

SEDIMENT QUALITY ASSURANCE/QUALITY CONTROL PLAN

FDEP File No. 0220629-002-JC
Canaveral Harbor Sand Bypassing Project
Permittee: Canaveral Harbor Port Authority

November 2014

A. INTRODUCTION

Pursuant to Fla. Admin. Code r. 62B-41.008 (1) (k) 4.b., permit applications for inlet excavation, beach restoration, or nourishment shall include a quality control/assurance plan that will ensure that the sediment from the borrow areas to be used in the project will meet the standard in Fla. Admin. Code r. 62B-41.007(2)(j). To protect the environmental functions of Florida's beaches, only beach compatible fill shall be placed on the beach or in any associated dune system. Beach compatible fill is material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system.

The project dredges the equivalent of approximately 960,000 cubic yards of sediment every six years from a beach borrow area located between the existing mean high water line and the -19.3 ft, NAVD88 contour and between the north boundary of the Canaveral Harbor Entrance navigation channel and a line parallel and located 8,150 feet north of the main stem of the existing north jetty at reference monument CCAFS 38. The dredged material is placed along the shoreline, between the Canaveral Harbor south jetty and southward for up to 18,600 feet (R1 to R20). The borrow area is immediately updrift of, and contiguous with, the fill area—though separated by the ocean inlet of the Canaveral Harbor Entrance. The Canaveral Harbor Sand Bypassing Project has been constructed multiple times since its inception in 1995. All bypassed sediment was dredged from the active beach profile within the aforementioned permitted borrow area. Post-construction analysis demonstrated that the bypassed sediment is compatible with the existing or native beaches.

This information and the borrow area design provides sufficient quality control/quality assurance (QA/QC) that the mean grain size and carbonate content of the sediment from the borrow area will meet the requirements of Fla. Admin. Code r. 62B-41.007(2)(j); hence, additional QA/QC procedures are not required for these sediment parameters during construction.

This Plan outlines the responsibilities of each stakeholder in the project as they relate to the placement of beach compatible material on the beach. The QC Plan specifies the minimum construction management, inspection and reporting requirements placed on the Marine Dredging Contractor and enforced by the Contracting Officer, to ensure that the sediment from the borrow area to be used in the project meet the compliance specifications. The QA Plan specifies the minimum construction oversight, inspection and reporting requirements to be undertaken by the Contracting Officer to observe, sample, and test the placed sediments to verify the sediments are in compliance.

B. SEDIMENT QUALITY SPECIFICATIONS

The sediment from the borrow area is (a) derived from the existing beach profile and (b) has been placed onto the beach placement site on multiple previous occasions. As such, the fill material is inherently similar in grain size distribution, carbonate content and Munsell color to the material in the existing coastal system at the beach placement site. Previous projects have not encountered objectionable material which falls outside of State standards. Compliance values for fill material parameters are proposed for this project and are listed in **Table 1**.

The compliance specifications take into account the variability of sediment on the native or existing beach, and are values which may reasonably be attained given what is known about the borrow area sediment. Beach fill material which falls outside of these limits will be considered unacceptable and subject to remediation.

Table 1- Sediment Compliance Specifications

Sediment Parameter	Parameter Definition	Compliance Value
Max. Silt Content	passing #230 sieve	≤5%
Max. Shell Content	retained on #4 sieve	≤5%
Max. Carbonate Content		≤60%
Munsell Color Value	moist Value (chroma ≤ 2)	7.5 or 10YR Hue ≥6 Value
Large Whole Shell & Lag Content	retained on ¾" sieve, by weight	≤0.5%
Allowable Median Grain Size		0.13 to 0.40 mm
The beach fill material shall not contain construction debris, toxic material, other foreign matter. The beach fill shall not contain coarse gravel in excess of 50% of background over an aerial extent exceeding 10,000 ft².		

C. QUALITY CONTROL PLAN

The contract documents shall incorporate the following technical requirements, or equivalent language that addresses the location of dredging, sediment quality monitoring on the beach, and, if necessary, remedial actions. The Contracting Officer shall seek to enforce these contract requirements during the execution of work.

1. Electronic Positioning and Dredge Depth Monitoring Equipment. The Contractor shall continuously operate electronic positioning equipment, approved by the Contracting Officer, to monitor the precise positioning of the excavation device location(s) and depth(s). A Differential Global Positioning System (DGPS) or equivalent system providing equal or better accuracy shall be used to determine the horizontal position and shall be interfaced with an appropriate depth measuring device to determine the vertical position of the bottom of the excavation device. The horizontal positioning equipment shall maintain an accuracy of +/- 3.0 feet. The vertical positioning equipment shall maintain a vertical accuracy of +/-0.5 feet with continuous applicable tidal corrections measured at the project site.

2. Dredge Location Control. The Contractor is required to have, in continuous operation on the dredge, electronic positioning equipment that will accurately compute and plot the position of the dredge. Such fixes, and the accompanying plots, shall be furnished to the Contracting Officer daily as part of the QC Reports. The electronic positioning equipment shall be installed on the dredge so as to monitor, as closely as possible, the actual location of the excavation device(s). The location of the master antenna on the dredge and the distance and direction from the master antenna to the bottom of the excavation device shall be reported on the Daily Reports. A file of the excavation device positions in State Plane Coordinates, the excavation device depths corrected for tide elevation and referenced to the North American Vertical Datum of 1988 (NAVD 88) and the time, shall be maintained using an interval of two (2) minutes for each fix. A computer file (in ASCII format) copy of the position data shall be provided to the Contracting Officer as part of the daily report. The Contractor shall prepare a plot of the data that includes the State Plane Coordinate grid system and the borrow area limits. The format of the plot may be subject to approval by the Contracting Officer. No dredging shall take place outside of the borrow area limits (horizontal and vertical limits) as shown on the drawings.

3. Dredging Observation. The Contractor shall be responsible for establishing such control as may be necessary to insure that the allowable excavation depths and spatial limits are not exceeded. If the Contractor encounters noncompliant sediment during dredging, the Contractor shall immediately cease dredging, relocate the dredge into compliant sediment, and shall verbally notify the Contracting Officer, providing the time, location, and description of the noncompliant sediment. The Contractor shall also report any encounters with noncompliant sediment in the Contractor's Daily Report, providing depth and location in State Plane Coordinates of said materials within the borrow area. The Contractor, in cooperation with the Contracting Officer, shall use the dredge positioning records, plans, and vibracore descriptions to determine where the Contractor may dredge to avoid additional placement of noncompliant sediment. The Contractor shall adjust his or her construction operation to avoid the noncompliant sediment to the greatest extent practicable.

4. Beach Observation. The Contractor shall continuously visually monitor the sediment being placed on the beach. If noncompliant sediment is placed on the beach, the Contractor shall immediately cease dredging, relocate the dredge into compliant sediment, and verbally notify the Contracting Officer, providing the time, location, and description of the noncompliant sediment. The Contractor shall also report any encounters with noncompliant sediment in the Contractor's Daily Report, providing depth and location in State Plane Coordinates of said materials within the borrow area. The Contractor shall take the appropriate remediation actions as directed by the Contracting Officer.

D. QUALITY ASSURANCE PLAN

The Contracting Officer shall seek to enforce the construction contract and environmental permits related to sediment quality. In order to do so, the following steps shall be followed:

1. **Construction Observation.** Construction observation shall be performed daily by the Contracting Officer or a designated representative during periods of active construction. Most observations shall be conducted during daylight hours; however, random nighttime observations shall be conducted.

2. **On-Site Representative.** The Contracting Officer or a designated representative shall provide on-site observation by individuals with training or experience in beach nourishment and construction inspection and testing, and who are knowledgeable of the project design and permit conditions.

3. **Pre-Construction Meeting.** The project QA/QC Plan shall be discussed as a matter of importance at the pre-construction meeting. The Contractor shall acknowledge the goals and intent of the above described QA/QC Plan, in writing, prior to commencement of construction.

4. **Contractor's Daily Reports.** The Contracting Officer shall review the Contractor's Daily Reports which characterize the nature of the sediments encountered at the borrow area and placed along the project shoreline with specific reference to material that exceeds acceptable limits.

5. **On Call.** The Contracting Officer or a designated representative shall be on call continuously during the period of construction for the purpose of making decisions regarding issues that involve QA/QC Plan compliance.

6. **Addendums.** Any addendum or change order to the Contract shall be evaluated to determine whether or not the change in scope will potentially affect the QA/QC Plan.

7. **During Construction Sampling for Visual Inspection.** To assure that the fill material placed on the beach is in compliance with the Permit, assessments of the beach fill material shall be made as follows:

- a. During excavation and fill placement activities, the Contractor shall collect a sediment sample at not less than 250-foot intervals of newly constructed berm to visually assess grain size, Munsell color, shell content, coarse material content, and silt content. The sample shall be a minimum of 1 U.S. pint (approximately 200 grams). This assessment shall consist of handling the fill material to ensure that it is predominantly sand to note the physical characteristics and assure the material meets the sediment compliance parameter specified in this Plan. The Contracting Officer shall make frequent inspections of the fill material, and if it is deemed necessary quantitative assessments of the sand shall be conducted for grain size, silt content, shell content, coarse gravel content, and Munsell color using the methods outlined herein. The results of these daily inspections, regardless of the quality of the sediment, shall be appended to or notated on the Contractor's Daily Report.
- b. If the Contracting Officer determines that the beach fill material sampled in three successive samples does not comply with the sediment compliance specifications in this QA/QC Plan, the Contracting Officer shall immediately instruct the Contractor to cease operations and take whatever actions necessary to avoid further discharge of noncompliant sediment. The

Contractor, in cooperation with the Contracting Officer, shall use the dredge positioning records, and plans, to determine where the Contractor may dredge to avoid additional placement of noncompliant sediment. The Contractor shall adjust his or her construction operation to avoid the noncompliant sediment to the greatest extent practicable. The sediment inspection results shall be reported to the DEP.

8. Post-Construction Sampling for Laboratory Testing. To assure that the fill material placed on the beach was adequately assessed by the borrow area investigation and design, assessments of the sediment shall be conducted as follows:

- a. Two sand samples shall be obtained immediately following completion of construction at not more than every 2,000 feet along and within the beach fill project area. Each sample shall be tested for grain size distribution, color and shell content. Samples shall be collected from approximately 1 ft below the surface of the dry construction berm at (1) approximately 20 feet from the landward toe of the dune and (2) midway across the top of the berm width; (or, near the landward and seaward edges of the berm fill where the berm width is narrow). This shall amount to up to 20 samples taken throughout the filled area within the 18,600 ft project limits. If patches of inconsistent material are observed between profiles while taking these samples, a visual description of the sediment irregularities, including the location, magnitude, and general characterization should be provided to the Department; and additional samples may be taken as required or appropriate
- b. Samples will be processed to determine grain size distribution between U.S. Standard Sieve sizes 4 (4.76 mm) and 230 (0.625 mm) in addition to the weight fraction retained on the $\frac{3}{4}$ " sieve and categorized as PASS or FAIL with regard to the sand specification. The analysis shall utilize standard sieve sizes at half-phi intervals between U.S. Std. No. 4 and No. 230 (inclusive), and including the $\frac{3}{4}$ " sieve and pan. Assessment shall be likewise made of shell content and color; and at least one-third of the samples shall be quantitatively assessed for carbonate content. Should non-compliant material be detected after placement, additional testing will be conducted to determine its extent, and non-compliant fill will be removed and may be subsequently replaced with compliant fill.
- c. A summary report of the sediment sample data shall be prepared and submitted to FDEP within 60 days after project construction. The summary report shall also indicate the volume, areal extent and location of any beach areas found to contain sand that does not meet the specifications, and remediated areas or areas determined to be subject to remediation.
- d. Should rocks or excessive amounts of large shell or other non-beach compatible material be identified in excess of 50% of background in any 10,000 square ft area, then the non-compatible material shall be removed from the beach fill or remediated to the satisfaction of the Contracting Officer in conjunction with the Canaveral Port Authority. This assessment shall take into account the potential occurrence of non-compatible materials below the surface. Additional acceptable fill may be placed, as required, to meet the construction template requirements.

E. REMEDIATION

1. Compliance Area. If a sample does not meet the compliance value for construction debris, toxic material, other foreign material, the Contracting Officer shall determine the aerial extent and remediate regardless of the extent of the noncompliant material. If a sample is noncompliant for the silt content, shell content, coarse gravel content, or Munsell color and the areal extent exceeds 10,000 square feet, the Contracting Officer shall remediate according to the standards set forth in 62B-41.007(2)(j), unless specified more stringently herein.

2. Notification. If an area of newly constructed beach does not meet the sediment compliance specifications, then the DEP (JCPCCompliance@dep.state.fl.us) shall be notified. Notification shall indicate the areal extent and location of any areas of noncompliant beach fill material and remediation planned. As outlined below, the Contractor shall immediately undertake remediation actions without additional approvals from the DEP. The results of any remediation shall be reported to the DEP following completion of the remediation activities and shall indicate the volume of noncompliant fill material removed and replaced.

3. Sampling to determine extent. In order to determine if an area greater than 10,000 square feet of beach fill is noncompliant, the following procedure shall be performed:

- a. Upon determination that the first sediment sample is noncompliant, at minimum, five (5) additional sediment samples shall be collected at a 25-foot spacing in all directions and assessed. If the additional samples are also noncompliant, then additional samples shall be collected at 25-foot spacing in all directions until the areal extent is identified.
- b. The samples shall be visually compared to the acceptable sand criteria. If deemed necessary by the Contracting Officer, quantitative assessments of the sand shall be conducted for grain size, silt content, shell content, coarse gravel content, and Munsell color using the methods outlined in section D.8.b. Samples shall be archived by the Contracting Officer.
- c. A site map shall be prepared depicting the location of all samples and the boundaries of all areas of noncompliant fill.
- d. The total square footage shall be determined.
- e. The site map and analysis shall be included in the Contractor's Daily Report.

4. Actions. The Contracting Officer shall have the authority to determine whether the material placed on the beach is compliant or noncompliant. If placement of noncompliant material occurs, the Contractor shall be directed by the Contracting Officer on the necessary corrective actions. Should a situation arise during construction that cannot be corrected by the remediation methods described within this QA/QC Plan, the DEP shall be notified. The remediation actions for each sediment parameter is subject to approval by the Canaveral Port Authority, U.S. Army Corps of Engineers, and FDEP may include, but are not limited to

- a. **Silt:** blending the noncompliant fill material with compliant fill material within the adjacent construction berm sufficiently to meet the compliance value, or removing the noncompliant fill material and replacing it with compliant fill material.

- b. **Shell:** blending the noncompliant fill material with compliant fill material within the adjacent construction berm sufficiently to meet the compliance value or removing the noncompliant fill material and replacing it with compliant fill material.
- c. **Munsell color:** blending the noncompliant fill material with compliant fill material within the adjacent construction berm sufficiently to meet the compliance value or removing the noncompliant fill material and replacing it with compliant fill material.
- d. **Coarse gravel:** screening and removing the noncompliant fill material and replacing it with compliant fill material.
- e. **Construction debris, toxic material, or other foreign matter:** removing the noncompliant fill material and replacing it with compliant fill material.

All noncompliant fill material removed from the beach shall be transported to an appropriate upland disposal facility located landward of the Coastal Construction Control Line (CCCL).

5. Post-Remediation Testing. Re-sampling shall be conducted by the Contractor following any remediation actions in accordance with the following protocols:

- a. Within the boundaries of the remediation actions, samples shall be taken at maximum of 25-foot spacing.
- b. The samples shall be visually compared to the acceptable sand criteria. If deemed necessary by the Contracting Officer, quantitative assessments of the sand shall be conducted for grain size, silt content, coarse gravel content, and Munsell color using the methods outlined in section D.8.b. Samples shall be archived by the Contracting Officer.
- c. A site map shall be prepared depicting the location of all samples and the boundaries of all areas of remediation actions.

6. Reporting. A post-remediation report containing the site map, sediment analysis, and volume of noncompliant fill material removed and replaced shall be submitted to the DEP within 90 days following completion of remediation activities.

All reports or notices relating to this permit shall be emailed and sent to the DEP at the following locations:

DEP Bureau of Beaches & Coastal Systems
JCP Compliance Officer
Mail Station 300
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000
Phone: (850) 414-7716
e-mail: JCPCompliance@dep.state.fl.us

