

JOINT
PUBLIC NOTICE

CHARLESTON DISTRICT, CORPS OF ENGINEERS
69A Hagood Avenue
Charleston, South Carolina 29403-5107

and

THE S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Office of Ocean and Coastal Resource Management
1362 McMillan Avenue, Suite 400
Charleston, South Carolina 29405

REGULATORY DIVISION

Refer to: P/N #SAC-2015-01701-1IG

15 March 2016

Pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), Sections 401 and 404 of the Clean Water Act (33 U.S.C. 1344), and the South Carolina Coastal Zone Management Act (48-39-10 et seq.), an application has been submitted to the Department of the Army and the S.C. Department of Health and Environmental Control by

THE SOUTH CAROLINA DEPT OF PARKS, RECREATION AND TOURISM
MR. DAVID SIMMS
C/O STEVEN TRAYNUM
COASTAL SCIENCE AND ENGINEERING
POST OFFICE BOX 8056
COLUMBIA, SOUTH CAROLINA 29202

for a permit to perform dredging and beach nourishment using sand from two offshore borrow areas and construct two low profile sheet pile groins in the

ATLANTIC OCEAN

at locations offshore of and along the shoreline of Hunting Island State Park on Hunting Island, Beaufort County, South Carolina (Latitude 32.3714°, Longitude 80.4367°; St. Helena and Fripp Inlet Quads).

In order to give all interested parties an opportunity to express their views

NOTICE

is hereby given that written statements regarding the proposed work will be received by the **Corps** until

15 Days from the Date of this Notice,

and **SCDHEC** will receive written statements regarding the proposed work until

30 Days from the Date of this Notice

from those interested in the activity and whose interests may be affected by the proposed work.

The proposed work consists of performing dredging, beach nourishment, and constructing

two low profile sheet pile groins. In detail the proposed work consists of placing up to 635,000 cubic yards of beach-quality sand along 9,200 linear feet of ocean shoreline at Hunting Island State Park via hydraulic dredge. Two offshore borrow areas are proposed for use as sand sources. Area "A" is adjacent to and south of the borrow area that was approved for a 2006 nourishment project and is 62 acres in size. Area "B" is 3,500 feet northeast of Area A and is 50 acres in size. These borrow areas are shown on sheets 2, 6, 7, 8, and 9 of 9. The sand will be removed by cutterhead dredge and pumped onto the beach through a pipeline. In addition, the project includes the construction of two groins as shown on sheets 2 through 4 of 9 and discussed in the attached narrative. Due to the nature of the proposed work which is for beach restoration, the applicant did not propose mitigation. The purpose of the project is for erosion control and beach restoration and, according to the applicant, also includes the following:

- To restore the recreational beach and to protect the associated infrastructure.
- To protect campsites and associated infrastructure from further damage.
- To cover exposed roots and mud outcrops which pose hazards to swimmers and liability to the state.
- To maintain park revenues which are dependent on a viable beach and campsite area.
- To minimize impacts to wilderness sections of the beach to preserve the aesthetic character of the oceanfront (including some driftwood areas where no infrastructure or wetlands are at risk).
- To provide beach habitat for shorebirds and turtles where none currently exists.

NOTE: This public notice and associated plans are available on the Corps' website at: <http://www.sac.usace.army.mil/Missions/Regulatory/PublicNotices> . For those unable to access the website, a copy of this notice and the associated plans will be provided, upon receipt of a written request. The request must identify the project of interest by public notice number and a self-addressed stamped envelope must also be provided. Your request should be addressed to the

**U.S. Army Corps of Engineers
ATTN: REGULATORY DIVISION
69A Hagood Avenue
Charleston, South Carolina 29403-5107**

The District Engineer has concluded that the discharges associated with this project, both direct and indirect, should be reviewed by the South Carolina Department of Health and Environmental Control in accordance with provisions of Section 401 of the Clean Water Act. As such, this notice constitutes a request, on behalf of the applicant, for certification that this project will comply with applicable effluent limitations and water quality standards. The work shown on this application must also be certified as consistent with applicable provisions of the Coastal Zone Management Program (15 CFR 930). This activity may also require evaluation for compliance with the S. C. Construction in Navigable Waters Permit Program. State review, permitting and certification is conducted by the S. C. Department of Health and Environmental Control. The District Engineer will not process this application to a conclusion until such certifications are received. The applicant is hereby advised that supplemental information may be required by the State to facilitate the review.

This notice initiates the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Implementation of the

proposed project would impact approximately 135 acres (85 for nourishment and 50 for dredging) of estuarine substrates utilized by various life stages of species comprising the shrimp, and snapper-grouper management complexes. The District Engineer's initial determination is that the proposed action would not have a substantial individual or cumulative adverse impact on EFH or fisheries managed by the South Atlantic Fishery Management Council and the National Marine Fisheries Service (NMFS). The District Engineer's final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the NMFS.

Pursuant to the Section 7 of the Endangered Species Act of 1973 (as amended), the Corps has reviewed the project area, examined all information provided by the applicant, and the District Engineer has determined that the project is not likely to adversely affect the West Indian Manatee (*Trichechus manatus*). This public notice serves as a request for written concurrence from the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service on this determination.

In addition, pursuant to the Section 7 of the Endangered Species Act of 1973 (as amended), the Corps has reviewed the project area, examined all information provided by the applicant, and the District Engineer has determined, based on the most recently available information that the project may affect the Piping Plover (*Charadrius melodus*), the Red Knot (*Calidris canutus*), and the Loggerhead Sea Turtle (*Caretta caretta*). A biological assessment (or other similar document) detailing our analysis of the potential effects of the action will be provided to the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service..

Pursuant to Section 106 of the National Historic Preservation Act (NHPA), this public notice also constitutes a request to Indian Tribes to notify the District Engineer of any historic properties of religious and cultural significance to them that may be affected by the proposed undertaking.

In accordance with Section 106 of the NHPA, the District Engineer has consulted South Carolina ArchSite (GIS), for the presence or absence of historic properties (as defined in 36 C.F.R. 800.16)(1)(1)), and has initially determined that no historic properties are present; therefore, there will be no effect on historic properties. To ensure that other historic properties that the District Engineer is not aware of are not overlooked, this public notice also serves as a request to the State Historic Preservation Office and any other interested parties to provide any information they may have with regard to historic properties. This public notice serves as a request for concurrence within 30 days from the SHPO (and/or Tribal Historic Preservation Officer).

The District Engineer's final eligibility and effect determination will be based upon coordination with the SHPO and/or THPO, as appropriate and required and with full consideration given to the proposed undertaking's potential direct and indirect effects on historic properties within the Corps-identified permit area.

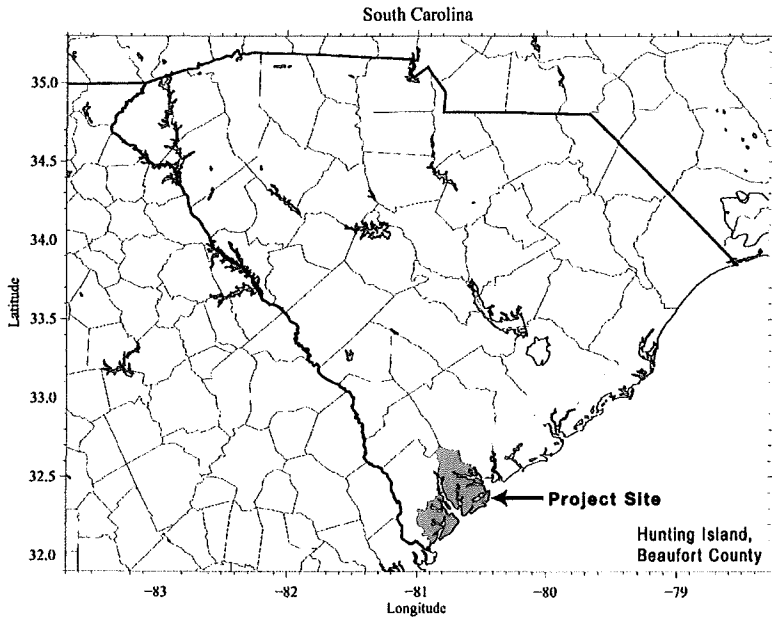
Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for a public hearing shall state, with particularity, the reasons for holding a public hearing.

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the activity on the public interest and will include application

of the guidelines promulgated by the Administrator, Environmental Protection Agency (EPA), under authority of Section 404(b) of the Clean Water Act and, as appropriate, the criteria established under authority of Section 102 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the project must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the project will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production and, in general, the needs and welfare of the people. A permit will be granted unless the District Engineer determines that it would be contrary to the public interest. In cases of conflicting property rights, the Corps cannot undertake to adjudicate rival claims.

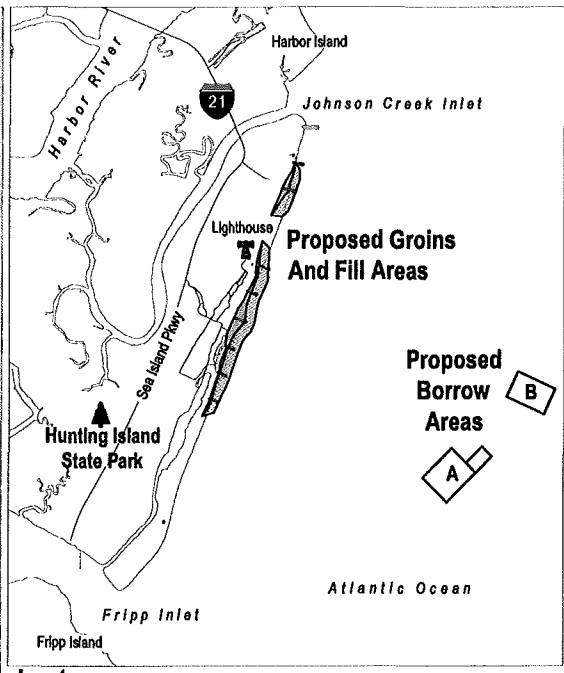
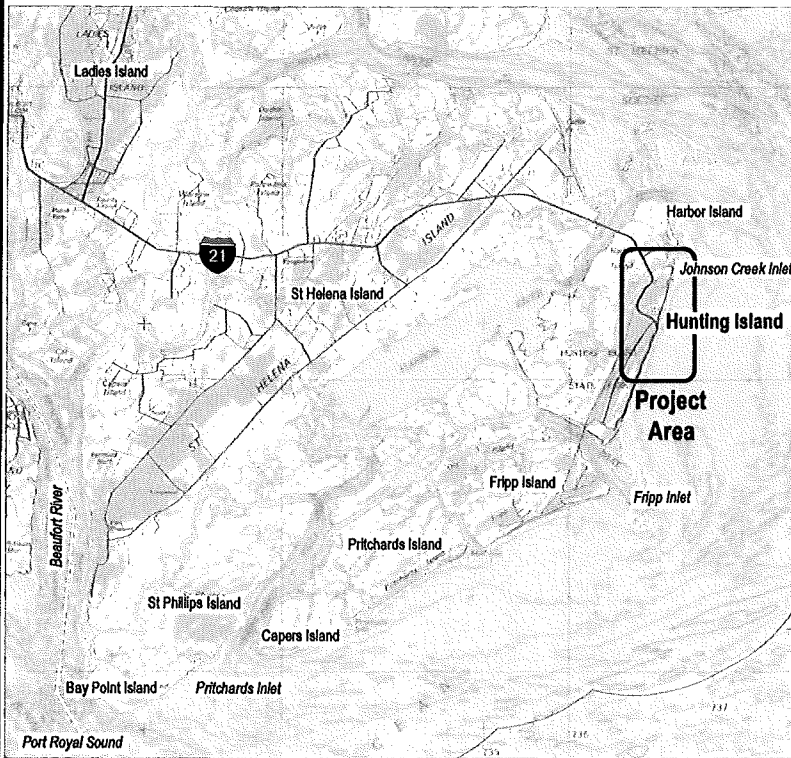
The Corps is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this project. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the activity.

If there are any questions concerning this public notice, please contact Mary Hope Green at 843-329-8044 or toll free at 1-866-329-8187.



DIRECTIONS FROM SC HWY 17:
 Take Highway 21 south to Hunting Island. Enter the park at the campground entrance (first left). Proceed to the beach access parking area.

Project Site Coordinates
 Latitude: 32° 22' 00" N
 Longitude: 80° 26' 26" W

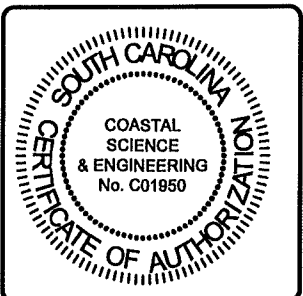
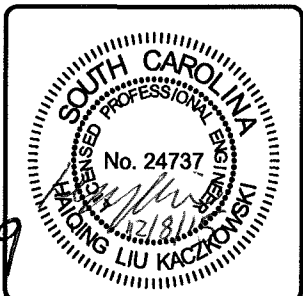


APPLICANT:
 The South Carolina Department of Parks, Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

DRAWING TITLE:
VICINITY MAP
PROJECT: Hunting Island Beach Re-Nourishment Project

AGENT:
 Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

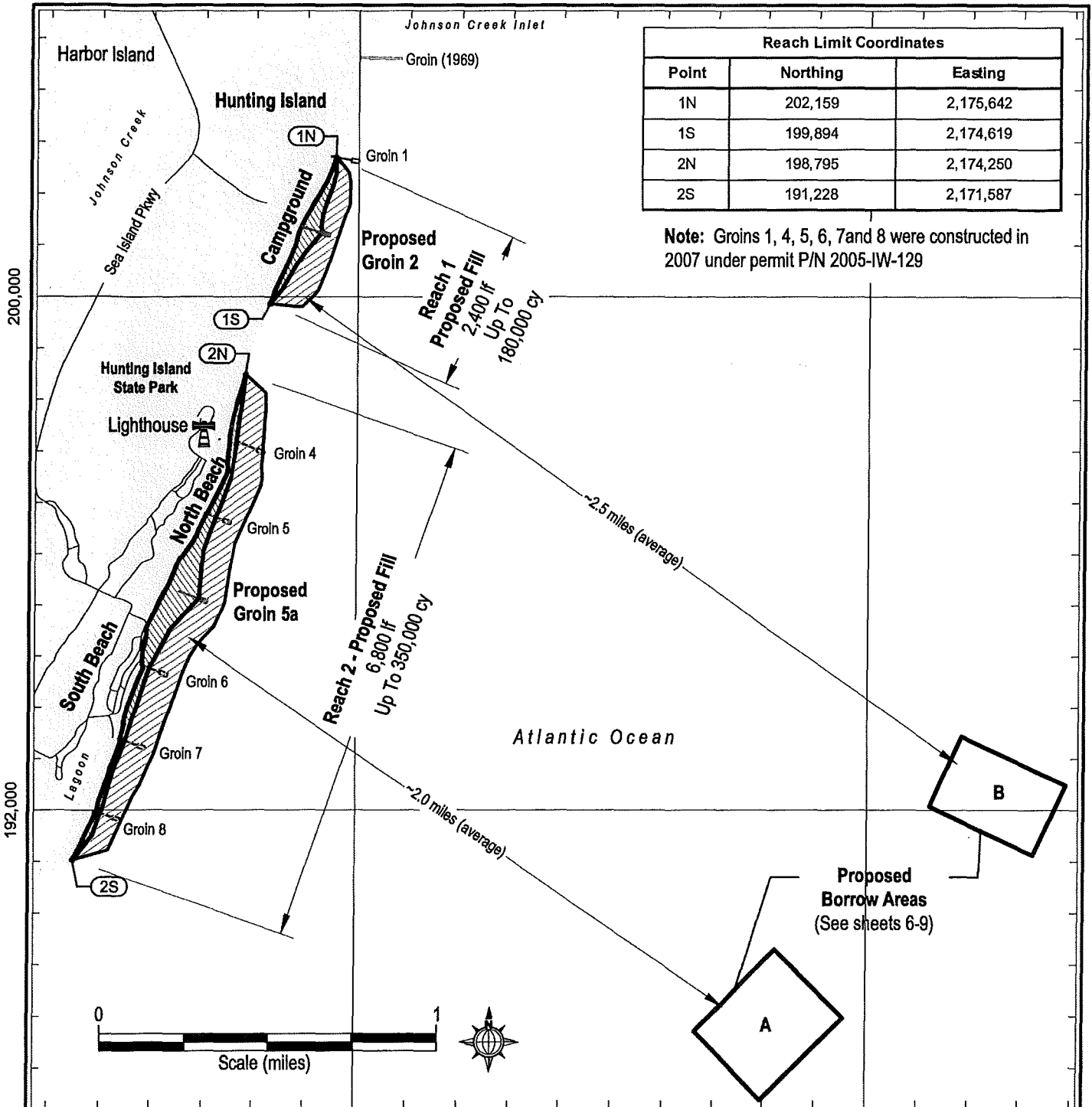
Scale: As Shown Sheet #: 01 of 9
 Date: 08 Dec 2016
 Permit #
 Project #: 2445



SAC - 2015 - 01701 - 1IG

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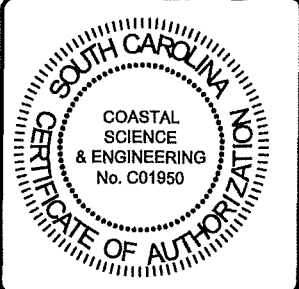


APPLICANT:
 The South Carolina Department of Parks,
 Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

DRAWING TITLE:
OVERALL PLAN MAP

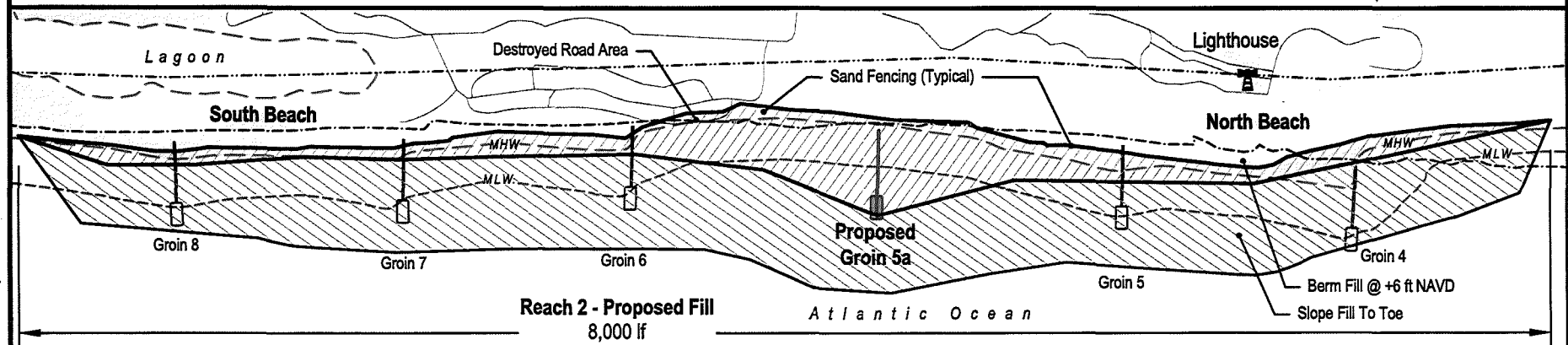
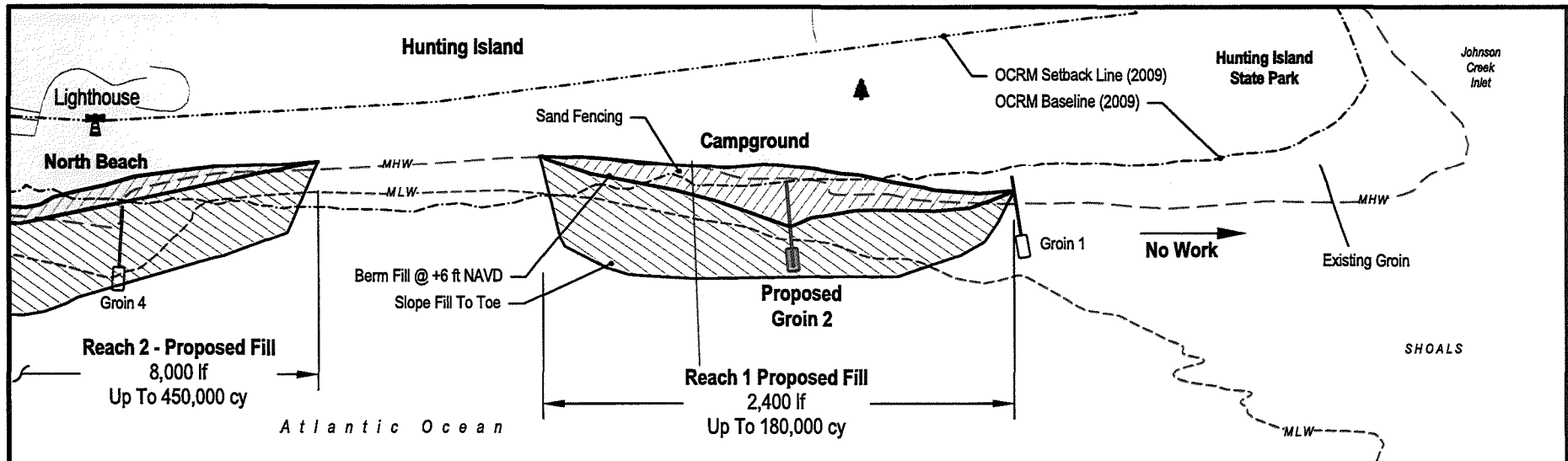
AGENT:
 Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

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 Date: 24 Feb 2016
 Permit #
 Project #: 2445 of 9



SAC - 2015 - 01701

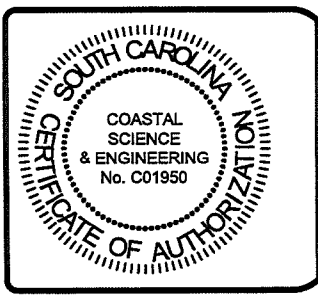
SAC - 2015 - 01701



Datum Notes:
 Horizontal: SPCS NAD '83 (Feet) SC Zone 3900
 Vertical: NAVD 88 (Feet)
 Contours Shown Collected August 2015

- Nourishment Berm Slope Section
- Existing Groin
- Proposed Groin

- Legend**
- Mean High Water 2.88 ft NAVD
 - Mean Low Water -3.58 ft NAVD
 - OCRM Setback Line (2009)
 - OCRM Baseline (2009)



APPLICANT:
 The South Carolina Department of Parks,
 Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

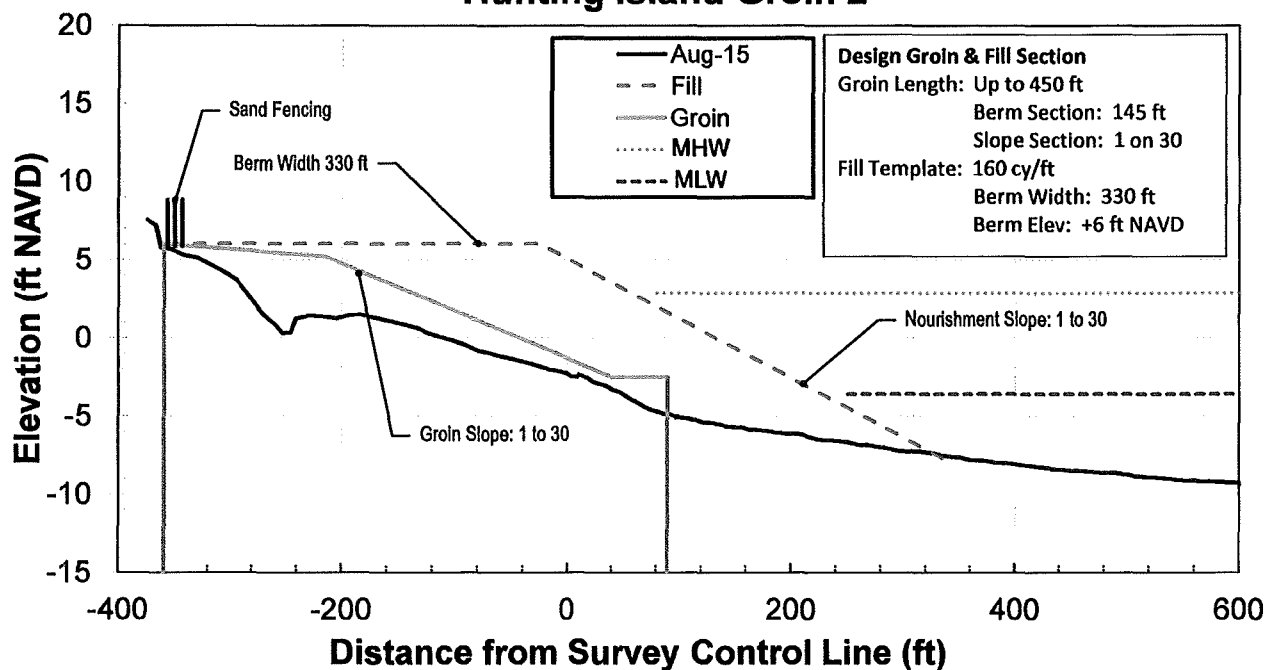
AGENT:
 Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

DRAWING TITLE:
 PROJECT FILL PLAN

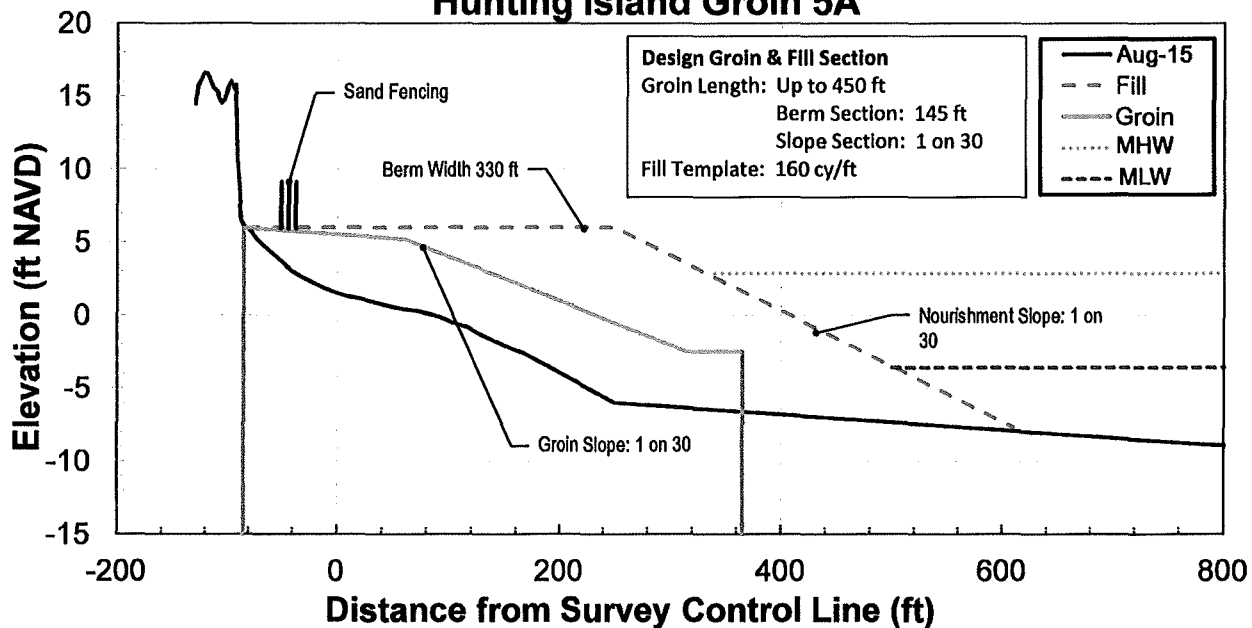
Scale: As Shown Sheet #: 03
 Date: 8 Dec 2015
 Permit #
 Project #: 2416

03
 OF 9

Hunting Island Groin 2



Hunting Island Groin 5A



APPLICANT:

The South Carolina Department of Parks,
 Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

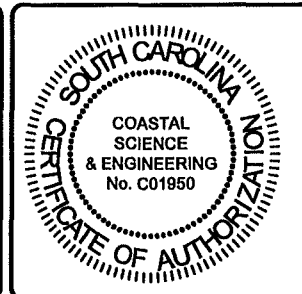
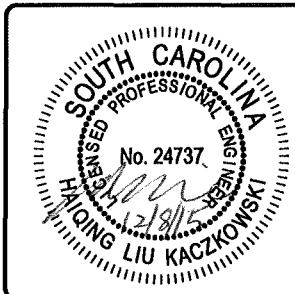
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FILL & GROIN SECTIONS

AGENT:

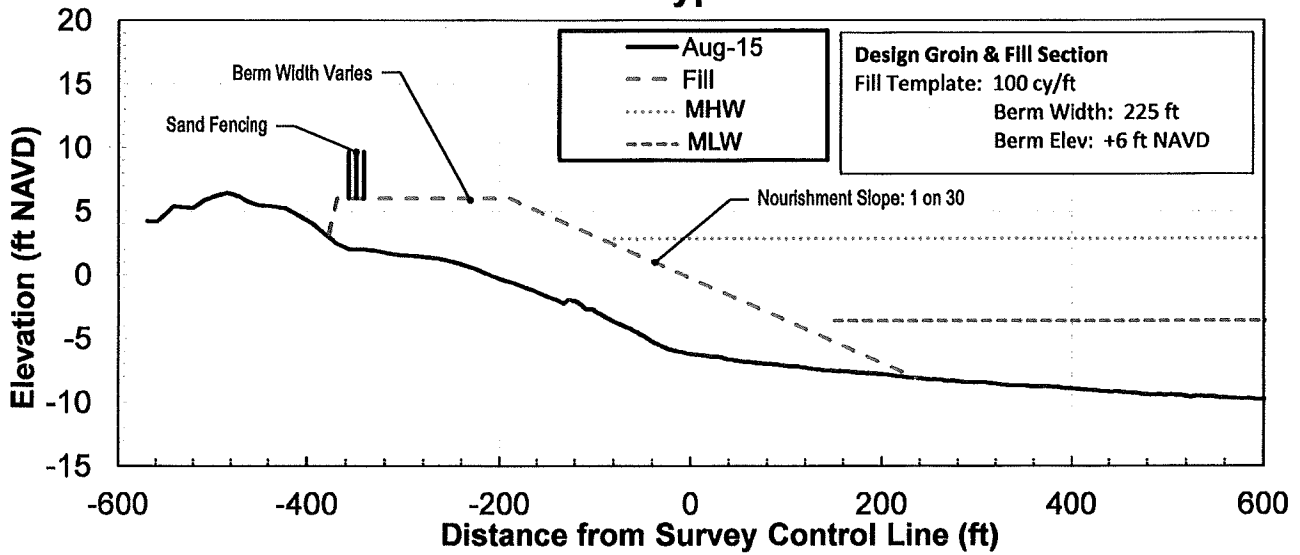
Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

Scale: As Shown Sheet #: **04**
 Date: 8 Dec 2015
 Permit #
 Project #: 2445

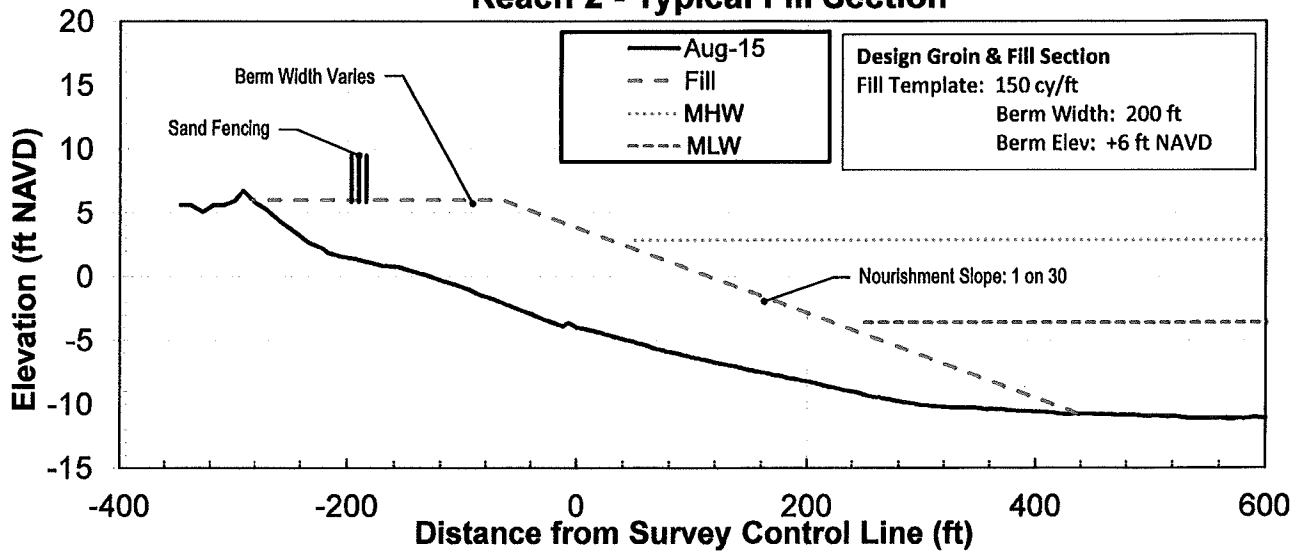


SAC-2015-01701

Reach 1 - Typical Fill Section

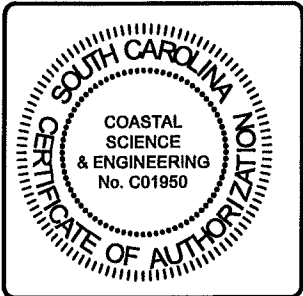
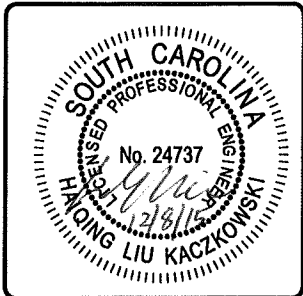


Reach 2 - Typical Fill Section



APPLICANT:
 The South Carolina Department of Parks,
 Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

DRAWING TITLE:
**TYPICAL NOURISHMENT
 SECTIONS**



AGENT:
 Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

Scale: As Shown	Sheet #: 05
Date: 8 Dec 2015	05 of 9
Permit #	
Project #: 2445	

SAC-2015-01701

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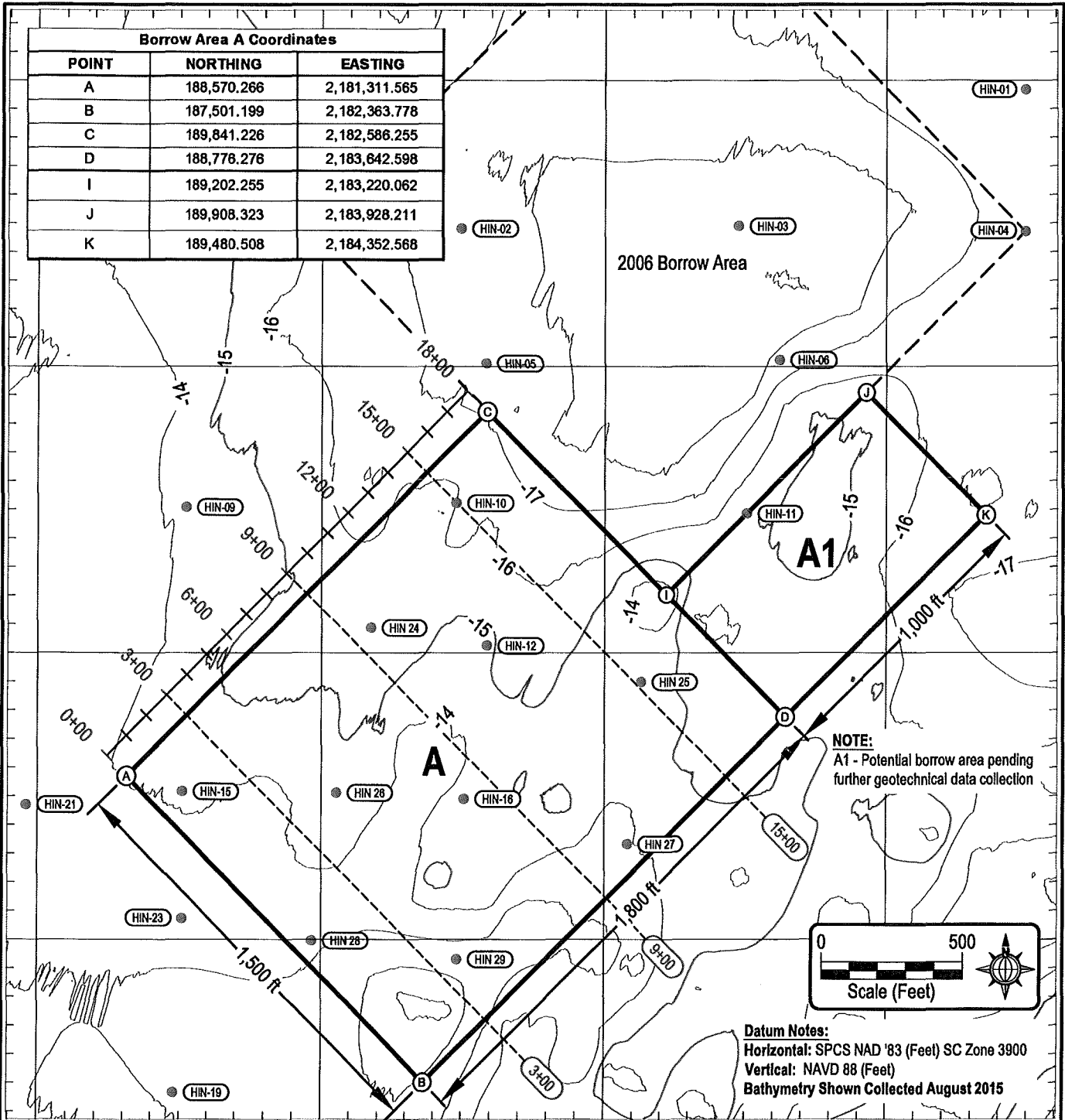
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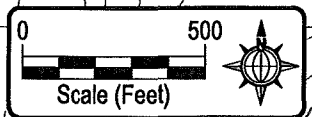
189,000

188,000

Borrow Area A Coordinates		
POINT	NORTHING	EASTING
A	188,570.266	2,181,311.565
B	187,501.199	2,182,363.778
C	189,841.226	2,182,586.255
D	188,776.276	2,183,642.598
I	189,202.255	2,183,220.062
J	189,908.323	2,183,928.211
K	189,480.508	2,184,352.568



NOTE:
A1 - Potential borrow area pending further geotechnical data collection



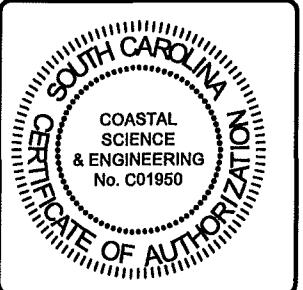
Datum Notes:
Horizontal: SPCS NAD '83 (Feet) SC Zone 3900
Vertical: NAVD 88 (Feet)
Bathymetry Shown Collected August 2015

APPLICANT:
The South Carolina Department of Parks,
Recreation & Tourism (SCPRT)
(Hunting Island State Park)

DRAWING TITLE:
**BORROW AREA "A"
AND "A1" PLAN**

AGENT:
Coastal Science & Engineering
PO Box 8056
Columbia, SC 29202

Scale: As Shown Sheet #: **06**
Date: 8 Dec 2015
Permit #
Project #: 2445



SAC-2015-01701

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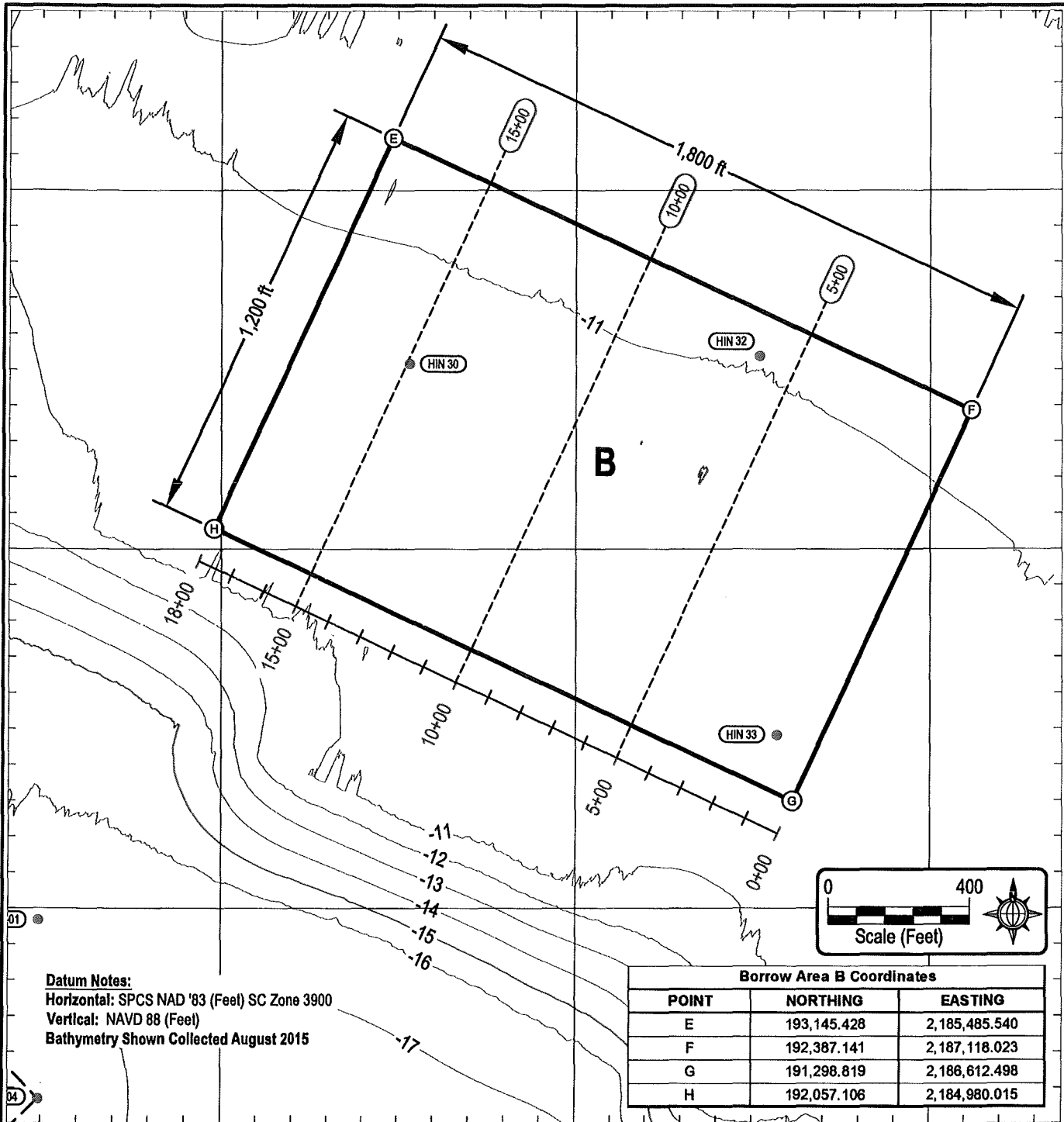
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Datum Notes:
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 Vertical: NAVD 88 (Feet)
 Bathymetry Shown Collected August 2015

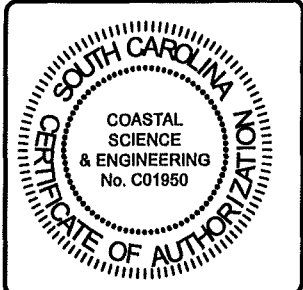
Borrow Area B Coordinates		
POINT	NORTHING	EASTING
E	193,145.428	2,185,485.540
F	192,387.141	2,187,118.023
G	191,298.819	2,186,612.498
H	192,057.106	2,184,980.015

APPLICANT:
 The South Carolina Department of Parks,
 Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

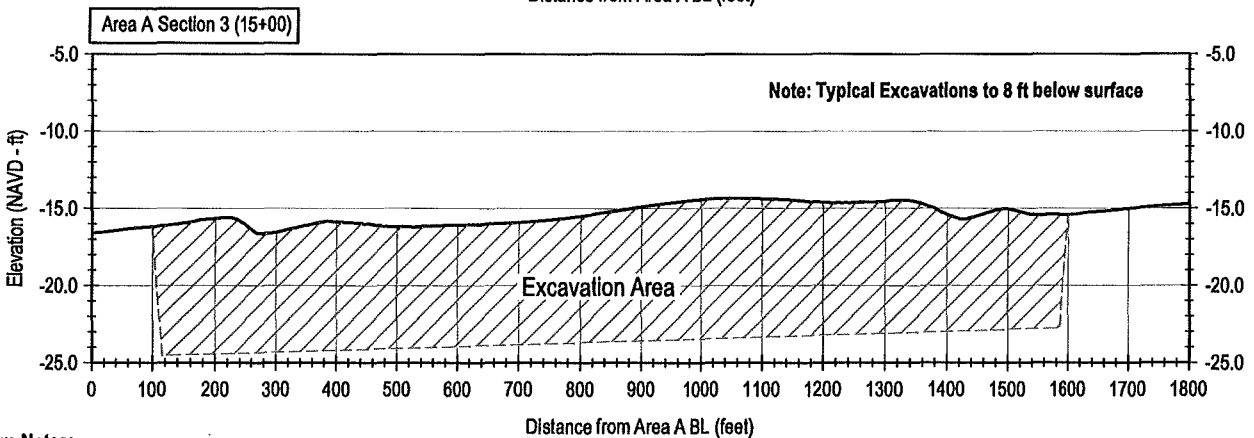
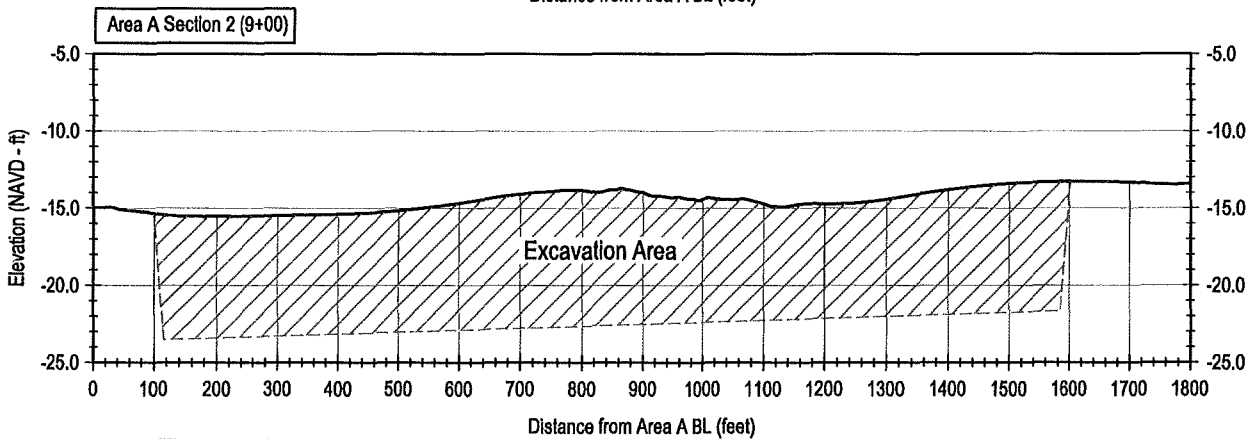
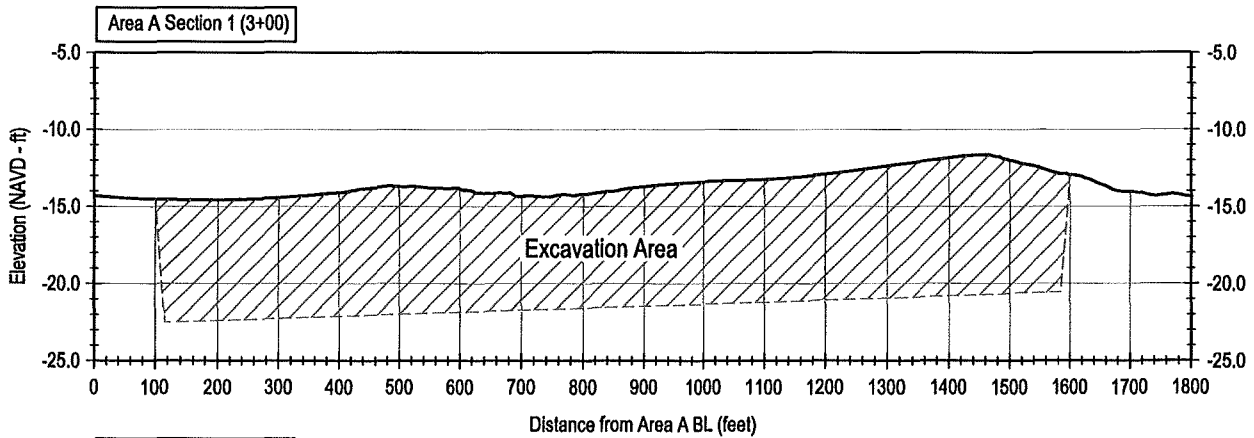
DRAWING TITLE:
BORROW AREA "B" PLAN

AGENT:
 Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

Scale: As Shown Sheet #: **07**
 Date: 8 Dec 2015
 Permit #
 Project #: 2445 of 9



SAC-2015-01701



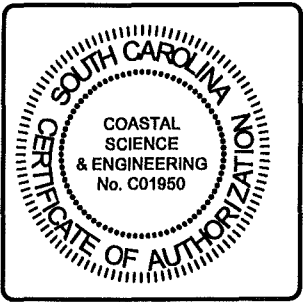
Datum Notes:
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 Bathymetry Shown Collected August 2015

APPLICANT:
 The South Carolina Department of Parks,
 Recreation & Tourism (SCPRT)
 (Hunting Island State Park)

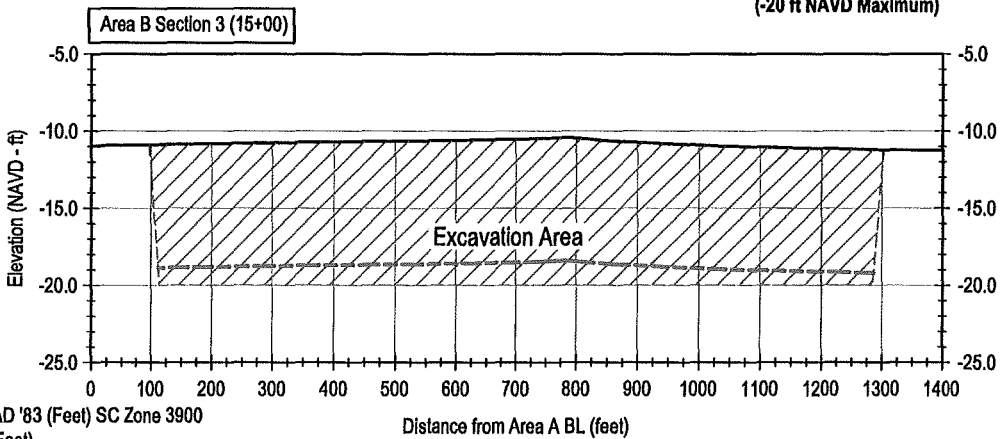
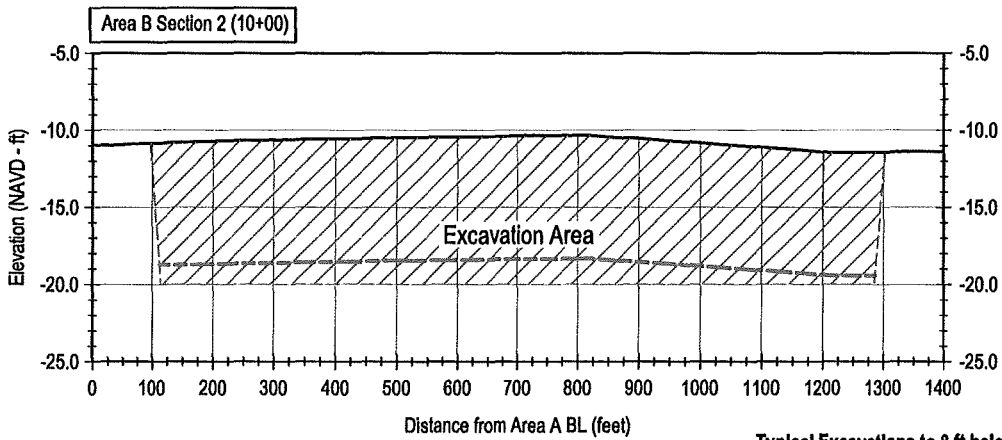
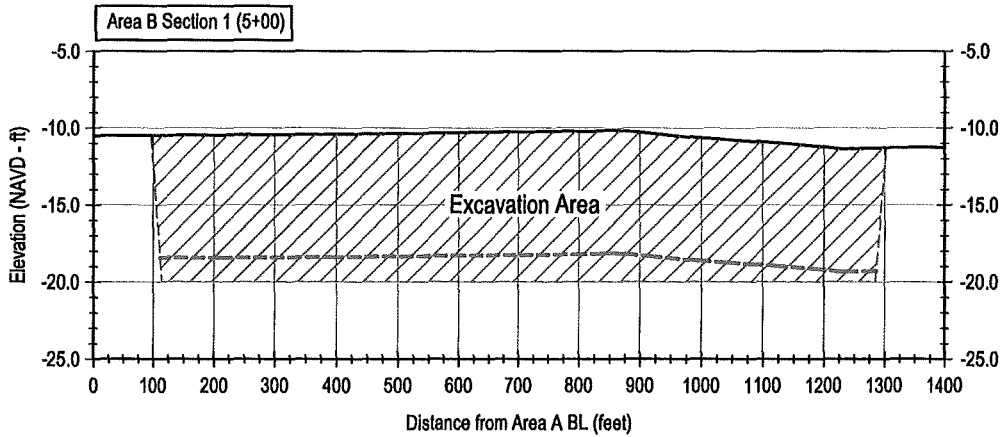
DRAWING TITLE:
BORROW AREA "A"
Excavation Sections

AGENT:
 Coastal Science & Engineering
 PO Box 8056
 Columbia, SC 29202

Scale: As Shown Sheet #: 08
 Date: 8 Dec 2015
 Permit #
 Project #: 2445 of 9



SAC-2015-01701



Typical Excavations to 8 ft below surface
(-20 ft NAVD Maximum)

Datum Notes:

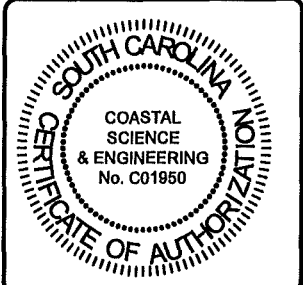
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Vertical: NAVD 88 (Feet)

Bathymetry Shown Collected August 2015

APPLICANT:
The South Carolina Department of Parks,
Recreation & Tourism (SCPRT)
(Hunting Island State Park)

DRAWING TITLE:
BORROW AREA "B"
Excavation Sections



AGENT:
Coastal Science & Engineering
PO Box 8056
Columbia, SC 29202

Scale: As Shown Sheet #: **09**
Date: 8 Dec 2015
Permit #
Project #: 2445 of 9

SAC-2015-01701

32. DESCRIPTION OF THE OVERALL PROJECT AND OF EACH ACTIVITY IN OR AFFECTING U.S. WATERS OR STATE CRITICAL AREAS

The proposed activity is a beach nourishment and groin construction project along Hunting Island, SC (see Sheet 01). Work will include placement via hydraulic dredge of up to 630,000 cubic yards (cy) of beach-quality sediment along up to 9,200 linear feet (lf) of ocean-facing shoreline and construction of two ~450 ft groins. The project area extends from existing Groin #1 at the Hunting Island State Park Campground to a point ~2,400 ft south along the oceanfront. Proposed Groin #2 (previously permitted under P/N 2005-1W-129P) would be constructed ~1,200 ft south of existing Groin #1 (Sheet 02). The second project reach extends from North Beach near the lighthouse to the South Beach recreation area, a length of up to 8,000 lf. Nourishment in Reach 2 would begin 1,000 ft north of existing Groin #4 and end near ~1,000 ft south of Groin #8. The second proposed groin (herein designated as Groin #5A) would be placed midway between existing Groin #5 and Groin #6 (see Sheet #03).

The previous nourishment and groin construction project was successfully completed between May 2006 and April 2007 using a cutterhead dredge and offshore borrow area for nourishment (570,000 cy placed between 21 May and 11 June 2006). Groins were constructed via land-based equipment on the newly nourished beach between 5 January and 23 April 2007. The permit for that project allowed construction of 9 groins; however only 6 were able to be constructed due to the available budget. Permitted groins #2, #3, and #9 were not constructed.

Nourishment would be placed along up to 10,400 lf of shoreline which represents ~50% of the length of Hunting Island. The fill sections will be varied strategically to place extra sand in the vicinity of the two proposed groins so as to facilitate construction via land-based equipment. Following completion of the groins, excess sand in the vicinity is expected to spread and be transported north toward Johnson Creek Inlet. Surveys following the 2006 project confirmed net northerly transport of sand in each groin cell and extensive accumulation in the shoals of Johnson Creek Inlet.

Each groin will be ~450 ft long, comparable to the existing groins, and extend seaward from the existing back beach/dune escarpment. The groins will be capped sheetpile structures with a protective surround of armorstone at the heads. Profiles will be sloped to follow the natural contours of the beach including a berm section matching the native dry beach elevation, a sloping intertidal section at a slope of 1 on 30, and a 50-75 ft long low-tide section with crest ~1 ft above mean low water (see sheet 04).

Nourishment Plan

Borrow Area(s) –

Two potential borrow areas are being considered for the project (see Sheets 06-09).

- 1) Offshore Area A is adjacent to and south of the borrow area used in the 2006 project. Area A is approximately 62 acres (1,800 ft by 1,500 ft) centered ~1.8 miles offshore of the Hunting Island lighthouse in depths of ~14 to 15 ft NAVD (see Sheets 02, 06-09). Maximum excavation

depth would be ~8 ft to accommodate operational requirements of cutterhead dredges. Area A consists of 0.221 millimeter (mm) mean diameter fine sand with less than 1% mud and less than 2 % material coarser than 2 mm. Previous geotechnical data and post construction sampling for the 2006 project (CSE 2007) indicated the mud content in the vicinity of the proposed borrow area is at trace to minor levels, although unconsolidated mobile mud patches have been observed at the bottom off Hunting Island (CSE 1991, Kana and Mohan 1998). Such mud tends to mix with the water column and be dispersed rapidly by waves. The available borings (sheets 06 and 08 and Attachment 1) do not exhibit significant lenses of heavy compacted clays.

Area A1 is a 1,000 ft x 600 ft area (~13.8 acre) area extending along the northeastern boundary of Area A and is adjacent to and south of the 2006 borrow area. Area A1 is thought to contain similar material as Area A, however, insufficient borings have been obtained to date to confirm this. Future borings will be obtained in A1 and should the sediment characteristics prove similar to Area A and the native beach, will applicant will submit results of the sampling to permitting agencies for review and request that the area be included in the permitted borrow area.

- 2) Offshore Area B is 3,500 ft northeast of Area A and encompasses ~50 acres (1,800 ft by 1,200 ft). Initial borings indicate the sediment characteristics in the area are similar to Area A, with fine sand slightly finer than area A (average grain size of 0.173 mm) and only minor amounts of mud and shell. Typical depths in Area B are -10 to -11 ft NAVD. Dredge depths in Area B will be up to 10 ft below grade to provide sufficient clearance for dredge operations. Where possible, excavations will be limited to 8 ft below grade if sufficient clearance for the dredge exists. Where required for equipment clearance, excavations will extend to a maximum depth of -20 ft NAVD.

Combined, areas A and B potentially can provide ~1.44 million cy of nourishment sand if excavated to 8 ft below grade. This is ~2.5 times as much sand as required for nourishment, as only 41 acres are needed to satisfy the nourishment quantity (with allowance for side slopes and some handling losses, as much as 50 acres of borrow area may be required during construction). Area A1 may provide another 177,000 cy if excavated to 8 ft. The excess available area allows room for the dredge to move in the event areas of increased mud, shell, or otherwise unsuitable material is encountered. The proposed maximum dredging depth (-20 ft NAVD) is based on minimum operational requirements of ocean-certified cutterhead dredges at low water tide stage. The existing fleet of dredges typically requires a minimum of 17 ft operational depth. A depth of -20 ft NAVD corresponds to approximately -17 ft mean low water.

Fill Placement –

The applicant is requesting to place between 40 and 160 cubic yards per linear foot of nourishment sand in the designated fill areas. The extent of the constructed project will depend on the available budget at time of construction and bid prices. Profiles of the beach fill and groins are shown on Sheets 4 and 5. Nourishment sand will be pumped from the selected borrow areas(s) via hydraulic dredge to areas along Hunting Island described below and listed in order or priority:

- 1) Reach 1 – Campground Area – Placement of up to 180,000 cy over 2,400 lf (average of 75 cy/ft) to create a berm extending from existing Groin #1 south 2,400 ft. This will provide a construction berm width of ~225 ft.
- 2) Reach 2 – North and South Beach – Placement of up to 450,000 cy over 8,000 lf (average of 56.23 cy/ft) from a point ~1,000 ft north of existing Groin #4 to a point ~1,000 ft south of Groin #8. This will provide a construction berm width of ~200 ft in full sections.

Each fill area will terminate with a taper section to provide a smooth transition between nourished and non-nourished areas. The length of the taper sections is included in the above dimensions. Land-based equipment will spread and grade the nourishment sand to the slopes and elevations shown in the beach and groin profiles on Sheets 03-05. Fill will be graded to the design template, including a berm at +6 ft NAVD, and a seaward slope of 1 on 30. The contractor will control the fill slope to the mean tide level. Waves will redistribute the nourishment material into a natural beach profile. The volume of the nourishment in full sections will vary from 50 cy/ft to 160 cy/ft.

Sand Fencing –

Sand fencing will be placed along the landward edge of the nourishment fill to promote dune growth. Native dune vegetation may also be planted to further expedite dune formation. Fencing will be installed according to sea turtle friendly design standards included in OCRM's How to Build a Dune brochure, which call for chevrons opening toward the ocean with a minimum 5 ft gap between chevrons.

Groins

Following demonstrated performance of the six groins constructed in 2007, two new groins are proposed for purposes of retaining sand in priority areas along Hunting Island. The groin locations are illustrated in Sheet 03. One of the groins (#2) is proposed at the south end of the campground area, where it was permitted previously. The other groin is proposed to be placed between North and South Beach recreational areas (this area was not considered in the earlier project). Groins #3 and #9, which were permitted for the 2006 project, are not being considered in the present proposed plan. The plan for groins builds upon a preliminary design prepared by CSE Baird (1998) and the USACE (September 2004) draft environmental assessment. Profiles of the groins are provided on Sheet 5.

The final number and dimensions of groins will depend on funds available and bid prices for nourishment and structure costs. The lengths will be balanced against the nourishment requirements to optimize sand-trapping by each structure. Detailed studies of the optimal configuration of groins and nourishment are in progress. The indicated groin lengths and nourishment volumes represent the maximum requested in the present permit application.

Groin profiles will follow the natural beach contours after nourishment with each groin containing a berm section (dry-beach zone), sloping beach-face section, and low-tide beach section (see Sheet 5). The beach-face section will slope at 1 on 30. Lengths will range from ~400 ft to 450 ft total so as to

encompass the active beach zone of Hunting Island. Table 1 lists the groin locations by groin number and baseline station.

TABLE 1. Proposed maximum groin lengths.

Groin #	Groin Station (CSE Baseline)	Groin Length (linear feet)
2	-15+00	450
5A	45+00	450

Groins will be constructed immediately after beach nourishment with most work performed “in the dry.” The proposed material will be capped steel or composite sheet pile (similar design as the existing groins). Sheet pile length will be between 15 and 20 ft, with the longest sheets along the intertidal beach and berm sections. Installation will be by conventional marine construction methods with sheet piles both washed and driven into place.

Each groin will include a partially buried scour apron of quarry stone around the toe of the groin structure to hold the toe elevations in place. The stone toe protection will be placed along the low-tide portion of the groin, extending beyond the sheet pile to provide protection from breaking waves. Stone in the armor portion will be graded granitic quarry stone weighing from 500 to 2000 pounds. A layer of bedding stone will be placed under the armor stone approximately 5 ft below the crest of the groin.

No groins are proposed along the southern ~33 percent of Hunting Island. Net longshore transport along most of Hunting Island is to the north.

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33. OVERALL PROJECT PURPOSE AND THE BASIC PURPOSE OF EACH ACTIVITY IN OR AFFECTING U.S. WATERS

The purpose of the project is for erosion control and beach restoration, including:

- Restore the recreational beach and protect associated infrastructure.
- Protect campsites and associated infrastructure from further damage.
- Cover exposed roots and mud outcrops which pose hazards to swimmers and liability to the state.
- Maintain park revenues which are dependent on a viable beach and campsite area.
- Minimize impacts to wilderness sections of the beach so as to preserve the aesthetic character of the oceanfront (including some driftwood areas where no infrastructure or wetlands are at risk).
- Provide dry beach habitat for shorebirds and turtles where none currently exist.

History

Hunting Island is one of the most rapidly eroding barrier islands on the US East Coast with losses averaging upward of 25 feet per year (ft/yr). The first beach restoration project was completed by the US Army Corps of Engineers in 1968 (Table 2). Subsequent renourishment was performed in 1971, 1975, and 1980, before the federal authorization expired in 1984. The state assumed responsibility for beach maintenance in the late 1980s, renourishing the central portion of the island in 1991. In the late 1990s, the US government resumed studies of the island under Section 14 (Emergency Streambank and Shore Protection), Section 103 (Hurricane and Storm Damage Reduction), and Section 206 (Ecosystem Restoration). A small-scale renourishment was completed under Sections 14 and 103 along an ~2,500 ft reach in 2003 and another 80,000 cy were added in 2005 to the same area. As Table 2 shows, projects between 1968 and 2005 added 4.5 million cubic yards (cy) to Hunting Island from various borrow sources.

In 2006, the last nourishment of Hunting Island was completed under P/N 2005-1W-129 (CSE 2007). A total of 644,000 cy were placed along three reaches as shown in Figure 1 using an offshore borrow area located ~2 miles offshore of the Hunting Island Lighthouse. The distribution of the fill was as follows:

Campground Reach – 143,600 cy over 1,850 lf

North Beach Reach – 205,500 cy over 2,420 lf

South Beach Reach – 294,900 cy over 3,625 lf

A total of six groins were installed following nourishment, each of which was between 425 and 470 ft long. One groin was placed along the campground area, two along North Beach, and three along South Beach. Non-nourished areas between the groin clusters were left to erode naturally.

TABLE 2. Record of previous nourishment projects at Hunting Island, SC. *Note: actual costs unadjusted for inflation.*

*Project	Construction Dates	Volume (cy)	Limits of Placement	Net Unit Cost (\$/cy)	Total Cost (\$)
1968	Feb– Dec '68	750,000	*50+00N to 50+00S	\$0.58	\$435,178
1971	May–Dec '71	761,324	50+00N to 50+00S	\$0.70	\$534,000
1975	Apr–Jun '75	612,974	60+00N to 30+00S	\$1.58	\$971,540
1980	Jan–May '80	1,412,692	24+60N to 97+00S	\$1.60	\$2,267,201
1991	Feb–Apr '91	757,644	~20+00N to 55+00S	\$3.80	\$2,876,250
2003	Jan–Mar '03	230,181	~45+00S to 70+00S	\$10.78	~\$2,480,250
2005	Apr–May '05	87,092	~45+00S to 70+00S	\$19.13	\$1,666,326
2006	May–Jun '06	644,222	13+45N to 31+85 N; 15+00S to 40+25S; 52+00S to 89+00S	\$6.80	\$4,379,300
	TOTALS	5,256,129		\$2.50	\$13,129,795

Annual monitoring has been conducted of the 2006/2007 project to document performance of the nourishment and effectiveness and impacts of the groins. Surveys encompassed the entire Hunting Island beach, and aerial photographs included portions of Fripp Island and Harbor Island. Results have been submitted to state and federal agencies in annual monitoring reports, the last of which was dated June 2014. As a condition of the permit for the 2006/2007 project, the applicant was required to monitor potential downdrift impacts of the groins for five years post project. Results of the monitoring show that between 2007 and 2012, an estimated 538,500 cy of sand shifted from the project areas to the north spit of Hunting Island, which agreed with pre-project estimates (CSE 2005, CSE 2014, Traynum et al 2010).

Large-scale morphologic changes in the delta of Johnson Creek Inlet have occurred since monitoring began, with several shoals forming and migrating towards Harbor Island. These natural changes in the inlet delta are common to other inlets along the South Carolina Coast. Such a large volume of sand has built in the shoals that it has created an intertidal beach stretching over 2,000 ft from the upland shore of Harbor Island. Several independent shoals have detached from the Johnson Creek Inlet delta and migrated towards Harbor Island, forming a marsh-filled lagoon system and extensive sand flats. The seaward accumulations of sand have prevented waves from moving sand to the northern end of Harbor Island. These processes are occurring immediately adjacent to St Helena Sound, and result from changes in the sound delta. The scale and quantities of the morphological changes occurring in the delta of Johnson Creek Inlet and in St. Helena Sound (which involve sand quantities over 1.5 million cy) dwarf the potential impacts of the groins.

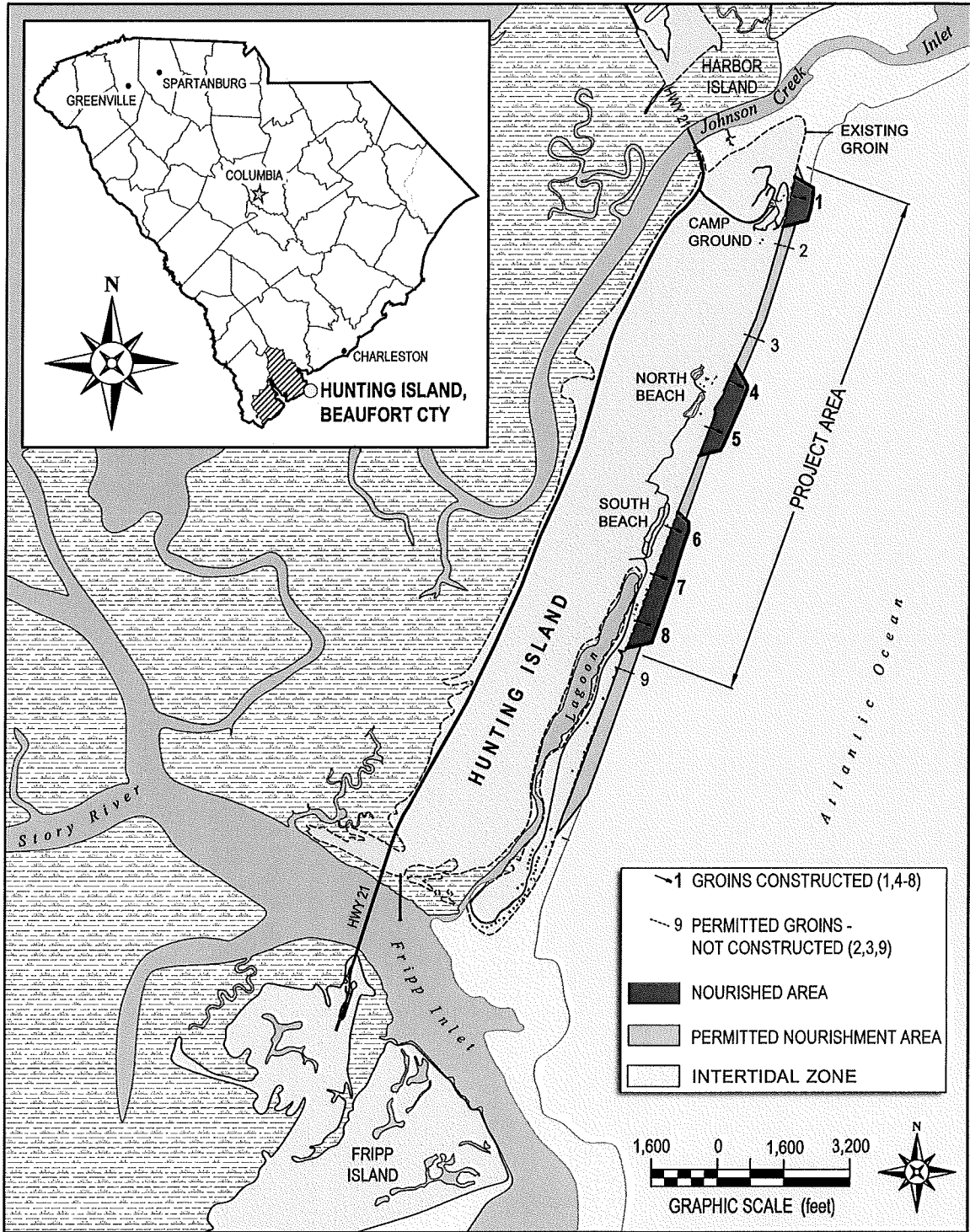


FIGURE 1. 2006-2007 Hunting Island Beach Restoration Project plan, including the limits of the permitted project and the actual construction limits. Groins 2, 3, and 9 were not constructed due to budget limitations.

Since the dominant transport direction along the area of Hunting Island with groins is to the north, no significant impacts to the southern end of Hunting Island or Fripp Island were anticipated following the 2006/2007 project. Monitoring following the project shows an increasing erosion rate moving further away from the groins, which suggests that erosion of the southern end of Hunting Island is related to processes occurring within Fripp Inlet. The erosion rate along the southern mile of the island has decreased since groins were installed, from 28.5 cy/ft per year from 2004 to 2007, to 19.3 cy/ft per year from 2007-2015. If groins were causing erosion of the south end, one would expect the most severe erosion to occur adjacent to the structure.

Beach volume change inside and outside of the groin clusters shows the positive impact the structures have on reducing the erosion rate updrift of the structures. Monitoring surveys between 2004 and 2015 were used to evaluate the pre-project and post project erosion rates (Figure 2). The pre-project rates were calculated using surveys from February 1998 and November 2005. Accounting for the 300,000 cy of sand added in the two USACE nourishment projects, the average erosion rate in the areas updrift of the North Beach and South Beach groin clusters decreased from 10.6 cy/ft per year (1998-2005) to 4.5 cy/ft per year (2007-2015). The area downdrift of North Beach (between North Beach and the Campground) lost 13.2 cy/ft per year between 2004 and 2005, and the post-project rate has remained similar, at 14.5 cy/ft per year. Initially following nourishment, the erosion rate in the protected areas was high (15.5 cy/ft per year between 2006 and 2009) due to spreading of excess nourishment sand. Once the nourished areas eroded to the point where the groins were near the trapping capacity, the beach stabilized and the erosion rate fell to 0.7 cy/ft per year from 2009 to 2015.

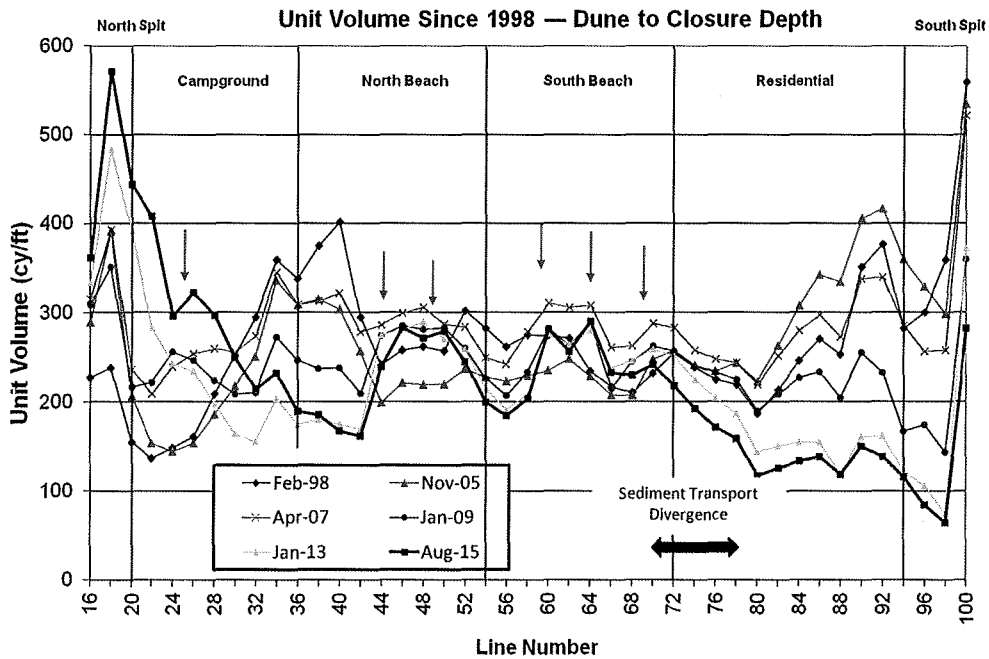


FIGURE 2. Beach unit volumes along Hunting Island from 1998 to 2015. The last nourishment project was completed in 2006. Groin locations are indicated by the red arrows.

Purpose and Rationale for the Project

The proposed project seeks to restore the beach along the Campground area as planned in the 2006/2007 project to protect park infrastructure and provide a stable recreational beach in that area. It also seeks to restore a section of beach which has chronically eroded and eliminated any dry sand or dune system between North Beach and South Beach recreational areas. New groins at the Campground (#2) and between North and South Beach (#5A) will stabilize the beach in those areas, reducing the erosion rate to manageable levels. Groin #5A, combined with Groins #4-8, will stabilize a contiguous ~7,500 linear foot continuous beach between the lighthouse and northern end of the lagoon and will also serve to protect the northern end of the South Beach parking area, which is presently being eroded.

Post project monitoring following the 2007 groin installation has proven that any potential downdrift impacts are limited to the areas immediately downdrift (i.e. north) of the groins and do not extend to the ends of Hunting Island or adjacent beaches, and that the groins are effective in maintaining a stable beach. Downdrift erosion will be ameliorated by filling the groins to capacity with nourishment sand and constructing them in a template following the natural beach slope, which will allow passage of sand over in addition to around the ends of the structures. Additionally, by restricting work to the north-central portions of the island (south of Groin #1 and north of Groin #8), no new impacts are anticipated to downdrift beaches.

The applicant will monitor the condition of the beach and performance of the groins following project construction. The applicant proposes the following monitoring plan:

- 1) Escarpment and compaction monitoring, typical of recent projects completed in South Carolina for a period of 3 years following the project.
- 2) Pre-project, post-project, and annual beach condition surveys for 5 years following construction. Surveys will extend the length of Hunting Island and profiles will be spaced no more than 500 ft apart with a minimum of 3 per groin cell. Profiles will extend in the cross shore direction from the dune to at least 1,500 ft seaward.
- 3) High-resolution vertical aerial imagery of Hunting Island, Harbor Island, and the northern end of Fripp Island pre-project, post-project, and in years 2 and 5 following construction.
- 4) Oblique aerial imagery annually following the project for a period of 5 years.

Due to the similar nature of the borrow material to the native beach, the applicant does not consider benthic monitoring of the beach or borrow area to be beneficial. Several previous studies have shown that if compatible fill material is placed on the beach, recovery of the benthic community occurs within weeks to months (Van Dolah et al, 1998; Kana and Mohan, 1998; CZR, 2014).

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34. TYPE AND QUANTITY OF MATERIALS TO BE DISCHARGED

All excavations will involve beach-quality sand similar in texture to the native beach. Hunting Island consists of well-sorted, fine sand averaging ~0.20 mm diameter. Offshore borrow areas A and B contain sediment of similar size, averaging .217 and .173 mm, respectively. Mud content in areas A and B was measured at <3 % and <1 %% in areas A and B, respectively. Total volume of sediment excavated will depend on the available budget at time of construction. Handling losses are anticipated to be less than 10%, therefore the maximum excavated volume will not exceed 690,000 cy. The final layout of the borrow area will be submitted to state and federal agencies prior to construction.

TABLE 1. Composite mean grain size for cores in proposed borrow areas A and B (Sheets 06 and 08). The mean size is computed to a base dredging elevation of 8 ft below grade. [**weighted based on boring recovery length*]

Name	Area	Limits Feet	Water Dpth ft-NAVD	Grain Size Distributions			%Coarser Than 2 mm	% Mud	% Shell
				Mean (mm)	Std Dev. (mm)	Skewness			
HIN-10	A	0-4.4	-16.1	0.306	0.454	-0.267	1.7	15.9	9.0
HIN-12	A	0-7.5	-14.3	0.188	0.575	-0.806	0.5	nd	5.8
HIN-15	A	0-6.5	-14.1	0.194	0.571	-0.835	0.5	nd	4.3
HIN-16	A	0-6.7	-14.5	0.209	0.580	-0.857	0.6	nd	6.9
HIN-23	A	0-8.0	-13.3	0.195	0.596	-0.971	0.9	nd	5.1
HI-24	A	0-6.2	-15.5	0.205	0.537	-1.866	1.5	0.2	8.1
HI-25	A	0-8.0	-14.4	0.265	0.453	-0.988	2.5	0.4	11.6
HI-26	A	0-8.0	-14.7	0.208	0.503	-1.756	2.2	0.4	9.6
HI-27	A	0-8.0	-13.8	0.256	0.459	-1.035	1.7	0.2	9.4
HI-28	A	0-8.0	-13.2	0.186	0.545	-1.899	1.0	0.3	6.6
HI-29	A	0-7.0	-12.4	0.177	0.630	-1.721	0.2	0.2	4.9
HI-30	B	0-8.0	-10.5	0.165	0.674	-2.552	0.3	0.3	3.7
HI-32	B	0-6.5	-11.1	0.173	0.696	-2.283	0.1	0.2	4.6
HI-33	B	0-8.0	-10.6	0.180	0.689	-1.924	0.1	0.1	4.0

40. MITIGATION

The restorative nature of the project and the lack of impacts to freshwater or estuarine wetlands suggest that no mitigation for the action be required. The project will restore and preserve dry sand and dune habitat used by shorebirds and endangered species. Impacts of beach nourishment projects are well understood and, when designed properly and the site allows, limited to temporary impacts to the immediate beach and borrow area. The previous beach restoration project included construction of six (6) groins out of a total of nine (9) permitted. The groins reduced erosion rates along the high-use recreational areas of the Park, increased nourishment longevity, and reduced the frequency of dredging projects. Borrow areas have been selected to minimize placement of silt-sized particles on the beach, and to closely match the native grain size along the beach. The project is proposed to be constructed during periods of low biological activity to minimize impacts to benthic organisms and sea turtles. The applicant proposes that no mitigation should be required for the proposed project, as is the typical custom for beach nourishment activities.