15A NCAC 07H .0312 TECHNICAL STANDARDS FOR BEACH FILL PROJECTS

Placement of sediment along the oceanfront shoreline is referred to in this Rule as "beach fill." Sediment used solely to establish or strengthen dunes shall conform to the standards contained in 15A NCAC 07H .0308(c). Sediment used to re-establish state-maintained transportation corridors across a barrier island breach in a disaster area as declared by the Governor is not considered a beach fill project under this Rule. Beach fill projects including beach nourishment, dredged material disposal, habitat restoration, storm protection, and erosion control may be permitted under the following conditions:

(1) The applicant shall characterize the recipient beach according to the following methodology. Initial characterizations of the recipient beach shall serve as the baseline for subsequent beach fill projects:

(a) Characterization of the recipient beach is not required for the placement of sediment directly from and completely confined to a cape shoal system, or maintained navigation channel or associated sediment basins within the active nearshore, beach or inlet shoal system. For purposes of this Rule, "cape shoal systems" include Frying Pan Shoals at Cape Fear, Lookout Shoals at Cape Lookout, and Diamond Shoals at Cape Hatteras;

(b) Sediment sampling and analysis shall be used to capture the spatial variability of the sediment characteristics including grain size, sorting and mineralogy within the natural system;

(c) Shore-perpendicular transects shall be established for topographic and bathymetric surveying of the recipient beach. Topographic and bathymetric surveying shall occur along a minimum of five shore-perpendicular transects evenly spaced throughout the entire project area with spacing not to exceed 5,000 feet (1,524 meters) in the shore-parallel direction. Each transect shall extend from the frontal dune crest seaward to a depth of 20 feet (6.1 meters) or to the shore-perpendicular distance 2,400 feet (732 meters) seaward of mean low water, whichever is in a more landward position. Elevation data for all transects shall be compliant with Standards of Practice for Land Surveying in North Carolina pursuant to 21 NCAC 56 .1600. These Rules are hereby incorporated by reference, including subsequent amendments;

(d) Along each transect, at least one sample shall be taken from each of the following morphodynamic zones where present: frontal dune, frontal dune toe, mid berm, mean high water (MHW), mid tide (MT), mean low water (MLW), trough, bar crest and at even depth increments from 6 feet (1.8 meters) to 20 feet (6.1 meters) or to a shore-perpendicular distance 2,400 feet (732 meters) seaward of mean low water, whichever is in a more landward position. The total number of samples taken landward of MLW shall equal the total number of samples taken seaward of MLW;

(e) For the purpose of this Rule, "sediment grain size categories" are defined as "fine" (less than 0.0625 millimeters), "sand" (greater than or equal to 0.0625 millimeters and less than 2 millimeters), "granular" (greater than or equal to 2 millimeters and less than 4.76 millimeters) and "gravel" (greater than or equal to 4.76 millimeters and less than 76 millimeters). Each sediment sample shall report percentage by weight of each of these four grain size categories;

(f) A composite of the simple arithmetic mean for each of the four grain size categories defined in Sub-Item (1)(e) of this Rule shall be calculated for each transect. A grand mean shall be established for each of the four grain size categories by summing the mean for each transect and dividing by the total number of transects. The value that characterizes grain size values for the recipient beach is the grand mean of percentage by weight for each grain size category defined in Sub-Item (1)(e) of this Rule;

(g) Percentage by weight calcium carbonate shall be calculated from a composite of all sediment samples. The value that characterizes the carbonate content of the recipient beach is a grand mean calculated by summing the average percentage by weight calcium carbonate for each transect and dividing by the total number of transects;

(h) The number of sediments greater than or equal to one inch (25.4 millimeters) in diameter, and shell material greater than or equal to three inches (76 millimeters) in diameter shall be differentiated and calculated through visual observation of an area of 10,000 square feet centered on each transect, and between mean tide level (MTL) and the frontal dune toe within the beach fill project boundaries. A simple arithmetic mean shall be calculated

for both sediments and shell by summing the totals for each across all transects and dividing by the total number of transects, and these values shall be considered representative of the entire project area, and referred to as the "background" values for large sediment and large shell material;

(i) Beaches that received sediment prior to the effective date of this Rule shall be characterized in a way that is consistent with Sub-Items (1)(a) through (1)(h) of this Rule and may use data collected from the recipient beach prior to the addition of beach fill where data are available, and in coordination with the Division of Coastal Management; and

(j) All data used to characterize the recipient beach shall be provided in digital and hardcopy format to the Division of Coastal Management upon request.

(2) Characterization of borrow areas is not required if completely confined to a cape shoal system. For the purposes of this Rule, "cape shoal systems" include the Frying Pan Shoals at Cape Fear, Lookout Shoals at Cape Lookout, and Diamond Shoals at Cape Hatteras. The applicant shall characterize the sediment to be placed on the recipient beach according to the following methodology:

(a) The characterization of borrow areas including submarine sites, upland sites, and dredged material disposal areas shall be designed to capture the spatial variability of the sediment characteristics including grain size, sorting and mineralogy within the natural system or dredged material disposal area;

(b) The characterization of borrow sites may include historical sediment characterization data where available and collected using methods consistent with Sub-Items (2)(c) through (2)(g) of this Rule, and in coordination with the Division of Coastal Management.

(c) Seafloor surveys shall measure elevation and capture acoustic imagery of the seafloor. Measurement of seafloor elevation shall cover 100 percent, or the maximum extent practicable as determined in consultation with the Division of Coastal Management, of each submarine borrow site and use survey-grade swath sonar (e.g. multibeam or similar technologies). Seafloor imaging without an elevation component (e.g. sidescan sonar or similar technologies) shall also cover 100 percent, or the maximum extent practicable, of each site. Because shallow submarine areas can provide technical challenges and physical limitations for acoustic measurements, seafloor imaging without an elevation component may not be required for water depths less than 10 feet (3 meters). Alternative elevation surveying methods for water depths less than 10 feet (3 meters) may be evaluated on a case-by-case basis by the Division of Coastal Management. Elevation data shall be tide- and motion-corrected and compliant with Standards of Practice for Land Surveying in North Carolina pursuant to 21 NCAC 56 .1600. Seafloor imaging data without an elevation component shall also be compliant with Standards of Practice for Land Surveying in North Carolina pursuant to 21 NCAC 56 .1600. For offshore dredged material disposal sites, only one set of imagery without elevation is required. Sonar imaging of the seafloor without elevation is also not required for borrow sites completely confined to maintained navigation channels, and for sediment deposition basins within the active nearshore, beach or inlet shoal system;

(d) Geophysical imaging of the seafloor subsurface shall be used to characterize each borrow site. Because shallow submarine areas can pose technical challenges and physical limitations for geophysical techniques, subsurface data may not be required in water depths less than 10 feet (3 meters), and the Division of Coastal Management shall evaluate these areas on a case-by-case basis. Subsurface geophysical imaging shall not be required for borrow sites completely confined to maintained navigation channels, and for sediment deposition basins within the active nearshore, beach or inlet shoal system, or upland sites. All final subsurface geophysical data shall use accurate sediment velocity models for time-depth conversions and be compliant with Standards of Practice for Land Surveying in North Carolina pursuant to 21 NCAC 56 .1600;

(e) With the exception of upland borrow sites, sediment sampling of all borrow sites shall use a vertical sampling device no less than 3 inches (76 millimeters) in diameter. Characterization of each borrow site shall use no fewer than five evenly spaced cores or one core per 23 acres (grid spacing of 1,000 feet or 305 meters), whichever is greater.

Characterization of borrow sites completely confined to maintained navigation channels or sediment deposition basins within the active nearshore, beach or inlet shoal system shall use no fewer than five evenly spaced vertical samples per channel or sediment basin, or sample spacing of no more than 5,000 linear feet (1,524 meters), whichever is greater. Two sets of sampling data (with at least one dredging event in between) from maintained navigation channels or sediment deposition basins within the active nearshore, beach or inlet shoal system, or offshore dredged material disposal site (ODMDS) may be used to characterize material for subsequent nourishment events from those areas if the sampling results are found to be compatible with Sub-Item (3)(a) of this Rule. Vertical sampling shall penetrate to a depth equal to or greater than permitted dredge or excavation depth or expected dredge or excavation depths for pending permit applications. Because shallow submarine areas completely confined to a maintained navigation channel or associated sediment basins within the active nearshore, beach or inlet shoal system can pose technical challenges and physical limitations for vertical sampling techniques, geophysical data of and below the seafloor may not be required in water depths less than 10 feet (3 meters), and shall be evaluated by the Division of Coastal Management on a case-by-case basis;

(f) Grain size distributions shall be reported for all sub-samples taken within each vertical sample for each of the four grain size categories defined in Sub-Item (1)(e) of this Rule. Weighted averages for each core shall be calculated based on the total number of samples and the thickness of each sampled interval. A simple arithmetic mean of the weighted averages for each grain size category shall be calculated to represent the average grain size values for each borrow site. Vertical samples shall be geo-referenced and digitally imaged using scaled, color-calibrated photography;

(g) Percentage by weight of calcium carbonate shall be calculated from a composite sample of each core. A weighted average of calcium carbonate percentage by weight shall be calculated for each borrow site based on the composite sample thickness of each core. Carbonate analysis is not required for sediment confined to maintained navigation channels or associated sediment deposition basins within the active nearshore, beach or inlet shoal system; and

(h) All data used to characterize the borrow site shall be provided in digital and hardcopy format to the Division of Coastal Management.

(3) Compliance with these sediment standards shall be certified by an individual licensed pursuant to Chapter 89C or 89E of the N.C. General Statutes. Sediment compatibility shall be determined according to the following criteria:

(a) Sediment completely confined to the permitted dredge depth of a maintained navigation channel or associated sediment deposition basins within the active nearshore, beach or inlet shoal system shall be considered compatible if the average percentage by weight of fine-grained (less than 0.0625 millimeters) sediment is less than 10 percent;

(b) The average percentage by weight of fine-grained sediment (less than 0.0625 millimeters) in each borrow site shall not exceed the average percentage by weight of fine-grained sediment of the recipient beach characterization plus five percent;

(c) The average percentage by weight of granular sediment (greater than or equal to 2 millimeters and less than 4.76 millimeters) in a borrow site shall not exceed the average percentage by weight of coarse-sand sediment of the recipient beach characterization plus 10 percent;

(d) The average percentage by weight of gravel (greater than or equal to 4.76 millimeters and less than 76 millimeters) in a borrow site shall not exceed the average percentage by weight of gravel-sized sediment for the recipient beach characterization plus five percent;

(e) The average percentage by weight of calcium carbonate in a borrow site shall not exceed the average percentage by weight of calcium carbonate of the recipient beach characterization plus 15 percent; and

(f) Techniques that take incompatible sediment within a borrow site or combination of sites and make it compatible with that of the recipient beach characterization shall be evaluated on a case-by-case basis by the Division of Coastal Management.

(4) Excavation and placement of sediment shall conform to the following criteria:

(a) In order to protect threatened and endangered species, and to minimize impacts to fish, shellfish and wildlife resources, no excavation or placement of sediment shall occur within the project area during any seasonal environmental moratoria designated by the Division of Coastal Management in consultation with other State and Federal agencies, unless specifically approved by the Division of Coastal Management in consultation with other State and Federal agencies. The time limitations shall be established during the permitting process and shall be made known prior to permit issuance; and

(b) The total sediments with a diameter greater than or equal to one inch (25.4 millimeters), and shell material with a diameter greater than or equal to three inches (76 millimeters) is considered incompatible if it has been placed on the beach during the beach fill project, is observed between MTL and the frontal dune toe, and is in excess of twice the background value of material of the same size along any 10,000 square feet section of beach within the beach fill project boundaries. In the event that more than twice the background value of incompatible material is placed on the beach, it shall be the permittee's responsibility to remove the incompatible material in coordination with the Division of Coastal Management and other State and Federal resource agencies.

History Note: *Authority G.S. 113-229; 113A-102(b)(1); 113A-103(5)(a); 113A-107(a); 113A-113(b)(5); 113A-113(b)(6); 113A-118; 113A-124;*
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