

Where the development site is adjacent to existing or planned trails, parks, or other public open area land, the open space set-aside shall, to the maximum extent practicable, be located to adjoin, extend, and enlarge the trail, park, or other open area land (see Figure 7.1.3.C, Open Space Location).

Figure 7.1.3, Open Space Location



(3) Configuration

- (a)** Lands set aside as open space shall be compact and contiguous unless the land is used as a continuation of an existing trail, or specific natural or topographic features require a different configuration.
- (b)** Open space set-asides within the PD-O district shall also comply with the standards in Section 3.7.5.A.4, Open Space Design.

(4) Active Recreation Features

Open space set-asides in multi-family and mixed-use development not subject to the standards in Section 6.5, Recreation and Park Area Dedication, shall provide active recreation features that occupy at least 35 percent of the open space set-aside area.

(5) Prioritization of Open Space Set-Aside

To the maximum extent practicable, the open space set-aside should be located and organized to include, protect, or enhance as many of the following open areas and features as possible:

- (a)** Environmentally-sensitive lands and natural features such as riparian buffers, riparian areas, significant sand dunes, lands shoreward of the first stable line of vegetation, wildlife corridors, and mature trees (four-inch caliper or greater);
- (b)** Lands that may extend or enhance existing park or open space features;
- (c)** Water features such as canals, lakes, natural ponds, and retention and detention ponds configured as amenities;
- (d)** Landscaped buffers or visual transitions between different types or intensities of uses;
- (e)** Habitat for endangered species; and
- (f)** Areas that accommodate multiple compatible open space uses rather than a single use.

(6) Provision in Multi-Phase Developments

- (a)** Multi-phase development shall preserve open space set-asides in phases, so that the first phase of development does not contain 100 percent of

the open space allotted for the entire development, but does contain, at a minimum, its pro rata share of the total amount of required open space set aside.

- (b) Open space set-asides shall be apportioned among phases such that the total amount of open space set aside in a phase and any previously approved phases meets the open space set-aside standard as applied to the total area of the phase and previously approved phases.

D. Allowable Uses in Open Space Set-Asides

Open space set-aside areas shall not be disturbed, developed, or improved with any structures except for the following limited purposes:

(1) Active Recreation Uses

Structures for active recreation purposes—including pedestrian-scaled lighting; gazebos or other decorative structures; fountains or other water features; swimming pools; club houses; play structures for children; gardens or seasonal planting areas; or ball fields used primarily for recreational purposes (equipment or structures shall be indicated on site plans, subdivision plats, or planned development master plans.

(2) Passive Recreational Uses

Facilities for passive recreational, environmental education, wildlife habitat protection, and natural area preservation purposes—including, but not limited to: undisturbed land; walking, jogging, and biking paths or trails; benches or other seating areas; tables, shelters, grills, and other picnicking facilities; open and unimproved fields or lawn areas; docks and other facilities for fishing; and environmental guides and exhibits.

(3) Public Facilities

Public features such as libraries, community centers, museums, historic sites, and similar features.

(4) Conservation Lands

Areas of undisturbed land and vegetation.

(5) Farming and Forestry Lands

Active agricultural operations, including farming and forestry.

E. Ownership of Open Space Set-Asides

(1) Homeowners or Property Owners Association

All open space set-aside areas may be owned jointly or in common by the owners of the development through a recognized homeowners or property owners association, which shall be established in accordance with Section 6.1.4, Homeowners or Property Owners Association Requirements.

(2) Individual Private Ownership

Up to 85 percent of open space set-aside areas may be owned by a private individual such as a farmer, developer or other private entity provided it is used in accordance with Section 7.1.3.D Allowable Uses in Open Space Set-Asides.

(3) Nonprofit Organization

The landowners may decide to convey an open space set-aside to a nonprofit organization such as a land trust or land conservancy for management and

maintenance if the county is provided adequate assurance the set-aside will be properly managed and maintained.

(4) Dedicated to County or Other Public Agency

In some cases, certain lands designated as open space set-asides, such as wildlife habitat, may be dedicated to the county or other public agency during the development review process. The Board of Commissioners shall determine which lands and under what conditions open space set-asides may be dedicated to the county or other public agency.

F. Maintenance of Open Space Set-Asides

The owner of the land shall be responsible for maintenance of all open space set-aside areas. Failure to maintain open space set-aside areas is a violation of this Ordinance subject to the remedies and penalties in Chapter 9: Enforcement.

7.2. TREE PROTECTION

7.2.1. Purpose and Intent

The purpose and intent of this section is to:

- A.** Preserve the visual and aesthetic qualities of the county;
- B.** Encourage site design techniques that preserve the natural environment and enhance the developed environment;
- C.** Provide for a separation of uses and establish a sense of privacy;
- D.** Minimize the impact of incompatible land uses;
- E.** Reduce glare, dust, heat, and noise;
- F.** Preserve and enhance air and water quality;
- G.** Increase slope stability, and control erosion and sediment run-off into streams and waterways;
- H.** Conserve energy by reducing heating and cooling costs; and
- I.** Maintain and enhance the quality of life in the county.

7.2.2. Applicability

A. General

Unless exempted in accordance with Section 7.2.2.C, Exemptions, the standards in this section shall apply to all lands and development in the county.

B. Time of Review

No removal of existing heritage trees on a parcel of land or a development site shall occur prior to approval of a clear-cutting permit (Section 2.4.13), site plan (Section 2.4.7), planned development master plan (Section 2.4.5), subdivision (Section 2.4.8), or zoning compliance permit (Section 2.4.9), as appropriate.

C. Exemptions

The following tree removal activities are exempt from the standards of this section:

- (1)** The removal of dead or naturally fallen trees;
- (2)** The removal of diseased trees posing a threat to adjacent trees;

- (3) The selective and limited removal of trees or vegetation necessary to obtain clear visibility within sight distance triangles;
- (4) Removal of trees on developed single-family residential lots or lots within a single-family residential subdivision platted prior to January 1, 2013;
- (5) Land-disturbing activities and tree removal in accordance with a site plan, preliminary plat, or building permit approved after January 1, 2013;
- (6) Removal of trees as necessary to maintain safe operations at the Currituck County Airport;
- (7) Land-disturbing activities and tree removal on unbuildable lands;
- (8) The removal of vegetation by public or private agencies within the lines of any right-of-way, easement, or other county-owned lands as may be necessary to ensure public safety; and
- (9) Land disturbing activities undertaken on land under agricultural, horticultural, or forest production and taxed at present-use value in accordance with Sections 105-277.2 through 277.7 of the North Carolina General Statutes.

7.2.3. Protection of Heritage Trees

A. Heritage Trees Defined

- (1) For the purposes of this section, “heritage trees” shall include all existing Live Oak (*Quercus Virginiana*) with a diameter at breast height (DBH) of 12 inches or greater, as well as all other existing trees with a DBH of 24 inches or greater.
- (2) Some trees, regardless of their size, shall not be considered as heritage trees. These trees include:
 - (a) Southern yellow pine;
 - (b) Bradford pear;
 - (c) Mulberry;
 - (d) Sweet gum; and
 - (e) Silver maple.

B. Procedure for the Establishment of a Tree Protection Zone

(I) Tree Inventory Required

Prior to any tree clearing, development work, or land disturbing activity, the owner of land subject to this section shall prepare and submit an inventory of heritage trees on the development site, subject to the following requirements:

(a) General

The inventory shall identify all existing, healthy heritage trees on the development site. Known dead or diseased heritage trees shall be identified, where practical. Groups of heritage trees in close proximity (i.e., those within five feet of each other) may be designated as a clump of trees, with the predominant species, estimated number, and average diameter indicated.

(b) Inclusion of Other Trees

The tree inventory shall also depict the location, species, and diameter of existing trees (other than heritage trees) to be retained and credited

towards the landscaping requirements in Section 5.2, Landscaping Standards.

(c) Professionally Prepared

Tree inventories for lots larger than one acre in size shall be prepared by a licensed landscape architect, surveyor, arborist, registered forester, or professional engineer and shall have an accuracy of plus or minus three feet.

(2) Establishment of Tree Protection Zone

Concurrent with, or following the preparation of a tree inventory, the owner of land subject to this section shall prepare and submit a tree protection zone diagram, subject to the following requirements:

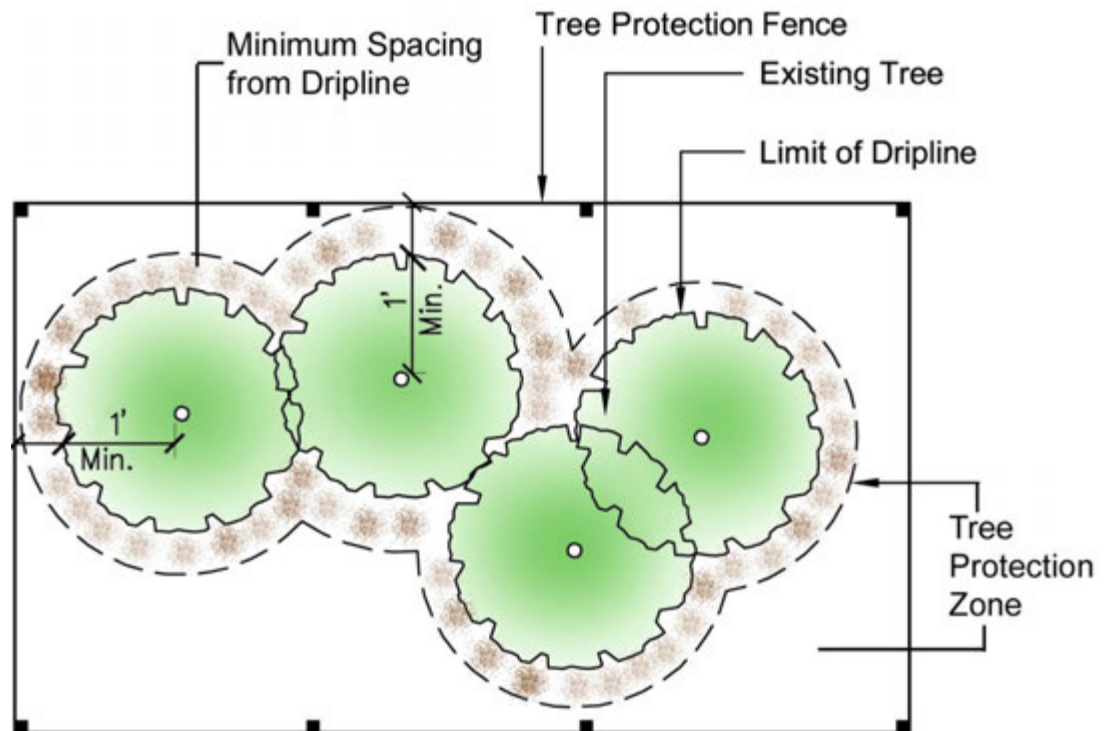
(a) Location

- (i)** A designated tree protection zone shall be demarcated on a site plan, planned development master plan, grading plan, preliminary plat, or final plat (as appropriate).
- (ii)** Tree protection zones associated with a subdivision shall be located within an open space set-aside and outside of all buildable lots.

(b) Area Within Tree Protection Zone

The tree protection zone shall incorporate the root zones and driplines of all heritage trees and other trees to be retained in accordance with this section and Section 7.2.6, Tree Protection Incentives (see Figure 7.2.3, Tree Protection Zones).

Figure 7.2.3, Tree Protection Zones



C. Standards for Protection

A heritage tree shall not be removed, except in accordance with Section 7.2.3.D, Removal of a Heritage Tree. In addition, heritage trees shall have the following protections, whether located on public or private land:

(1) Cutting, Removal, or Harm Prohibited

Heritage trees shall not be cut, removed, pushed over, killed, or otherwise harmed.

(2) Soil Compaction Prohibited

The area within the dripline of any heritage tree shall not be subject to soil compaction greater than 25 percent of the total area within the dripline, or within 12 feet of the tree trunk.

(3) Encroachment

(a) Buildings or other structures shall not encroach within a designated tree protection zone.

(b) Impervious surfaces may encroach into a dripline in the following amounts:

(i) A maximum of 25 percent of the dripline associated with a heritage tree, but no closer than 12 feet from the trunk of a heritage tree; and

(ii) A maximum of 50 percent of the dripline associated with an existing tree (other than a heritage tree) designated for retention, but no closer than six feet from a tree's trunk.

Authorized encroachments into a dripline shall not be included within a tree protection zone.

(4) Established Prior to Land Disturbance

The tree protection zone shall be established on the development site in accordance with Section 7.2.5, Tree Protection During Construction, prior to any development or land disturbance.

(5) Protection During Construction

Trees in a tree protection zone shall be protected during construction in accordance with the standards in Section 7.2.5, Tree Protection During Construction.

D. Removal of Heritage Trees

Heritage trees may only be removed if the landowner demonstrates to the Director one of the following two conditions:

(1) Removal of a Healthy Heritage Tree

(a) The landowner is otherwise in compliance with this section;

(b) The heritage tree prevents development of a lot platted prior to January 1, 2013 in a way that limits building area to less than otherwise allowed;

(c) The heritage tree hinders compliance with the standards in Chapter 3: Zoning Districts, Chapter 5: Development Standards, or Chapter 6: Subdivision and Infrastructure Standards; and

(d) Mitigation is provided in accordance with Section 7.2.3.E, Replacement/Mitigation of Heritage Trees.

(2) Removal of a Severely Diseased, High Risk, or Dying Heritage Tree

A heritage tree certified by an arborist or other qualified professional as severely diseased, high risk, or dying may be removed without replacement or mitigation in accordance with Section 7.2.3.E, Replacement/Mitigation of Heritage Trees.

E. Replacement/Mitigation of Heritage Trees

Those causing the destruction or removal of a healthy heritage tree, unless exempted, shall be responsible for the following mitigation:

(1) Replacement Trees Required

Each healthy heritage tree removed or destroyed shall be replaced by replacement trees with a cumulative caliper measurement that equals or exceeds one-half the diameter of the heritage tree(s) removed. Each replacement tree shall be at least two inches in caliper at the time of planting, and be replanted within 12 months of the removal or destruction of the heritage tree(s). At least one-half of the cumulative caliper inches of the replacement trees shall be of the same species as the heritage tree removed.

(2) Location of Replacement Trees

Replacement trees shall be either planted on the parcel of land from which the heritage tree(s) was removed, if sufficient space is available, or placed on nearby lands in accordance with Section 5.2.9, Alternative Landscape Plan.

(3) Establishment Period

Replacement trees shall be maintained through an establishment period of at least three years. The applicant shall guarantee the survival and health of all replacement trees during the establishment period and guarantee any associated replacement costs (see Section 6.3, Performance Guarantees). If the replacement trees do not survive the establishment period, the applicant shall purchase and install new replacement trees.

7.2.4. Responsibility for Compliance

Failure to comply with the standards of this section is a violation of this Ordinance subject to the remedies and penalties in this section and Chapter 9: Enforcement.

7.2.5. Tree Protection During Construction

A. Owner's Responsibility

During development, the owner or developer shall be responsible for the erection of any and all barriers necessary to protect any heritage trees or existing vegetation to be credited towards landscaping requirements from damage during construction.

B. Tree Protection Fencing

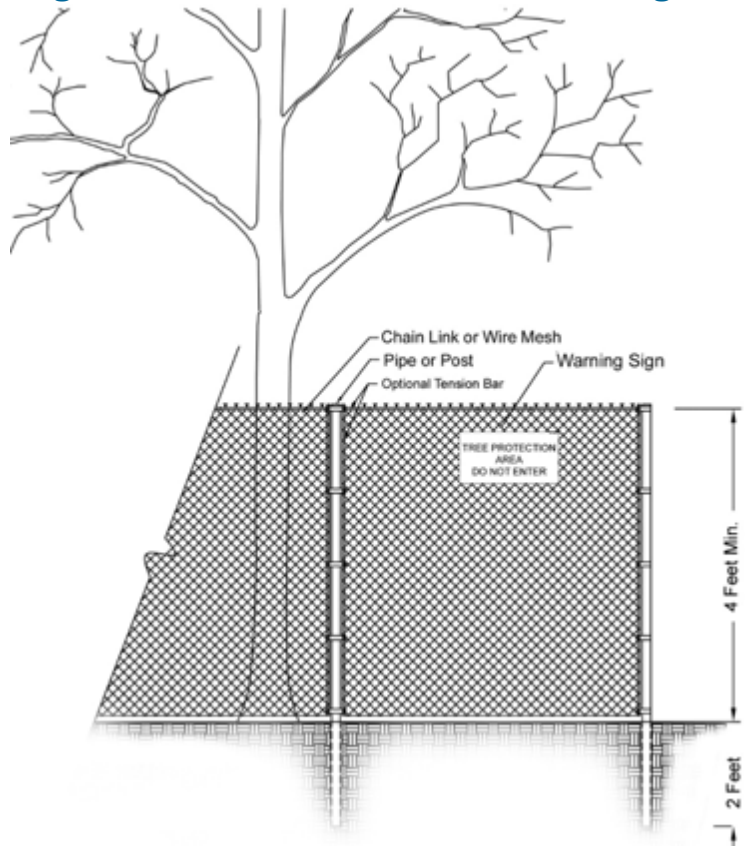
(1) Where Required

Heritage trees and existing trees being used for credit towards landscaping requirements retained in a tree protection zone shall be fenced with a sturdy and visible fence before grading or other development activity begins. The Director shall consider the existing site conditions and the location of allowable encroachments in determining the exact location of tree protection fencing. Areas located inside of tree protection fencing are considered as "tree save areas."

(2) Type of Fencing

All fencing required by this section shall be a minimum four feet high and of durable construction (i.e., chain link or wooden post with 2x4 wire mesh). Posts shall be located no more than ten feet on-center (see Figure 7.2.5, Tree Protection Fencing). Passive forms of tree protection may be utilized to delineate tree protection zones that are remote from areas of land disturbance. These must be surrounded by fencing, continuous rope, or durable taping (minimum four inches wide).

Figure 7.2.5, Tree Protection Fencing



(3) Signage

Signs shall be installed on the tree protection fence visible on all sides of the fenced-in area at a rate of at least one for every 150 linear feet. The size of each sign must be a minimum of two feet by two feet and shall contain the following language: "TREE PROTECTION ZONE: KEEP OUT."

(4) Trenching Prior to Clearing

The removal of trees adjacent to tree protection zones can cause inadvertent damage to the protected trees. Prior to clearing activities, trenches with a minimum width of one-and-one-half inches and a minimum depth of 12 inches shall be cut along the limits of land disturbance, so as to cut, rather than tear tree roots.

(5) Inspection

All tree protection measures shall be inspected and approved by the Director prior to start of any land disturbing activities. Failure to have tree protection measures prior to the commencement of construction is a violation of this Ordinance.

C. Encroachments into Tree Protection Zones

Encroachments into tree protection zones may occur only when no other alternative exists. If such an encroachment is anticipated, the following preventive measures shall be employed:

(1) Soil Compaction

Where compaction might occur due to construction traffic or materials delivery through a tree protection zone, the area must first be mulched with a minimum four inch layer of wood chips. Equipment or materials storage shall not be allowed within a tree protection zone.

(2) Fill

No fill shall be placed within a tree protection zone without adequate venting to allow air and water to reach the roots.

(3) Chemical Contamination

Trees located within a tree protection zone shall be protected from chemical contamination from liquids or other materials, including but not limited to paint, chemical solvents, gasoline, oil, diesel fuel, hydraulic fluid, concrete spoils, or rinse water from vehicle cleaning, including rinsing of concrete truck tanks and chutes.

7.2.6. Tree Preservation Incentives

A. Tree Preservation Credits

In order to encourage the preservation of as many trees as practical on a development site, credit towards the minimum landscaping requirements shall be applied to all existing trees retained on a site. Credits shall be granted in accordance with Section 5.2.3.D, Credit for Existing Vegetation.

B. Reduction in the Minimum Number of Required Parking Spaces

Up to a five percent reduction in the number of off-street parking spaces required on a development site shall be allowed if the reduction in the amount of required pavement will preserve the root zones of existing healthy trees with a DBH of six inches or greater. The amount of reduction can be determined only after taking into consideration any unique site conditions and the impact of the reduction on parking needs for the use, and must be agreed upon by both the applicant and the Director.

7.3. STORMWATER MANAGEMENT

7.3.1. Purpose and Intent

- A.** The purpose of this section is to establish the standards for stormwater management in the county that are required in conjunction with development to prevent nuisance flooding and promote water quality protection of Currituck Sound, Albemarle Sound, the North River, and their tributaries.
- B.** More specifically, it is the intent of this section to:
 - (1)** Distinguish between hydrologic, soil, and topographic conditions by establishing stormwater management zones;

- (2) Establish county-wide performance standards for controlling stormwater runoff from development sites and promoting water quality;
- (3) Better control how fill material may be placed on a lot to avoid negative flooding impacts on adjacent lots; and
- (4) Establish maintenance standards for landowners, homeowners or property owners associations related to stormwater management devices.

7.3.2. Applicability

A. General

Unless exempted in accordance with Section 7.3.2.E, Exemptions, all development in the county shall comply with the stormwater management standards in this section.

B. Time of Review

Review for compliance with these standards shall occur as part of review of a site plan (see Section 2.4.7), subdivision (see Section 2.4.8), or zoning compliance permit (see Section 2.4.9), as appropriate.

C. Existing Development or Redevelopment

Development or redevelopment of an existing site subject to the standards of this section shall manage stormwater from all previously developed portions of the lot, to the maximum extent practicable.

D. Stormwater Management Zones

In order to distinguish between hydrologic, soil, and topographic conditions the county is divided into the following stormwater management zones depicted in the Currituck County Stormwater Manual:

(1) Mainland Stormwater Management Zone

Areas of the county not directly connected to the Outer Banks characterized by expansive areas of wetlands and land areas under cultivation, with narrow ridges exhibiting topographic relief and soils more conducive to drainage.

(2) Outer Banks Management Zone

The barrier island portion of the county characterized by predominantly sandy, porous soils with high connectivity between surface waters and groundwater table.

E. Exemptions

The standards in Section 7.3.4.B shall not apply to the following:

(1) Mainland Stormwater Management Zone

- (a) Minor site plans;
- (b) Minor subdivisions;
- (c) The division of five or fewer additional lots with an average lot size greater than three acres located within a single-family residential subdivision platted prior to January 1, 2013;
- (d) Development or expansion on a nonresidential, multi-family, or mixed-use lot by less than 5,000 square feet of impervious surface or resulting in less than 10 percent total lot coverage. This exemption does not include multiple, incremental expansions that result in a reduction of stormwater management standards; or

- (e) Major site plans on lots in subdivisions that have a state permitted and functional stormwater management system that specifies allowable lot coverage.
- (2) **Outer Banks Stormwater Management Zone**
 - (a) Minor site plans, excluding single-family detached dwellings on lots resulting in more than 10,000 square feet of total impervious surface; or
 - (b) Development or expansion on a nonresidential, multi-family, or mixed-use lot by less than 5,000 square feet of impervious surface or resulting in less than 10 percent total lot coverage. This exemption does not include multiple, incremental expansions that result in a reduction of stormwater management standards.

7.3.3. Stormwater Plan

To ensure compliance with the standards of this section, a stormwater plan demonstrating how stormwater will be managed on a development site shall be included with any application for site plan, subdivision, or zoning compliance permit, as appropriate. The Currituck County Stormwater Manual includes additional information and plan requirements for persons submitting applications for development review under the standards of this section.

7.3.4. Stormwater Management Standards

A. Drainage Requirements

- (1) To the maximum extent practicable, all development shall conform to the natural contours of the land and natural and pre-existing man-made drainage ways shall remain undisturbed.
- (2) To the maximum extent practicable, lot boundaries shall be made to coincide with natural and pre-existing man-made drainage ways within subdivisions to avoid the creation of lots that can be built upon only by altering such drainage ways.
- (3) No surface water may be channeled or directed into a sanitary sewer.
- (4) Whenever practicable, the drainage system of a development shall coordinate with and connect to the drainage systems or drainage ways on surrounding properties or streets.
- (5) All developments shall be constructed and maintained so that adjacent lands are not unreasonably burdened with surface waters as a result of such developments. More specifically:
 - (a) No development may be constructed or maintained so that such development unreasonably impedes the natural flow of water from higher adjacent properties across such development, thereby unreasonably causing substantial damage to such higher adjacent properties; and,
 - (b) No development may be constructed or maintained so that surface waters from such development are unreasonably collected and channeled onto lower adjacent properties at such locations or at such volumes as to cause substantial damage to such lower adjacent properties.

- (6)** Existing ditches located totally or partially within a development and utilized for drainage or stormwater management shall be cleaned to remove drainage impediments.
- (7)** All subdivisions shall provide side lot line swales with a minimum average depth of 12 inches and side slopes not to exceed 3:1 (three feet horizontal run for every one foot vertical rise), unless the County Engineer approves an equivalent drainage alternative.
- (8)** Major subdivisions and major site plans shall provide minimum building pad elevations required to prevent flooding from the 24-hour storm event with a 10-year recurrence interval. The finished floor elevation for all principal structures shall be 18 inches above the 24-hour storm event with a 10-year recurrence interval and shall be depicted on construction drawings and final plats.
- (9)** Finished floor elevations shall be at least six inches above septic system fill.
- (10)** Development subject to these standards shall provide maintenance access drainage easements and point of entry to the county in accordance with the following standards:
 - (a)** Easements shall be provided along at least one side of waterway conveyance systems that drain more than five acres provided the waterway conveyance system is not part of a state permitted and functional stormwater management system. The easement shall include the conveyance and an additional twenty-five feet measured from the top of embankment.
 - (b)** Easements shall be provided along both sides of the following waterway conveyance systems:
 - (i)** Hog Bridge Ditch;
 - (ii)** Guinea Mill;
 - (iii)** Upper Guinea Mill;
 - (iv)** Lateral "A";
 - (v)** Lateral "B";
 - (vi)** Lateral "C";
 - (vii)** Haywood Ditch;
 - (viii)** Rowland Creek Canal;
 - (ix)** Eagle Creek Canal (also known as Western Canal); and
 - (x)** Shingle Landing Creek Canal.

The easement shall include the conveyance and an additional twenty-five feet measured from the top of each embankment.

B. Stormwater Detention Requirements

- (1)** In the Outer Banks Stormwater Management Zone, minor subdivisions or single-family detached dwellings on lots resulting in more than 10,000 square feet of total impervious surface shall implement adequate stormwater practices to capture and infiltrate stormwater runoff from all impervious surfaces from the first four inches of rain from any rainfall event.
- (2)** Major subdivisions, with the exception of a Type I subdivision of multi-family-townhouse development, subject to these standards shall implement adequate stormwater practices to reduce the post-development peak discharge from the

24-hour storm event with a 10-year recurrence interval down to the pre-development discharge rate from the 24-hour storm event with a 2-year recurrence interval based on pre-development conditions from a wooded site.

- (3) All other development subject to these standards shall implement adequate stormwater practices to reduce the post-development peak discharge from the 24-hour storm event with a 5-year recurrence interval down to the pre-development discharge rate from the 24-hour storm event with a 2-year recurrence interval based on pre-development conditions from a wooded site.

C. Fill and Other Land Disturbance Requirements

- (1) Unless stated otherwise in this Ordinance, the provisions of this section shall apply to any land disturbance activity regardless of the size of the disturbed area, or when filling or grading above any adjacent grade is proposed.
- (2) Fill and land disturbing activities, excluding clearing, grubbing and landscaping, shall not be permitted within ten feet from any lot line with the exception of drainage and stormwater improvements as approved by the County Engineer, underground utilities, and exemptions or encroachments as allowed in Section 10.3.4, Required Setbacks. Improvements permitted within this area are allowed as long as they do not impede the flow of stormwater.
- (3) A lot shall not be filled or graded higher than the average adjacent grade of the first 30 feet of adjoining property. Through approval of an alternative stormwater plan in accordance with Section 7.3.5.B.3, Additional Fill or Land Disturbance Activities, the following exceptions are permitted:
 - (a) When Albemarle Regional Health Services (ARHS) determines that fill is necessary for a septic system to function properly. The maximum fill area shall be limited to the septic system and drainfield areas and shall not exceed 24 inches. An additional 12 inches of fill above the septic system and drainfield may be allowed for the house pad to ensure adequate flow from the building to the septic system.
 - (b) In the Mainland Stormwater Management Zone when fill is required to raise the lot elevation to the regulatory flood protection elevation.
 - (c) In the Outer Banks Stormwater Management Zone when fill is required to raise the lot elevation to the regulatory flood protection elevation, not to exceed a maximum of three feet.
 - (d) When fill is essential to meet the required building pad elevation as shown on approved construction drawings or stormwater plans.
 - (e) When fill is located at least 100 feet from all lot lines (an alternative stormwater plan shall not be required).
- (4) All fill shall be established at a slope not to exceed 3:1 (three feet horizontal run for every one foot vertical rise). The toe of the slope shall meet the ten-foot setback requirement from all lot lines. A permanent ground cover, sufficient to prevent erosion, must be established on all fill slopes as follows:
 - (a) Prior to issuance of the certificate of occupancy for construction projects; or
 - (b) For projects where land disturbance activity has ceased for more than six months, whichever occurs first.
- (5) Bulkheads or retaining walls shall not be allowed as a method to stabilize or contain fill, except for the purposes of shoreline protection, septic repair, and as otherwise permitted by the County Engineer. This shall not include retaining

walls used to stabilize or contain existing natural grade when a driveway or walkway is cut into a lot at an elevation lower than existing natural grade.

- (6) Any lot subject to filling shall install erosion and sediment control measures to prevent sediment from leaving the site. The erosion and sediment control measures shall be implemented on the site prior to the commencement of land disturbing activities and shall be continuously maintained during the land disturbance phase of development.
- (7) A fill permit issued by the North Carolina Division of Water Quality shall be required to fill any 401 wetlands.
- (8) A fill permit issued by the U.S. Army Corp of Engineers shall be required to fill any 404 wetlands.

D. Maintenance Requirements

- (1) The subdivider or developer shall be responsible for the maintenance of stormwater management devices until maintenance responsibility is transferred to a landowner, homeowners or property owners association.
- (2) Stormwater management devices shall be maintained in accordance with the standards of this section, the Currituck County Stormwater Manual, and approved stormwater plans.
- (3) The landowner, homeowners or property owners association shall perform routine maintenance inspections of stormwater management devices using the Inspection Checklist included in the Currituck County Stormwater Manual.
 - (a) Stormwater management devices that receive runoff from less than five acres shall be inspected at least once every three years.
 - (b) Stormwater management devices that receive runoff from more than five acres shall be inspected annually by a registered engineer, licensed surveyor or landscape architect.
- (4) The Director may request copies of inspection checklists or conduct inspections of stormwater management devices in accordance with Section 9.5.3, Inspections. Failure to maintain stormwater management devices is a violation of this Ordinance subject to the remedies and penalties in Chapter 9: Enforcement.

7.3.5. Alternative Stormwater Plans

A. General

The County Engineer is authorized to approve an alternative stormwater plan for development that proposes to deviate from the standards of this section. The alternative plan shall certify that the proposed development provides equal or better performance as required by these standards and will not create flooding or nuisance conditions on adjacent lots. The Currituck County Stormwater Manual includes additional information and plan requirements for persons submitting alternative stormwater plans for review under the standards of this section.

B. Allowable Deviations

(1) Increased Lot Coverage

A maximum 15 percent increase in lot coverage may be allowed for single-family detached and duplex dwellings on lots in subdivisions that have a state permitted and functional stormwater management system that specifies allowable lot

coverage, or for a single-family detached or duplex dwelling on an individual lot that implements adequate stormwater practices to capture and infiltrate stormwater runoff from all impervious surfaces from the first four inches of rain from any rainfall event.

(2) Reduced Stormwater Detention Requirements

Development subject to the standards in Section 7.3.4.B may reduce the design capacity of required stormwater management devices provided:

- (a)** An Alternative Stormwater Runoff Storage Analysis demonstrates the on-site soils have adequate storage capacity to capture and infiltrate stormwater runoff from all impervious surfaces; or
- (b)** An Alternative Downstream Drainage Capacity Analysis demonstrates the downstream drainage capacity exceeds the pre-development discharge rate from the 24-hour storm event with a 2-year recurrence interval based on pre-development conditions from a wooded site.

(3) Additional Fill or Land Disturbance Activities

A lot may be filled or graded higher than the average adjacent grade of the first 30 feet of adjoining property or to improve drainage for performance of stormwater management devices, provided adequate stormwater practices are implemented to capture and infiltrate stormwater runoff from all impervious surfaces from the first four inches of rain from any rainfall event.

(4) Low Impact Development

The use of low impact development techniques, including but not limited to pervious pavements, cisterns, green roofs, and bio-retention islands may be used to reduce stormwater detention requirements or lower impervious surface percentages.

7.4. FLOOD DAMAGE PREVENTION

7.4.1. Purpose and Intent

The purpose and intent of the flood damage prevention standards is to promote public health, safety, and general welfare and to minimize public and private losses due to flood conditions within flood prone areas by provisions designed to:

- A.** Restrict or prohibit uses that are dangerous to health, safety, and property due to water or erosion hazards or that result in damaging increases in erosion, flood heights, or velocities;
- B.** Require that uses vulnerable to floods be protected against flood damage at the time of initial construction;

- C.** Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
- D.** Control filling, grading, dredging, and all other development that may increase erosion or flood damage; and
- E.** Prevent or regulate the construction of flood barriers that will unnaturally divert flood waters or which may increase flood hazards to other lands.

7.4.2. Applicability

The standards in this section shall apply to all lands within the special flood hazard area, as depicted in the Digital Flood Insurance Rate Maps (DFIRM) for Currituck County and incorporated by reference into this Ordinance.

7.4.3. Floodplain Development Permit Required

- A.** Development subject to the standards in this section shall obtain a floodplain development permit (see Section 2.4.12) prior to the commencement of any development activities.
- B.** Development subject to these standards shall not be established, extended, converted, altered, or occupied in any way without full compliance with the requirements of this section.

7.4.4. Special Flood Hazard Area Zones

All lands within the Currituck County special flood hazard area are located within one of four different special flood hazard area zones, as depicted on the county's FIRM maps. Each flood zone is a geographic area in the county subject to a unique type and severity of flood. Each flood zone has unique standards, elevation certificate requirements, or both. Applicants for development within the special flood hazard area should consult the FIRM to determine the applicable flood zone where their land is located. The different flood zones are described below.

A. VE Zone

Lands within a VE zone are areas generally adjacent to a body of water that may experience flooding as well as wave action. Lands in a VE zone are subject to the coastal high hazard zone standards in addition to the general flood damage prevention standards in Section 7.4.6, Standards.

B. AE Zone

Lands within AE zone are areas that may experience flooding, but no wave action. The FIRM maps indicate a base flood elevation in this zone below which habitable residential space is prohibited.

C. A Zone (No Base Flood Elevation)

Lands within A zones are areas that may be subject to flooding, but not subject to wave action during a storm event. Lands in an A Zone are subject to the standards for floodplains without established base flood elevations in addition to general flood damage prevention standards in Section 7.4.6, Standards.

D. AEFW Zone (Floodway)

Lands within the AEFW zone are areas adjacent to a river or stream that are located within a floodway or other non-encroachment area. Areas within the AEFW may or may not have an established base flood elevation depicted on the FIRM map, and are

subject to the standards in Section 7.4.6.C, or 7.4.6.D, (as appropriate) as well as the general flood damage prevention standards in Section 7.4.6.A, General Standards.

7.4.5. Flood Certificates / Certifications

All development within a special flood hazard area shall obtain all required flood certificates or certifications in accordance with this section and Table 7.4.5, Flood Certificates.

TABLE 7.4.5: FLOOD CERTIFICATES

CERTIFICATE TYPE	TYPE OF DEVELOPMENT SUBJECT TO REQUIREMENT	FLOOD ZONE WHERE REQUIRED	TIMING
Elevation Certificate	All residential and nonresidential development [1]	A, AE, VE, AEFW [3]	Under Construction- Prior to scheduling rough in inspection; Finished Construction – Prior to scheduling final inspection
Floodproofing Certificate	All nonresidential development with floor area regulatory flood protection elevation [1] [2]		Design Elevation – Prior to issuance of floodplain development permit; Finished Construction- Prior to scheduling final inspection
Foundation Certification	Manufactured home with chassis 36 inches or more above grade	A, AE	Prior to issuance of flood plain development permit
Watercourse Alteration Certification	Development seeking to alter or relocate a watercourse	A, AE, AEFW, VE	Prior to issuance of floodplain development permit
V-Zone Certificate	All residential and nonresidential development	VE	Prior to issuance of floodplain development permit

NOTES:

[1] Recreation vehicles, temporary structures, and accessory structures less than 150 square feet in area in the A and AE flood zones must comply with the standards of this section, but are exempted from elevation and flood-proofing certificate requirements

[2] Development subject to a floodproofing certificate is not required to obtain an elevation certificate

[3] Floodproofing is not permitted within the VE zone

A. Elevation Certificate (FEMA Form 086-0-33)

(1) Building Under Construction

- (a)** Prior to scheduling rough in inspection, the applicant shall submit a certification of the elevation of the reference level, in relation to NAVD 1988 to the Director.
- (b)** The Director shall review the certificate and note any errors. Errors shall be corrected prior to further work proceeding. Any work done prior to submission of the reference level certification shall be at the applicant's risk.
- (c)** Failure to submit the certification or make required corrections shall result in issuance of a stop-work order for the development.

(2) Finished Construction

- (a)** Prior to scheduling final inspection, the applicant shall submit a finished construction certification of the elevation of the reference level and all

associated utilities to the Director. The Director shall review the certificate and note any errors.

- (b) Errors shall be corrected by the permit holder prior to occupancy of the building. In some instances, an additional certification may be required to certify the corrected as-built construction.
- (c) Failure to submit the certification or make required corrections shall delay occupancy of the building.
- (d) The finished construction certification shall include at least 2 photographs showing the front and rear of the building taken within 90 days of the date of certification. The photographs shall confirm the building description and diagram number provided on the FEMA form. The photographs shall be in color and measure at least 3" x 3".

B. Flood-Proofing Certificate (FEMA Form 086-0-34)

(1) Design Elevation

- (a) Applicants for new nonresidential development employing floodproofing to meet regulatory flood protection elevation requirements within a special flood hazard area shall submit a certification of the floodproofed design elevation, in relation to NAVD 1988, with supporting data, an operational plan, and an inspection and maintenance plan, to the Director prior to issuance of a Floodplain Development Permit.
- (b) The certification of the floodproofed design elevation of the reference level and all attendant utilities in relation to NAVD 1988 shall be prepared by a professional engineer or architect.
- (c) The Director shall review the certificate, operational plan, and inspection and maintenance plan and note any errors.
- (d) Errors shall be corrected by the applicant prior to issuance of a Floodplain Development Permit.
- (e) Failure to submit the certification or make required corrections shall result in denial of a floodplain development permit application.
- (f) Failure to construct in accordance with the certified design shall be cause to withhold the issuance of a certificate of compliance.

(2) Finished Construction

Prior to scheduling a final inspection, the applicant shall submit a finished construction floodproofing certificate with supporting data, operational plan, and inspection and maintenance plan to the Director.

C. Foundation Certification

If a manufactured home is placed within A or AE flood zones, and the elevation of the chassis is more than 36 inches in height above grade, an engineered foundation certification shall be required prior to issuance of a building permit in accordance with the standards of Section 7.4.6.A.4, Manufactured Homes.

D. Watercourse Alteration Certification (No-Rise)

Relocation or alteration of a watercourse shall require submittal of a map showing the location of the proposed watercourse alteration or relocation, description of the extent, and a certified report from a professional engineer on the effects of the proposed

project on the flood-carrying capacity of the watercourse and the effects to properties located both upstream and downstream.

E. V-Zone Certificate

- (1)** Applicants for new development within coastal high hazard area (VE zone) shall submit a V-Zone certificate, prepared by a professional engineer or architect, with accompanying design plans and specifications, demonstrating the standards of this subsection are met prior to issuance of a floodplain development permit.
- (2)** Development within coastal high hazard areas shall also be required to provide an elevation certificate in accordance with subsection (A) above, where applicable.

7.4.6. Standards

A. General Standards

(I) Standards Applied to All Development

- (a)** All new construction and substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse, and lateral movement of the structure.
- (b)** All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage in accordance with the current Technical Bulletin 2, Flood Damage-Resistant Materials Requirements, and available from the Federal Emergency Management Agency.
- (c)** All new construction and substantial improvements shall be constructed by methods and practices that minimize flood damages.
- (d)** Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding to regulatory flood protection elevation. These include, but are not limited to, HVAC equipment, water softener units, bath/kitchen fixtures, ductwork, electric/gas meter panels/boxes, utility/cable boxes, hot water heaters, and electric outlets/switches.
- (e)** All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
- (f)** New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into flood waters.
- (g)** On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
- (h)** Nothing in this Ordinance shall prevent the repair, reconstruction, or replacement of a building or structure existing on January 1, 2013 and located totally or partially within the floodway, non-encroachment area, or stream setback, provided there is no additional encroachment below the regulatory flood protection elevation in the floodway, non-encroachment area, or stream setback, and provided that such repair, reconstruction, or replacement meets all of the other requirements of this Ordinance.
- (i)** All developments shall be consistent with the need to minimize flood damage.

- (j) All developments shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.
- (k) All developments shall have adequate drainage provided to reduce exposure to flood hazards.
- (l) All developments shall have received all necessary permits required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334.
- (m) When a new structure is partially located in the special flood hazard area, the entire structure shall meet the requirements in this section.
- (n) When a structure is located in multiple flood zones or in a flood zone with multiple base flood elevations, the provisions for the more restrictive flood zone and the highest base flood elevation shall apply.
- (o) New solid waste facilities and sites, hazardous waste management facilities, salvage yards, and chemical storage facilities shall not be permitted, except by variance as specified in Section 2.4.14.F, Variance from Flood Protection Standards. A structure or tank for chemical or fuel storage incidental to an allowed use or to the operation of a water treatment plant or wastewater treatment facility may be located in a special flood hazard area only if the structure or tank is either elevated or floodproofed to at least the regulatory flood protection elevation and certified in accordance with the standards of this ordinance.

(2) Residential Development

In addition to the general standards applied to all development in (1) above, new construction and substantial improvement of any residential structure (including manufactured homes) shall have the reference level, including basement, elevated no lower than the regulatory flood protection elevation.

(3) Nonresidential Development

- (a) In addition to the general standards applied to all development in (1) above, new construction and substantial improvement of any commercial, industrial, or other non-residential structure shall have the reference level, including basement, elevated no lower than the regulatory flood protection elevation.
- (b) Structures located in A or AE flood zones may be floodproofed to the regulatory flood protection elevation in lieu of elevation, provided that all areas of the structure, together with attendant utility and sanitary facilities, below the regulatory flood protection elevation are watertight with walls substantially impermeable to the passage of water, using structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy.
- (c) A professional engineer or architect shall certify that the floodproofing standards of this subsection are satisfied in accordance with Section 7.5.4.B, Flood-Proofing Certificate.

(4) Manufactured Homes

In addition to the general standards applied to all development in (1) above, new and replacement manufactured homes in a special flood hazard area shall:

- (a) Be elevated so that the reference level of the manufactured home is no lower than the regulatory flood protection elevation.
- (b) Be securely anchored to an adequately anchored foundation to resist flotation, collapse, and lateral movement, either by certified engineered foundation system, or in accordance with the most current edition of the State of North Carolina Regulations for Manufactured Homes adopted by the Commissioner of Insurance pursuant to NCGS 143-143.15.
- (c) Be supported by reinforced piers or an engineered foundation when the chassis is elevated 36 inches or less above grade.
- (d) Be subject to a foundation certification (see Section 7.4.5) when the chassis is elevated more than 36 inches above grade.
- (e) Ensure all enclosures or skirting below the lowest floor meet the requirements of Section 7.4.6.A.8, Elevated Buildings.
- (f) Be subject to an evacuation plan approved by the Director and the county's Emergency Management Coordinator if located within a new, substantially improved, or substantially damaged manufactured home park or subdivision.

(5) Accessory Structures

In addition to the general standards applied to all development in (1) above, accessory structures (sheds, detached garages, etc.) in the special flood hazard area shall comply with the following standards:

- (a) Portions of an accessory structure below the regulatory flood protection elevation shall not be used for human habitation (including working, sleeping, living, cooking or restroom areas);
- (b) Portions of an accessory structure below the regulatory flood protection elevation shall not be temperature-controlled;
- (c) Accessory structures shall be designed to have low flood damage potential;
- (d) Accessory structures shall be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters;
- (e) Accessory structures shall be firmly anchored to prevent flotation, collapse, and lateral movement;
- (f) All service facilities, such as electrical service, shall be installed to prevent water from entering or accumulating within the components; and
- (g) Flood openings to facilitate automatic equalization of hydrostatic flood forces shall be provided below the regulatory flood protection elevation (see Section 7.4.6.A.8, Elevated Buildings).

(6) Temporary Nonresidential Structures

Prior to the issuance of a floodplain development permit for a temporary nonresidential structure in the special flood hazard area, the applicant shall submit a plan for the removal of the structure(s) in the event of a hurricane, flash flood, or other type of flood warning notification that includes the following:

- (a) The name, address, and phone number of the individual responsible for the removal of the temporary structure;

- (b) The time frame prior to the event at which a structure will be removed (i.e., minimum of 72 hours before landfall of a hurricane or immediately upon flood warning notification);
- (c) A copy of the contract or other suitable instrument with the entity responsible for physical removal of the structure; and
- (d) The location outside the special flood hazard area where the temporary structure will be moved.
- (e) A specified time period for which the temporary use will be permitted. Time specified may not exceed three months, renewable up to one year.

(7) Recreational Vehicles

Recreational vehicles shall:

- (a) Be on site for fewer than 90 consecutive days, be fully licensed, and ready for highway use (i.e., be on its wheels or jacking system, be attached to the site only by quick disconnect type utilities, and have no permanently attached additions); or
- (b) Meet the requirements in this section for new residential construction.

(8) Elevated Buildings

Any fully enclosed area of new construction or substantially improved structure which is below the lowest floor shall:

- (a) Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises;
- (b) Be served by access that is the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator);
- (c) Not be finished or partitioned into separate rooms, except to enclose storage areas;
- (d) Be constructed entirely of flood resistant materials, in accordance with Technical Bulletin 2: Flood Damage Resistant Materials Requirements, at least to the regulatory flood protection elevation;
- (e) Include flood openings, when located in the A and AE flood zones, that automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this standard, the openings must either be certified by a professional engineer or architect to meet or exceed the following minimum design criteria:
 - (i) A minimum of two flood openings on different sides of each enclosed area subject to flooding;
 - (ii) The total net area of all flood openings must be at least one square inch for each square foot of enclosed area subject to flooding;
 - (iii) If a building has more than one enclosed area, each enclosed area must have flood openings to allow floodwaters to automatically enter and exit;
 - (iv) The bottom of all required flood openings shall be no higher than one foot above the adjacent grade;

- (v) Flood openings may be equipped with screens, louvers, or other coverings or devices, provided they permit the automatic flow of floodwaters in both directions; and,
 - (vi) Enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require flood openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires flood openings as outlined above; and
- (f) Be either free of obstruction or constructed with breakaway walls, open wood latticework, or insect screening, when located in a VE zone. To meet this standard, breakaway walls shall not be part of the structural support of the building and be designed so as to breakaway, under abnormally high tides or wave action without causing damage to the elevated portion of the building or supporting foundation system or otherwise jeopardizing the structural integrity of the building, in accordance with the following:
- (i) Design safe loading resistance shall be not less than 10 nor more than 20 pounds per square foot; or
 - (ii) Breakaway walls that exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by State or local codes) shall be certified by a registered professional engineer or architect that the breakaway wall will collapse from a water load less than that which would occur during the base flood event, and the elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and non-structural). The water loading values used shall be those associated with the base flood. The wind loading values used shall be those required by the North Carolina State Building Code.

(9) Additions or Improvements to Existing Buildings

Repairs, additions, or alterations to an existing building in the special flood hazard area shall be subject to the following standards:

(a) Substantial Additions or Improvements

(i) Pre-FIRM Buildings

- (A) A substantial improvement with improvements to the existing structure or the common wall is structurally modified more than installing a doorway, both the existing structure and the addition must comply with the standards for new construction.
- (B) An addition that is a substantial improvement with no modification to the existing structure other than a standard door in the common wall, shall require only the addition to comply with the standards for new construction.

(ii) Post-FIRM Building Additions

- (A) Improvements qualifying as substantial improvements or alterations that worsen an existing nonconformity must comply with the standards for new construction.
- (B) An addition that is a substantial improvement with no modification to the existing structure other than a standard door in the common wall, shall require only the addition to comply with the standards for new construction.

(b) Non-Substantial Additions or Improvements

(i) Pre-FIRM Buildings

Additions or improvements to a portion of a pre-FIRM building that are not substantial are not required to comply with the standards in Section 7.4.6, Standards, but must be designed to minimize flood damage and shall not worsen any existing nonconformities with respect to the building's compliance with the flood damage prevention standards.

(ii) Post-FIRM Building Improvements

All additions to post-FIRM buildings shall comply with the standards for new construction.

(c) Timing of Post-FIRM Structures

Development having a start of construction date of November 4, 1984 shall be considered as a post-FIRM structure for the purposes of these standards.

(10) Tanks

Gas and liquid storage tanks located in the special flood hazard area shall comply with the following standards:

(a) Underground Tanks

- (i) Underground tanks shall be anchored to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads during conditions of the design flood, including the efforts of buoyance assuming the tank is empty.

(b) Above-ground Tanks

- (i) Above-ground tanks shall be elevated to or above the regulatory flood protection elevation on a supporting structure that is designed to prevent flotation, collapse, or lateral movement during conditions of the design flood. Tank supporting structures shall meet the foundation requirements of the applicable flood hazard area.
- (ii) Above-ground tanks that do not meet the elevation requirements of Section 7.4.6.A.(3) Non-Residential Development, shall be permitted in flood hazard areas provided the tanks are designed, constructed, installed, and anchored to resist all flood related and other loads, including the efforts of buoyancy, during conditions of the design flood and without

release of contents in the floodwaters or infiltration by floodwaters into the tanks. Tanks shall be designed, constructed, installed, and anchored to resist the potential buoyant and other flood forces acting on an empty tank during design flood conditions.

(c) Tank Inlets, Fill Openings, Outlets and Vents

Tank inlets, fill openings, outlets, and vents shall be:

- (i)** Installed at or above the regulatory flood protection elevation or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the design flood; and,
- (ii)** Anchored to prevent lateral movement resulting from hydrodynamic and hydrostatic loads, including efforts of buoyancy, during conditions of the design flood.

(II) Other Development

- (a)** Fences that have the potential to block the passage of floodwaters, such as stockade fences and wire mesh fences, shall comply with the standards in Section 7.4.6.D., Standards for Floodways and Non-Encroachment Areas.
- (b)** Retaining walls, sidewalks, and driveways in regulated floodways and non-encroachment areas that include the placement of fill shall comply with the standards in Section 7.4.6.D., Standards for Floodways and Non-Encroachment Areas.
- (c)** Roads and watercourse crossing, including bridges, culverts, low-water crossings, and similar means for vehicles or pedestrians to travel from one side of the water course to the other that encroach into regulated floodways shall meet the standards in Section 7.4.6.D., Standards for Floodways and Non-Encroachment Areas.

B. Standards for Coastal High Hazard Areas (VE Zones)

VE flood zones have special flood hazards associated with high velocity waters from storm surges or seismic activity and, therefore, all new construction and substantial improvements or alterations shall comply with the standards in Section 7.4.6.A, General Standards, and the following requirements:

(1) CAMA Setbacks

Development shall comply with all applicable CAMA setback requirements, including a location landward of the mean high tideline and the first line of stable natural vegetation;

(2) Base Flood Elevation

Development shall be elevated so that the bottom of the lowest horizontal structural member of the lowest floor (excluding pilings or columns) is no lower than the regulatory flood protection elevation (floodproofing shall not be utilized on any structures in the VE zone);

(3) Free of Obstruction

Development shall ensure the space below the lowest floor remains free of obstruction so as not to impede the flow of flood waters, with the following exceptions:

- (a) Open wood latticework or insect screening below the lowest floor for aesthetic purposes only provided it is designed to wash away in the event of abnormal wave action;
- (b) Breakaway walls, provided they comply with the standards in Section 7.4.6.A.8, Elevated Buildings; or
- (c) Development constructed at grade when the grade elevation exceeds the applicable regulatory flood protection elevation, provided it utilizes grade-beam or pile-supported slab construction.

(4) Foundations

- (a) Development shall be securely anchored to pile or column foundations. All pilings and columns and the structure attached thereto shall be anchored to resist flotation, collapse, and lateral movement due to the effect of wind and water loads acting simultaneously on all building components.
- (b) A registered professional engineer or architect shall certify that the design, specifications and plans for construction are in compliance with the standards in this section.
- (c) In determining the load calculations:
 - (i) Water loading values used shall be those associated with the base flood.
 - (ii) Wind loading values used shall be those required by the current edition of the North Carolina State Building Code.

(5) Non-Structural Fill and Grading

- (a) Fill shall not be used for structural support. Minor grading and placement of minor quantities of non-structural fill may be permitted for landscaping and drainage under and around buildings; and for support of parking slabs, pool decks, patios, and walkways.
- (b) Fill material must be similar and consistent with natural soils in the area.
- (c) Site compatible and non-structural fill located under or around an elevated building is limited to two feet. Fill greater than two feet shall include an analysis prepared by a qualified registered design professional demonstrating no harmful diversion of floodwaters or wave run-up and wave deflection that would increase damage to adjacent elevated buildings and structures.
- (d) Non-structural fill slopes steeper than five units horizontal and one unit vertical shall include an analysis prepared by a qualified registered design professional demonstrating no harmful diversion of floodwaters or wave run-up and wave deflection that would increase damage to adjacent elevated buildings and structures.

(6) Alteration of Dunes

There shall be no alteration of sand dunes which would increase potential flood damage.

(7) Concrete Pads

Concrete pads, including patios, decks, parking pads, walkways, driveways and pool decks shall comply with the following standards:

- (a) Be structurally independent of the primary structural foundation and shall not adversely affect structures through redirection of floodwaters or debris;
- (b) Be constructed to breakaway cleanly during design flood conditions, be frangible, and not produce debris capable of causing damage to any structure. Concrete installed or scored in small segments (i.e. 4'x4') that will easily break-up during the base flood event complies with this standard. Reinforcing, including welded wire fabric, shall not be used in order to minimize the potential concrete pad being a source of debris; and,
- (c) Pad thickness shall not exceed 4 inches; or
- (d) Provide a registered design professional's certification stating that the alternate design and method of construction to be used meets the applicable standards of this section.

(8) Swimming Pools and Spas

- (a) Swimming pools and spas shall be designed to withstand all flood related loads, load combinations, and comply with the following standards:
 - (i) Be elevated so that the lowest horizontal structural member is elevated above the regulatory flood protection elevation; or
 - (ii) Be designed and constructed to break away during design flood conditions without producing debris capable of causing damage to another structure; or
 - (iii) Be sited to remain in the ground during design flood conditions without obstructing flow that results in damage to any structure.
- (b) A registered professional engineer or architect shall certify that a pool or spa beneath or near a VE zone building will not be subject to flotation or displacement that will damage building foundations or elevated portions of the building or any nearby buildings during a coastal flood.
- (c) Pool equipment shall be located above the regulatory flood protection elevation whenever practicable. Pool equipment shall not be located beneath an elevated structure.

(9) Elevators and Lifts

- (a) Elevators, vertical platform lifts and chair lifts shall be designed to withstand hydrodynamic and hydrostatic forces as well as erosion, scour and waves.
- (b) Equipment shall not be mounted on, pass through, or be located along breakaway walls.
- (c) Equipment shall be elevated above the regulatory flood protection elevation or constructed using flood damage resistant components.
- (d) Shafts and enclosures that extend below the regulatory flood protection elevation shall be constructed of reinforced masonry block or reinforced concrete walls and located on the landward side of the

building to provide increased protection from flood damage. Drainage shall be provided for the elevator pit.

- (e) Flood damage resistant materials can be used inside and outside the elevator cab to reduce flood damage. Use only stainless steel doors and door frames below the RFPE. Grouting the door frame and sills is recommended.
- (f) Elevators designed to provide access to areas below the RFPE shall be equipped with a float switch system that will activate during a flood to send the elevator cab to a floor above the regulatory flood protection elevation.

(10) Decks and Patios

- (a) A deck structurally attached to a building or structure shall be elevated so that the bottom of the lowest horizontal structural member is no lower than the regulatory flood protection elevation. Supporting members that extend below the regulatory flood protection elevation shall comply with the foundation requirements that apply to the building or structure, which shall be designed to accommodate increased loads resulting from the attached deck. The increased loads must be considered in the design of the primary structure and included in the V-Zone Certificate required in Section 7.4.5., Flood Certificates/Certifications.
- (b) A deck or patio located below the regulatory flood protection elevation shall:
 - (i) Be structurally independent from buildings or structures and their foundation system; and,
 - (ii) Be designed and constructed either to remain intact and in place during design flood conditions or break apart into small pieces to minimize debris during flooding that is capable of causing structural damage to the building or structure or adjacent buildings and structures.

(11) Other Development

- (a) No manufactured homes shall be permitted in the coastal high hazard flood zone, except for replacement manufactured homes located in existing manufactured home parks and subdivisions permitted by this ordinance subject to the standards in Section 7.4.6.A.4.
- (b) Recreational vehicles are permitted in the coastal high hazard flood zone, subject to the standards in Section 7.4.6.A.7, Recreational Vehicles.
- (c) No more than four electrical outlets and no more than four electrical switches may be permitted below the regulatory flood protection elevation unless required by the building code.
- (d) Development activities, other than buildings and structures, shall be permitted only if authorized by the appropriate state or local authority; if located outside the footprint of, and not structurally attached to, buildings and structures; and if analyses prepared by a qualified registered design professional to demonstrate no harmful diversion of floodwaters or wave run-up and wave reflection that would increase

damage to adjacent buildings and structures. Such development activities include but are not limited to:

- (i) Bulkheads, seawalls, retaining walls, revetments or similar erosion control structures; and,
- (ii) Solid fences and privacy walls, and fences prone to trapping debris unless designed and constructed to fail under flood conditions less than the design flood or otherwise function to avoid obstruction of floodwaters.

C. Standards for Floodplains without Established Base Flood Elevations

The following standards shall apply to all development within A Flood zones where no base flood elevation data has been provided by FEMA:

- (1) The standards in Section 7.4.6.A.1, Standards Applied to All Development.
- (2) No encroachments, including fill, new construction, substantial improvements or new development shall be permitted within an area located 20 feet from top of a stream bank or five times the width of the stream, whichever is greater, unless a professional engineer certifies the encroachment shall not increase flood levels during the occurrence of the base flood discharge.
- (3) The base flood elevation used in determining the minimum regulatory flood protection elevation shall be determined based on the following:
 - (a) When base flood elevation data is available from other sources, all new construction and substantial improvements within such areas shall also comply with all applicable provisions of this Ordinance and shall be elevated or floodproofed in accordance with standards in Section 7.4.6.A, General Standards.
 - (b) When floodway or non-encroachment data is available from a Federal, State, or other source, all new construction and substantial improvements within floodway and non-encroachment areas shall also comply with the requirements in Sections 7.4.6.A.2-9, and 7.4.6.D, Standards for Floodways and Non-encroachment Areas.
 - (c) All development of more than five acres, 50 lots, or 50 dwelling units shall provide base flood elevation data that will be used in implementing these standards.

D. Standards for Floodways and Non-encroachment Areas

Areas designated as floodways or non-encroachment can be extremely hazardous areas due to the velocity of floodwaters that have erosion potential and carry debris and potential projectiles. Development within these areas shall comply with the following standards:

- (1) The standards in Section 7.4, Flood Damage Prevention, all other applicable standards in this ordinance, and the Currituck County Administrative Manual;
- (2) No encroachments, including fill, new construction, substantial improvements and other developments shall be permitted unless:
 - (a) It is demonstrated that the proposed encroachment would not result in any increase in the flood levels during the occurrence of the base flood, based on hydrologic and hydraulic analyses performed in accordance with standard engineering practice and presented prior to issuance of floodplain development permit; or

- (b) A Conditional Letter of Map Revision (CLOMR) has been approved by FEMA. A Letter of Map Revision (LOMR) must also be obtained upon completion of the proposed encroachment.

E. Standards for Riverine Floodplains without Established Floodways or Non-encroachment Areas

All development along rivers and streams where base flood elevation data is available but floodway and non-encroachment areas are not identified on the FIRM or in the FIS report, shall comply with the following standards:

- (1) The standards in Section 7.4.6.A, General Standards;
- (2) No encroachments, including fill, new construction, substantial improvements, or other development, shall be permitted until:
 - (a) A regulatory floodway or non-encroachment area is designated; or
 - (b) Certification is provided by a registered professional engineer that the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

7.5. SEDIMENTATION AND EROSION CONTROL

7.5.1. Approval by the NC Sedimentation Control Commission

- A. No zoning compliance permit, special use permit, or final plat approval shall be given to development that requires approval of an erosion and sedimentation control plan by the NC Sedimentation Control Commission unless the commission certifies that:
 - (1) An erosion and sedimentation control plan has been submitted to and approved by the Commission; or
 - (2) The Commission has examined the preliminary plans for the development and believes that an erosion and sedimentation control plan can be approved upon submission by the developer of more detailed construction or design drawings. However, building permits shall not be issued and construction shall not commence until the Commission approves the erosion and sedimentation control plan.

7.5.2. Definition of Terms

- A. For purposes of this section, "land disturbing activity" means any residential, commercial, industrial, or institutional use of land, or highway and road construction or maintenance that results in a change in the natural grade or that may cause or contribute to sedimentation, except activities that are exempt under Section 113A-52(6) of the North Carolina General Statutes.
- B. For the purposes of this section "sedimentation" means transportation of solid particulate matter, mineral or organic, by water, air, gravity, or ice from the site of its origin.

7.6. RIPARIAN BUFFERS

7.6.1. Purpose and Intent

The purpose for these standards is to establish a riparian buffer around the county's surface waters, estuarine systems, and wetlands to ensure surface water runoff does not degrade or contaminate water quality in these resources. More specifically, these standards are intended to:

- A.** Establish a riparian buffer zone around key water resources;
- B.** Protect private on-site drinking water supplies;
- C.** Trap sediment and other pollutants in surface runoff;
- D.** Promote shoreline stabilization;
- E.** Protect wildlife habitat and critical aquatic nurseries; and
- F.** Minimize the impacts of floods by helping maintain flood water storage volume.

7.6.2. Applicability

These standards shall be applied to all new major subdivisions, planned developments, and site plans on lots ten acres or greater in area.

7.6.3. Establishment of Buffer

Excluding man-made ponds and man-made ditches, all surface waters (e.g., sounds, creeks, bays, rivers, streams, etc.), estuarine waters, wetlands, and canals shall maintain a thirty-foot-wide riparian buffer directly adjacent to the shoreline, average annual water edge, or impoundment edge, or wetland boundary.

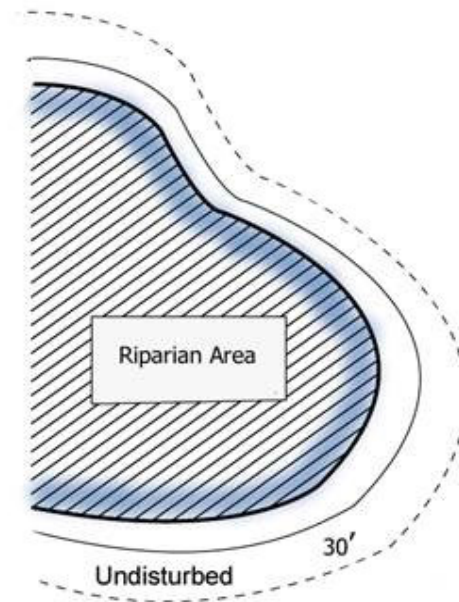
7.6.4. Delineation of Buffer Zones

Riparian buffers shall be measured horizontally from the edge of the shoreline, impoundment edge, average annual water edge, or wetland boundary (see Figure 7.6.4, Riparian Buffer Zones).

A. Zone I

Zone I is located within the first 30 feet of the bank, impoundment, water edge, or boundary and shall prohibit all development and land-disturbing activity except as allowed in Section 7.6.5, Development within Buffer.

Figure 7.6.4, Riparian Buffer Zones



7.6.5. Development Within Buffer

The following forms of development shall be authorized within zone I of a riparian buffer:

- A.** Functionally-dependent facilities;
- B.** Open space set-asides;
- C.** Walkways and boardwalks;
- D.** Recreational facilities, including gazebos and seating areas;
- E.** Utilities, when no practical alternative exists;
- F.** Street crossings; and
- G.** Minor vegetative drainage conveyance connections to existing drainage outlets where no feasible alternative exists.

7.6.6. Depiction of Buffer

Riparian buffers shall be depicted on site plans, preliminary plats, final plats, planned development master plans, and conservation and development plans associated with a conservation subdivision. The above plans shall note the restrictions on the allowable development and land-disturbing activities within the buffer in accordance with this ordinance.

7.6.7. Location of Buffer

- A.** Lots subject to these standards that are proposed adjacent to surface waters (sounds, creeks, bays, streams, etc.) shall contain a riparian buffer that may be located within the boundaries of individual platted lots.
- B.** Lots subject to these standards that are proposed adjacent to wetlands shall contain a riparian buffer that shall not be included within the boundaries of individual platted lots.
- C.** Riparian buffers not located within individual platted lots shall be credited towards open space set-aside requirements in Section 7.1, Open Space Set-Asides.

7.7. PROTECTION OF SIGNIFICANT DUNES

7.7.1. Purpose and Intent

These standards are proposed to limit the impacts of development on the formation and migration of significant sand dunes.

7.7.2. Applicability

These standards are applied to significant sand dunes that are 25 feet or higher above mean sea level.

7.7.3. Standards

The following standards shall apply to development located on a lot or tract containing a significant sand dune.

A. Removal of Sand or Vegetation

No person shall remove sand or existing vegetation from a significant dune, whether in connection with a development or use of the land upon which the significant dune is located.

B. Subdivision

Subdivisions of land containing a significant dune shall be configured so that the significant dune is not located within platted building lot or street right of way. Significant dunes shall be credited towards the open space set-aside standards in Section 7.1, Open Space Set-Asides.

C. Minimum Setbacks

No development shall be located within 50 feet of the toe of the sand dune slope, to the maximum extent practicable.

7.7.4. Development Near Significant Dunes

A. Geologic Analysis Required

No development or use of land containing a significant dune(s) shall occur until the applicant submits a geological analysis from a licensed geologist demonstrating that:

- (1)** No public or private street located near a significant dune is likely to be damaged by erosion or become hazardous due to infiltration of sand; and
- (2)** No development shall impair or be impaired by the natural migration of sand from the significant dune.

B. Undue Restriction

If, after the analysis required in Section (A) above has been submitted, the Director concludes that application of the standards in Section 7.7.3, Standards, unduly restricts the landowner's reasonable use of the land, less restrictive means of preserving the significant dune(s) may be authorized, subject to one or more of the following mitigation:

- (1)** Stabilization of the portions of the dune impacted by development through re-vegetation with native vegetation;

- (2)** Use of sand fencing with a minimum height of four feet to inhibit sand migration due to disturbance;
- (3)** Mechanical excavation of replacement sand, where appropriate;
- (4)** Use of piles and elevation of crossovers or other development at least two feet above the sand dune;
- (5)** Avoidance of storage of equipment, materials, vehicles, or other debris on dune faces; and
- (6)** Any other mitigation technique considered appropriate by the Director.