15A NCAC 07H .0312 is proposed for readoption as follows:

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 or shall conform to the standards contained in Rule .0308(b) of this Section. 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 characterization 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 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;
   b. Sediment sampling and analysis shall be used to capture the three-dimensional 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 shall be conducted to determine the beach profile. Topographic and bathymetric surveying shall occur along a minimum of five shore-perpendicular transects evenly spaced throughout the entire project area. 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. Transect spacing shall not exceed 5,000 feet (1,524 meters) one half mile in the shore-parallel direction. Elevation data for all transects shall be referenced to the North American Vertical Datum of 1988 (NAVD-88) and the North American Datum of 1983 (NAD 83) direction;
   d. No fewer than 13 sediment samples shall be taken along each beach profile 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 along each transect defined in Sub-Item (1)(d) of this Rule. 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. For beaches on which fill activities have taken place prior to the effective date of this Rule, the Division of Coastal Management shall consider visual estimates of shell content as a proxy for carbonate weight percent;

(h) The total number of sediments and shell material greater than or equal to three inches (76 millimeters) in diameter, observable on the surface of the beach between mean low water (MLW) and the frontal dune toe, shall be calculated for an area of 50,000 square feet (4,645 square meters) within the beach fill project boundaries. This area is considered a representative sample of the entire project area. The total number of sediments shall be calculated through visual observation at each transect within the beach fill project boundaries for an observable three square meter surface area of the beach for each sample point between mean low water (MLW) and the frontal dune toe as defined in Sub-Item (1)(d) of this Rule. A grand mean shall be calculated for all transects and referred to as the "background" value;

(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 shall use data collected from the recipient beach prior to the addition of beach fill. If such data were not collected or are unavailable, a dataset best reflecting the sediment
characteristics of the recipient beach prior to beach fill shall be developed 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
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. 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 three-dimensional 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 shall include sediment characterization data provided
by the Division of Coastal Management where available. These data can be found in
individual project reports and studies, and shall be provided by the Division of Coastal
Management upon request and where available; historical sediment characterization data
collected using methods consistent with Sub-Items (2)(c) through (2)(g) of this Rule;

(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, of each submarine borrow site and use survey-grade swath sonar (e.g. multibeam or similar technologies) in accordance with current US Army Corps of Engineers standards for navigation and dredging 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 borrow site and be performed in accordance with US Army Corps of Engineers standards for navigation and dredging 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 referenced to NAVD 88 and NAD 83. Seafloor imaging data without an elevation component shall be referenced to the NAD 83. All final seafloor survey data shall conform to standards for accuracy, quality control and quality assurance as set forth by the US Army Corps of Engineers (USACE). The current surveying standards for navigation and dredging can be obtained from the Wilmington District of the USACE, US Army Corps of Engineers (USACE). For offshore dredged material disposal sites, only one set of imagery without elevation is required. Sonar
imaging of the seafloor without elevation is not required for borrow sites completely
confined to maintained navigation channels, 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 and shall use survey grids with a line spacing not to exceed 1,000 feet (305 meters).
Offshore dredged material disposal sites shall use a survey grid not to exceed 2,000 feet
(610 meters) and only one set of geophysical imaging of the seafloor subsurface is
required. Survey grids shall incorporate at least one tie point per survey line, 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, 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 referenced to NAD 83;

(e) 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, one core every 23 acres. 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. In submarine
borrow sites other than maintained navigation channels or associated sediment deposition
basins within the active nearshore, beach or inlet shoal system where water depths are no
greater than 10 feet (3 meters), geophysical data of and below the seafloor are not
required, and sediment sample spacing shall be no less than one core per six acres (grid
spacing of 500 feet or 152 meters). 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. All sediment samples shall be integrated with
geophysical data to constrain the surficial, horizontal and vertical extent of lithologie
units and determine excavation volumes of compatible sediment as defined in Item (3) of this Rule; required:

(f) For offshore dredged material disposal sites, the grid spacing shall not exceed 2,000 feet (610 meters). Characterization of material deposited at offshore dredged material disposal sites after the initial characterization are not required if all of the material deposited complies with Sub-Item (3)(a) of this Rule as demonstrated by at least two sets of sampling data with at least one dredging event in between;

(g) 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;

(h) 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

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

(3) The Division of Coastal Management shall determine sediment compatibility 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 is 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 is 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) Sediment excavation depths for all borrow sites shall not exceed the maximum depth of
recovered core at each coring location;

(b) 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 moratoriums 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

(c) Sediment A post-placement grand mean for sediment and shell material with a diameter
greater than or equal to three inches (76 millimeters) shall be re-calculated according to
the methodology described in Sub-Item (1)(h) of this Rule, and is considered
incompatible if it has been placed on the beach during the beach fill project, is observed
between MLW and the frontal dune toe, and is in excess of twice the grand mean
background value of material of the same size along any 50,000 square-foot (4,645
square meter) section of beach, within the boundaries of the beach fill project as
observed, measured and calculated prior to the beach fill project. 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(a); 113A-107(a); 113A-113(b)(5) and (6);
113A-118; 113A-124;
Eff. February 1, 2007;
Amended Eff. August 1, 2014; September 1, 2013; April 1, 2008;