



US Army Corps
Of Engineers
Wilmington District

PUBLIC NOTICE

Issue Date: August 1, 2014
Comment Deadline: September 1, 2014
Corps Action ID #: SAW-2012-00040

All interested parties are hereby advised that the Wilmington District, Corps of Engineers (Corps) has published in the Federal Register a Notice of Availability (NOA) for the Final Environmental Impact Statement (FEIS) for the Village of Bald Head Island Shoreline Protection Project on Bald Head Island, Brunswick County, North Carolina. This public notice serves to address requirements for public notification as contained in general regulatory statutes (i.e., 33CFR325-332) and those statutes (i.e., 33CFR230 and 40CFR1500) which outline requirements for compliance with the National Environmental Policy Act. The main purpose of the proposed project is to address erosion at the western end of South Beach and to thereby protect public infrastructure, roads, homes, beaches, dunes and wildlife habitat. The applicant's proposed action includes the construction of a 1,900-ft terminal groin as well as creation and maintenance of an updrift sand fillet on the western end of South Beach.

Current plans and location information are described below and shown on the attached plans. This Public Notice and all plans are also available on the Wilmington District Web Site at:

<http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/PublicNotices>

Applicant:

Village of Bald Head Island
c/o: Calvin Peck, Village Manager
Post Office Box 3009
Bald Head Island, North Carolina 28461-7000

Agent (if applicable):

Olsen Associates, Inc.
c/o: Erik J. Olsen
2618 Herschel Street
Jacksonville, Florida 32204

Authority

The Corps will evaluate this project to compare alternatives that have been carried forward for study pursuant to applicable procedures under Section 10 of the River and Harbors Act and Section 404 of the Clean Water Act (33 U.S.C. 1344). In order to more

fully integrate Section 404 permit requirements with the National Environmental Policy Act of 1969, and to give careful consideration to our required public interest review and 404(b)(1) compliance determination, the Corps is soliciting public comment on the merits of this proposal. This comment period is offered to allow agencies and the public the opportunity to provide comments on the FEIS and the applicant's proposed project.

Written comments on the FEIS will be received until September 1, 2014. The District Commander is not authorizing construction of a proposed terminal groin or any alternative under consideration at this time. A Department of the Army permit could be issued following a complete review of the proposal for compliance with our regulations and related laws, including assurance that impacts to the aquatic environment have been minimized to the maximum extent practicable and a compensatory mitigation plan for unavoidable impacts has been approved. This FEIS includes responses to comments received during public review of the Draft EIS (DEIS).

Location

Bald Head Island is located in Brunswick County, North Carolina at approximately 33°51' N, 78°00' W (see Figure 1). It is roughly 25 miles south of the City of Wilmington and 32 miles east of the South Carolina/North Carolina state line. It is the southernmost of the coastal barrier islands which form the Smith Island complex at the mouth of the Cape Fear River. The southeastern tip of the island is Cape Fear (also referred to as Cape Fear Point) from which Frying Pan Shoals extend seaward over 20 miles to the southeast.

The island's east and south shorelines, "East Beach" and "South Beach, front the Atlantic shoreline. The west shoreline, or "West Beach," fronts the Cape Fear River. A depositional spit feature known as the "Point" lies at the juncture of West Beach and South Beach (see Figure 1). The north side of the island is bounded by the Bald Head Creek estuary, Middle Island and Bluff Island. The Cape Fear River entrance, over one mile in width, separates Bald Head Island from Oak Island (or Caswell Beach).

Existing Site Conditions

A temporary sand-filled tube groin field was constructed by the Village of Bald Head Island (Village) along the westernmost portion of South Beach in March 1996, immediately following completion of a 1996 dredge disposal project constructed by the Wilmington District. Sixteen groins (sand-filled tubes) were constructed of geotextile material and filled with sand. These temporary groins were replaced by the applicant in 2005 and in 2009.

The Island’s gross volumetric sediment loss over the period from November 2000 to May 2011 (excluding East Beach) was approximately 4.363 million cubic yards (Mcy), or approximately 415,000 cy per year. During this period, the largest erosion impacts occurred at the west end of South Beach near the Cape Fear River entrance. Since 2001, the Wilmington District has placed approximately 4.09 Mcy on the South Beach shoreline from material dredged during the Cape Fear River channel deepening/widening project and three channel maintenance projects. In 2009, the Village dredged approximately 1.85 Mcy from Jay Bird shoals and placed this material onto South Beach and West Beach. In July 2011, the VBHI constructed an extension to groin no. 16 (located closest to the Cape Fear River Entrance). The need for this structure was due to erosion on the downdrift side of groin no. 16. In December 2011, the Village constructed approximately 350 ft. of sand bag revetment located downdrift of groin no. 16 in order to alleviate erosion impacts to the nearby adjacent dunes, roads, homes, habitat, and infrastructure. The Village recently placed approximately 140,000 cy of material at the western end of South Beach. The source of material for this project was Bald Head Creek Shoals. Most recently, during the Winter and early Spring of 2013, the maintenance dredging of the Federal channel has resulted in the disposal of approximately 1.525 Mcy along South Beach between Sta 44+00 and 150+00 and along a portion of West Beach.

Applicant’s Stated Purpose

The purpose of the proposed work is to address erosion at the western end of South Beach and to thereby protect public infrastructure, roads, homes, beaches, dunes and wildlife habitat.

Project Description

The Corps, in consultation with the Project Review Team (PRT), developed a range of alternatives to be considered in the FEIS. The range of alternatives includes considerations of various means by which to respond to the project need and associated objectives. An initial alternative identified during scoping, but not advanced further in the EIS analysis, included consideration of construction of a terminal groin without beach nourishment. As this alternative is not compliant with the provisions of State Senate Bill 151 and is not preferred from an engineering standpoint, it has been eliminated from further consideration. The remaining alternatives evaluated within the FEIS are identified in Table 1. Below:

Table 1. Project Alternatives

Alternative #1	No-Action (includes component of Status-Quo)
Alternative #2	Retreat
Alternative #3	Beach Nourishment/Disposal with Existing Sand Tube Groinfield to Remain in Place

Alternative #4	Beach Nourishment/Beach Disposal and Sand Tube Groinfield Removal
Alternative #5	Terminal Groin with Beach Nourishment/Beach Disposal (Sand Tube Groinfield Remaining)
Alternative #6	Terminal Groin with Beach Nourishment/Disposal (Removal of Sand Tube Groinfield)

Description of Alternatives

1. No Action/Status Quo Alternative

Under the No-Action Alternative, the Village would not implement any comprehensive action (or actions) to offset the on-going erosion of the western end of South Beach. The No-Action Alternative takes into consideration the existing or status quo condition. Disposal events occurring under the existing Wilmington Harbor Sand Management Plan (SMP) would occur. The current SMP anticipates roughly 2/3 of the total volumetric sand dredged from the channel would be placed on Bald Head Island. Under the No-Action Alternative, short-term stabilization measures such as the placement of emergency sand-bags for protection of structures imminently threatened by erosion and the maintenance of the existing sand-tube groinfield would occur. Furthermore, the no-action or status quo alternative would include use of beach scraping during the winter months to stabilize foredunes in critically eroded areas. The Village would also continue its program of sand fencing to promote dune formation and stabilization.

2. Retreat

Under the Retreat Alternative, the Village would identify high-risk areas for the development and implementation of a Managed Shoreline Retreat Plan (MSRP) that would ultimately provide for the unimpeded recession of the shoreline. The Plan would provide for the systematic removal of the sand tube groinfield and the demolition or relocation of residences, roads, and infrastructure, if land and funds are available, in advance of the shoreline recession. Thresholds would be identified to trigger the demolition or relocation of specific structures. As part of the retreat strategy, undeveloped lots of the interior sections of Bald Head Island would be identified and acquired for the explicit use of relocating homes. Unimproved lots potentially available for acquisition and structure relocation have been identified based upon several factors, including: distance from nine-year predicted shoreline position under the Retreat Alternative; condition of lot (i.e. unimproved); and relocation logistics (e.g. avoiding areas in maritime forest that would require additional clearing along narrow right-of-ways for structure transport).

3. Beach Nourishment/Disposal with Existing Sand Tube Groinfield to Remain in Place

Under Alternative #3, it is assumed that beach disposal would continue per the terms of the existing SMP. The Village would continue to design and implement independently-sponsored beach nourishment and beach disposal projects on an as-needed basis. While Federal Emergency Management Agency (FEMA) funds may be available to the Village to address sand losses subsequent to a declared disaster, FEMA support is not available for scheduled renourishment events.

Potential sand sources that may be considered in EIS include the following:

a. Wilmington Harbor Entrance Channel

Prior federal channel maintenance and disposal events conducted under the Wilmington Harbor SMP have demonstrated that the innermost segment of the Ocean Entrance Channel is a suitable source of beach-compatible material. Navigation channel surveys for three channel reaches (Smith Island Range, Baldhead Shoal Channel 1, and Baldhead Shoal Channel 2) continue to be conducted on bi-monthly intervals. Condition surveys performed by the Corps of Engineers in 2012 indicate the occurrence of continued shoaling in Smith Island Channel and Baldhead Shoal Reaches 1 and 2. Areas of pronounced decreases in channel depth resulting from shoaling represent suitable high quality sources for beach nourishment material.

b. Jay Bird Shoals

Jay Bird Shoals is a linear, ebb tidal feature of the Cape Fear River and is situated immediately west of the confluence of the current Wilmington Harbor entrance channel and the former, abandoned channel. Suitable sediment (i.e. beach compatible by North Carolina sediment standard criteria) has been previously identified throughout much of the shoal feature to an average depth of -22 ft NGVD. In 2009, the Village received federal and state authorizations to dredge up to 2 Mcy of material from Jay Bird Shoals. The permitted borrow site was approximately 158 acres and was located at the seaward end of the shoal. Prior to authorization of the final borrow site footprint, boundaries were refined to avoid and minimize disturbance to potential cultural and environmental resources. A 200-ft buffer was maintained around two areas containing potential shipwreck material. The final authorized borrow limits avoided shallow subtidal and intertidal habitat (Land Management Group, 2009).

Approximately 1.85 Mcy of material (measured volume from borrow site) was excavated and pumped to South Beach and West Beach during the Village-sponsored 2009/2010 beach restoration project. Based upon geotechnical evaluations completed in 2007, the Jay Bird Shoals permitted borrow area contained over 3 Mcy of beach quality material

(Olsen 2007). However, as indicated above, the final volume requested for the 2009/2010 project was 2 Mcy for a one-time nourishment event.

c. Bald Head Creek Shoals

The depositional shoal feature located at the mouth of Bald Head Creek (BHC) is a potential smaller volume sand source in the immediate vicinity of the Island. The creek mouth is located approximately 1600 linear feet north of the entrance to Bald Head Marina. BHC is a relatively small saltwater creek system (approximately 3.5 km from headwaters to mouth) subject to semidiurnal tidal flows. It is bordered to the south by Bald Head Island and to the north by Middle Island.

In November 2010, the Village received Federal and state authorization to dredge 100,000 cy of material from an approximate 21-acre borrow site at the mouth of BHC for the purpose of providing supplemental sand to a severely eroded segment of western South Beach. The permit was subsequently modified to allow for up to 140,000 cy of material to be excavated. The Village completed the dredge and nourishment work in March 2012. Monitoring of the borrow site is on-going for a period of up to 3 years post-construction. Given the relatively short-time period since project construction (one year), there has been no significant infilling or adjustment of the borrow site documented to date. The borrow site limits may be expanded to the north to allow for the excavation of approximately 200,000 cy of beach quality material.

d. Frying Pan Shoals

Frying Pan Shoals is a submerged extension of a cusped foreland (i.e. accretional feature formed by processes of longshore drift and prevailing wind and wave conditions). The shoals extend nearly 20 miles offshore from the eastern end of Bald Head Island. Early reconnaissance level sand resource evaluations conducted for the Cape Fear Region (Meisburger 1977) identified that “modern sediment accretion on the inner shelf appears to be largely restricted to the shoal fields off Cape Lookout and Cape Fear, and to inlet shoals along the coast.” It included exploratory density type seismic lines, as well as a limited number of cores and surficial grab samples. Based upon sediment core data collected as part of this early study, the most appropriate beach quality sand identified within the Cape Fear shoal field appeared to be sixteen (16) nautical miles offshore of Bald Head Island. It should be noted that sediment sampling for the study was relatively limited given the expansive area of Frying Pan Shoals. More recent evaluations conducted by the Corps as part of the General Reevaluation Report (GRR) for the Brunswick County Beaches Coastal Storm Damage Reduction Project indicate the presence of substantial volumes of “beach-compatible” material. However, in correspondence received on 9, 2014, the National Marine Fisheries Service (NMFS) stated that the use of Frying Pan Shoals may be included in the Final EIS provided there is a commitment to reinitiate Essential Fish Habitat consultation with NMFS should the Village actually pursue mining sand from this area.

4. Beach Nourishment/Beach Disposal and Sand Tube Groinfield Removal

Under this alternative, beach disposal would continue per the terms of the existing SMP, and the Village would implement supplementary beach nourishment and/or beach disposal projects on intervals sufficient to accomplish the stated Purpose and Need. In addition, the Village would terminate maintenance of the sixteen (16) sand-filled tube groinfield or seek means by which it would be removed. Removal of the sand-filled geotextile tubes and associated underlayments would require excavation with heavy machinery and sand tube clearing via hydraulic means (i.e. washing of sand from each tube structure). Sand tube removal can occur only subsequent to a beach fill operation in order to ensure a sandy shorefront immediately upon removal. Similarly, excavation of the structures – essentially in the “dry” after a fill project – ensures both complete and relatively cost-effective removal. The potential sand sources required for this Alternative are the same as those identified under Alternative #3.

5. Terminal Groin with Beach Nourishment/Beach Disposal (Sand Tube Groinfield Remaining)

Alternative #5, the applicant’s preferred alternative, includes the construction of a 1,900 linear foot (lf) terminal groin concurrent with, and following a federal beach disposal operation on Bald Head Island. The structure would be constructed in two phases (as discussed below) and would serve as a “template” for fill material placed eastward thereof. Federal beach disposal activities on South Beach typically proceed from west to east. Historically, the westernmost limit of direct federal beach disposal in proximity to the channel (by design specification) has been approximately South Beach baseline station 44+00.

As required by current North Carolina General Statute, the construction of a terminal groin would necessarily involve the placement and maintenance of a concurrent beach fillet (NC Session Law 2013-384). The concurrent beach fillet would be achieved via disposal from an approved source site. As indicated above, the proposed source site for the fillet is sand disposal from the Wilmington Harbor navigation project. Additional sand source sites proposed by the applicant for maintenance and future Village-sponsored nourishment are: (1) Jay Bird Shoals; (2) reaches of the Wilmington Harbor Channel demonstrated to contain beach-compatible material (i.e. Baldhead Shoal Channel 1, Baldhead Shoal Channel 2, and Smith Island Channel); (3) Bald Head Creek Shoal; and (4) Frying Pan Shoals.

Construction Phasing: In order to expedite beneficial post-groin shoreline equilibration conditions (both updrift and downdrift of the structure, and including formation of the sand fillet), the terminal groin would be constructed in two phases. Phase I would involve the construction of an approximate 1,300-lf structure (approximately 2/3 of the structure’s overall design length) coincident with the federal beach disposal. Phase II would extend the seaward end of the structure to complete the structure’s overall design

length. It is estimated that the timing of the Phase II groin construction would be based upon two to four years of performance monitoring. The implementation of Phase II would be coordinated with agencies subsequent to the submittal of physical monitoring data. Physical monitoring is described in more detail in the EIS.

It is presently estimated that a Phase I (1,300 ft long) terminal groin, constructed without the need for a hydraulically placed fillet, could theoretically begin in November or December of the construction season but would in all probability extend at least 3 months past the 1 May 2015 moratorium observed to minimize impacts to nesting sea turtles. Certain construction activities associated with terminal groin construction can begin prior to beach disposal operations. They are principally limited however to stone transport and stockpiling at the site, installation of a construction trestle (if deemed necessary), excavation and limited placement of structure foundation mattresses and armor rock (above the MLWL).

If implemented concurrent with the Federal disposal, it is possible that the Phase I structure may not require any additional sand from a supplemental source site. At the least, a Phase I structure would reduce both the initial volume of sand required, as well as potentially the timing of updrift fillet enhancement (if necessary) by approximately six months to one year.

6. Terminal Groin with Beach Nourishment/Disposal (Removal of Sand Tube Groinfield)

Alternative #6 would involve the construction of a single, low-profile terminal groin as described in Alternative #5 above. However, upon completion of the installation of the terminal groin, the Village would begin the systematic removal of the existing sand-tube groinfield on South Beach. Sand placement via Village-sponsored nourishment projects and federal beach disposal would continue on periodic intervals.

Avoidance and Minimization

Efforts to avoid and minimize effects on aquatic resources will be evaluated during the analysis of alternatives and prior to permit decision.

Compensatory Mitigation

The project will have no direct or indirect effects on wetlands. No compensatory mitigation to offset unavoidable functional loss to the aquatic environment is proposed. Avoidance and minimization measures proposed by the applicant are described in the FEIS. Rationale for not including construction moratoria are described in the FEIS.

Other Related Federal Laws

Since, distribution of the DEIS in January 2014, the Corps has concluded consultation with the appropriate Federal and State resource agencies on the following Federal laws: National Historic Preservation Act – State Historic Preservation Officer, Endangered Species Act-U.S. Fish and Wildlife Service; and the Magnuson-Stevens Fisheries Conservation and Management Act – NMFS. Consultation with NMFS Protected Resources Division regarding the project’s effects on Atlantic sturgeon and marine sea turtles is pending.

Other Required Authorizations

This notice and all applicable application materials are being forwarded to the appropriate State agencies for review. The Corps will generally not make a final permit decision until the North Carolina Division of Water Quality (NCDWQ) issues, denies, or waives State certification required by Section 401 of the Clean Water Act (PL 92-500). The receipt of the application and this public notice combined with appropriate application fee at the North Carolina Division of Water Quality central office in Raleigh will constitute initial receipt of an application for a 401 Water Quality Certification. A waiver will be deemed to occur if the NCDWQ fails to act on this request for certification within sixty days of the date of the receipt of this notice in the NCDWQ Central Office. Additional information regarding the Clean Water Act certification may be reviewed at the NCDWQ Central Office, 401 Oversight and Express Permits Unit, 2321 Crabtree Boulevard, Raleigh, North Carolina 27604-2260. All persons desiring to make comments regarding the application for certification under Section 401 of the Clean Water Act should do so in writing delivered to the North Carolina Division of Water Quality (NCDWQ), 1650 Mail Service Center, Raleigh, North Carolina 27699-1650 Attention: Ms Karen Higgins by September 1, 2014.

The applicant has not provided to the Corps, a certification statement that his/her proposed activity complies with and will be conducted in a manner that is consistent with the approved North Carolina Coastal Zone Management Program. Pursuant to 33 CFR 325.2(b)(2), the Corps cannot issue a permit for the proposed work until the applicant submits such a certification to the Corps and the North Carolina Division of Coastal Management (NCDCM), and the NCDCM notifies the Corps that it concurs with the applicant’s consistency certification.

Evaluation

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. 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

proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal 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 (in accordance with Executive Order 11988), land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving the discharge of dredged or fill materials in waters of the United States, the evaluation of the impact of the activity on the public interest will include application of the Environmental Protection Agency's 404(b)(1) guidelines.

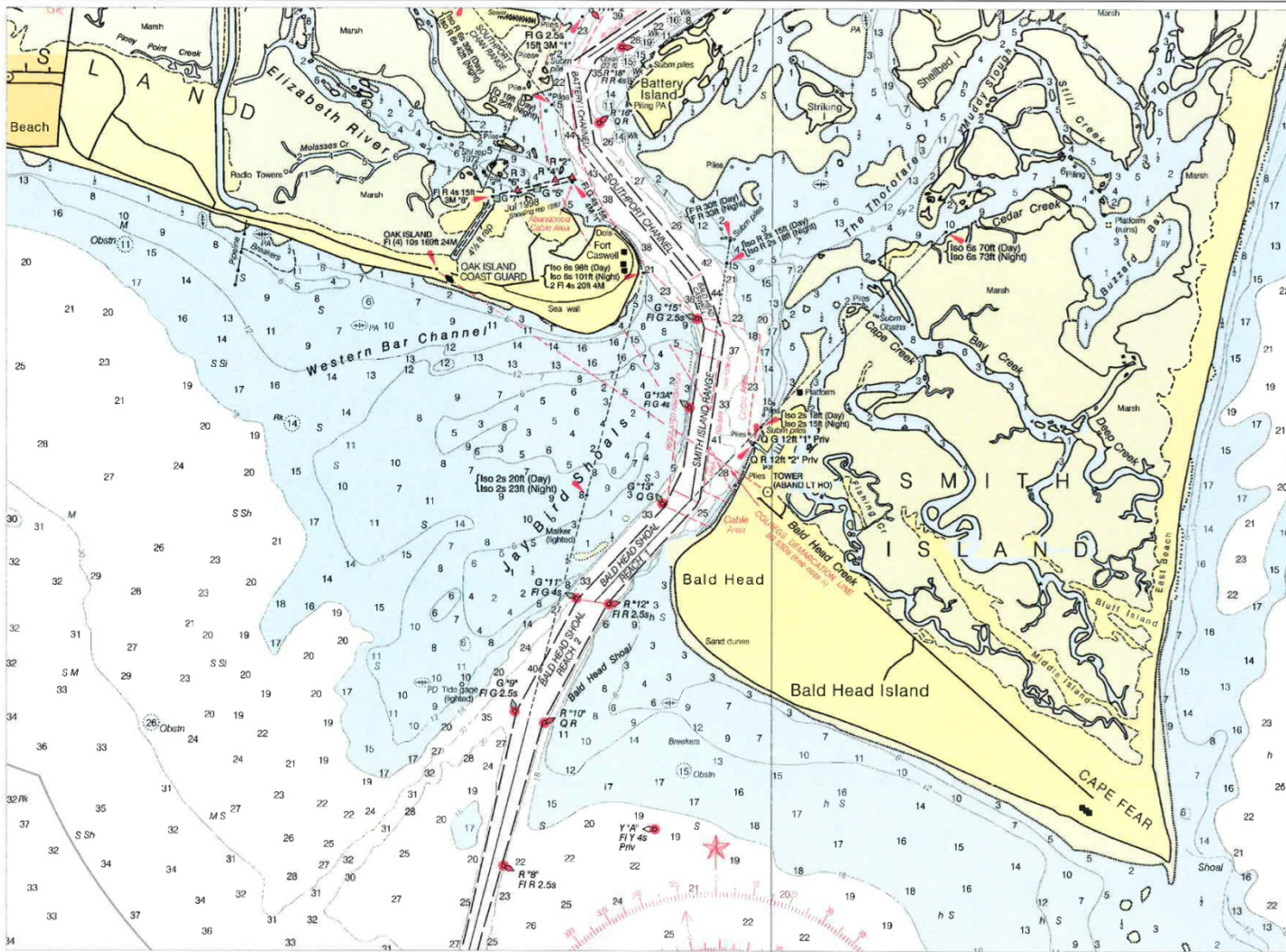
Commenting Information

This notice announces that we have distributed a Notice of Availability for the FEIS which will be published in the Federal Register on August 1, 2014 and can be found in the Federal Register at the following website:

<http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=FR>

After connecting with the website, click through the dates to August 1, 2014. Click on "Defense Department" and then locate the Village of Bald Head Island Shoreline Protection Project under "Notices."

As disclosed in the NOA, any written comments pertinent to the proposed work, as outlined above, will be received by the Corps of Engineers, Wilmington District, until **September 1, 2014**. Comments should be submitted to Mr. Ronnie Smith, Wilmington Regulatory Field Office, 69 Darlington Ave., Wilmington, North Carolina 28403-1343, or (910) 251-4829, or by email at: ronnie.d.smith@usace.army.mil.

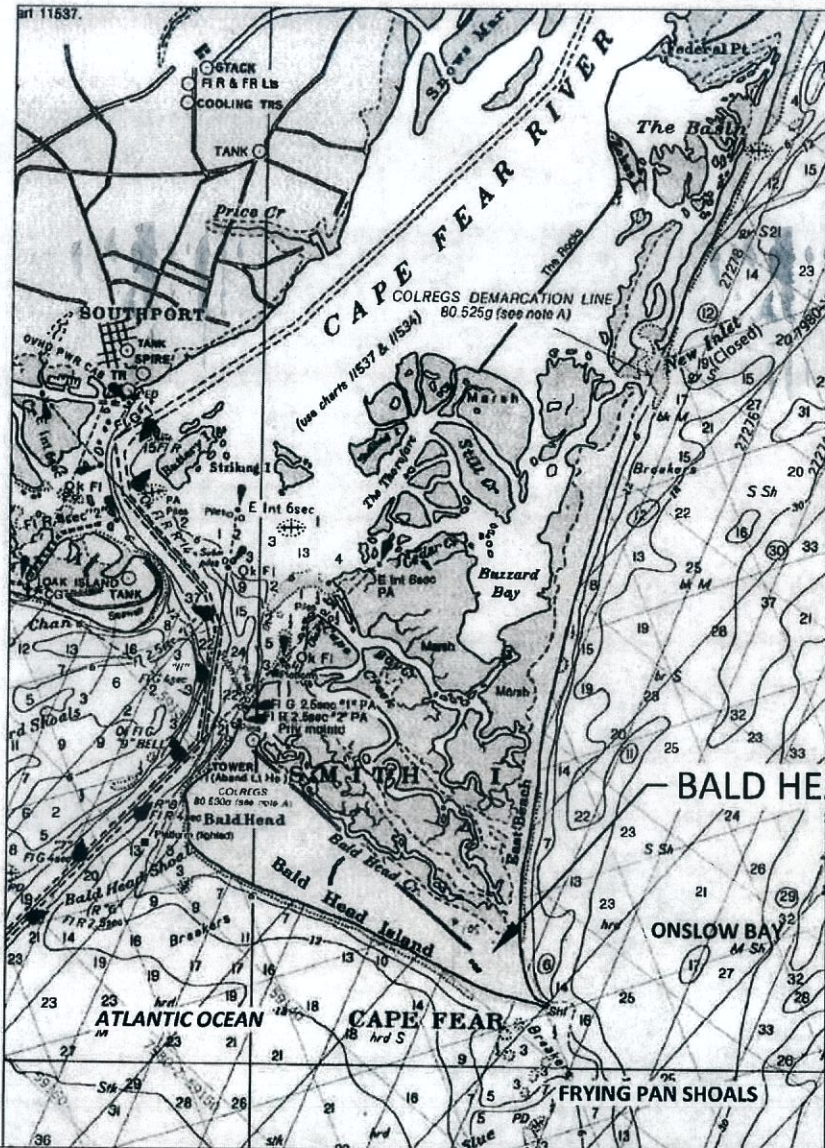


Base map is NOAA navigation chart 11537 obtained from www.charts.noaa.gov (ENC chart US5NC12M).



Project: **Village of Bald Head Island
Shoreline Protection Project
Draft Environmental Impact Statement**

Title: **VICINITY MAP**



APPLICANT:
 VILLAGE OF BALD HEAD ISLAND

 ENGINEER:
 OLSEN ASSOCIATES, INC.

 AGENT:
 ERIK J. OLSEN, P.E.



DATUM: MLLW

NTS



NOT FOR PURPOSES OF CONSTRUCTION



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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

PROJECT LOCATION

DATE	APPROVED	REVISION

09/30/2013

DRAWN BY:
 ML

SHEET
 1 of 21



- NOTES:
- 1) MAXIMUM GROIN LENGTH IS 1900 FT.
 - 2) FILLET NOT SHOWN

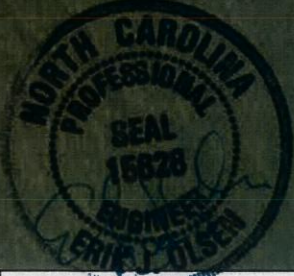
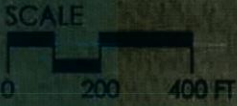


PHOTO - MAY, 2012

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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
GROIN DESIGN SECTION LOCATIONS

DATE	APPROVED	REVISION
		09/30/2013
DRAWN BY: ML		
SHEET 4 of 21		

TIDAL DATUMS

MHHW = 2.82 FT
 MHW = 2.51 FT
 MTL = 0.35 FT
 NGVD = 0.00 FT
 MLW = -1.81 FT
 MLLW = -1.98 FT

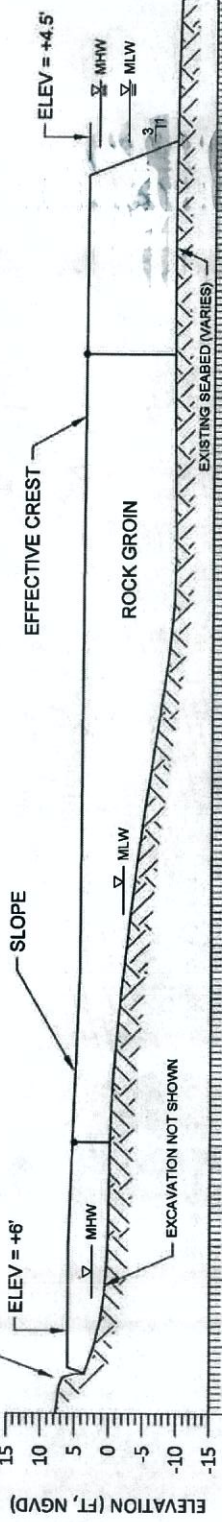
ATLANTIC OCEAN

LANDWARD ← → SEAWARD

LOCATION OF GROIN TERMINATION MAY VARY
 DEPENDING UPON BEACH CONDITIONS AT TIME
 OF CONSTRUCTION

HEAD

STEM



NOTE: DISTORTED SCALE

CENTERLINE SECTION (D-D)

- NOTES:
- 1) NOT FOR PURPOSES OF CONSTRUCTION
 - 2) FINAL DESIGN ELEVATIONS MAY VARY
 - 3) THE STRUCTURE STEM MAY HAVE MULTIPLE SLOPES AND ELEVATIONS
 - 4) LENGTH IS COMPUTED ALONG GROIN CENTERLINE
 - 5) GROIN LENGTH IS NOT SHORE NORMAL
 - 6) THE STRUCTURE MAY BE CONSTRUCTED IN TWO PHASES
 - 7) A TEMPORARY TRESTLE MAY BE INSTALLED DURING THE PERIOD OF CONSTRUCTION
 - 8) TOTAL STRUCTURE LENGTH: 1900 FT



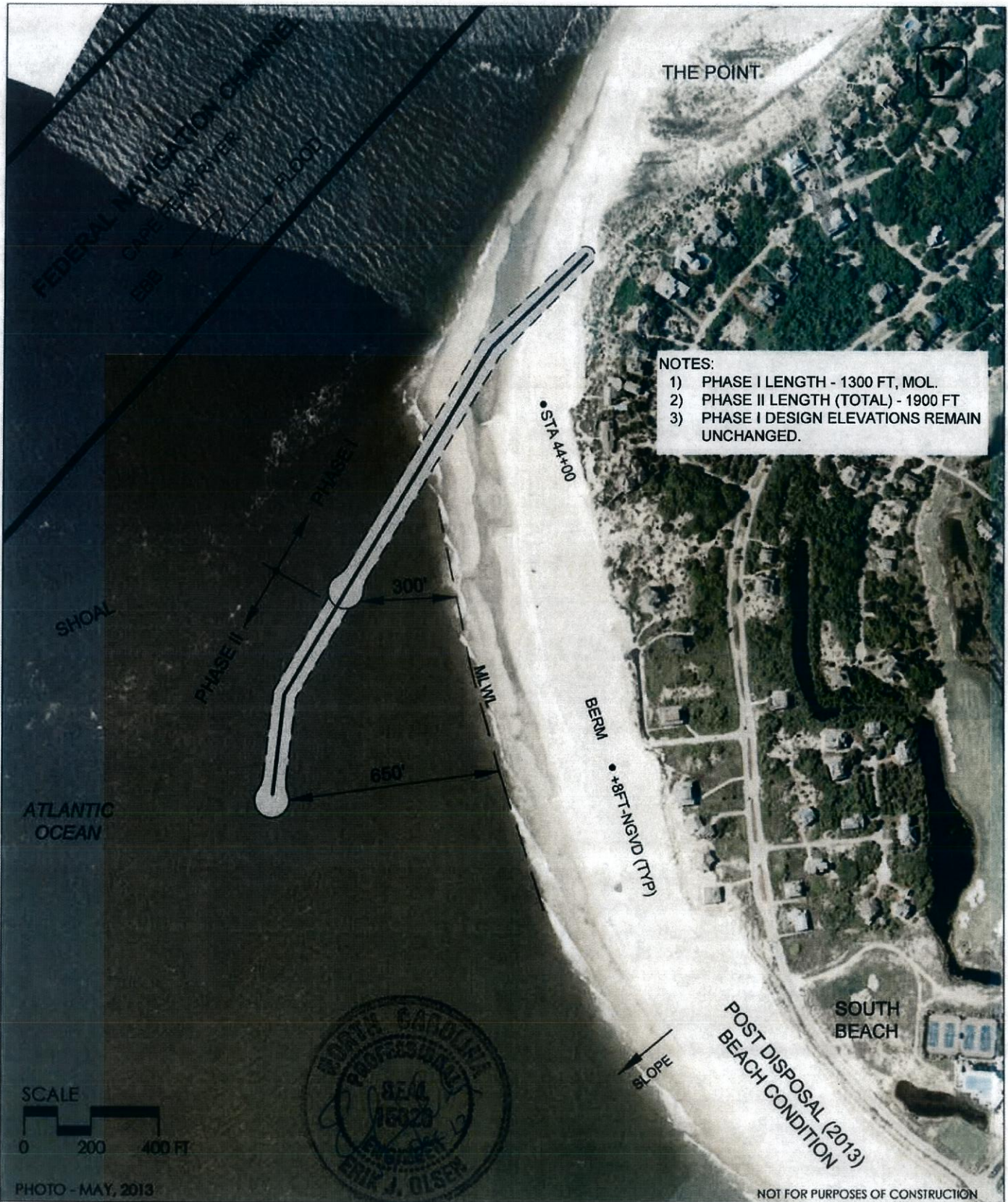
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

GROIN PROFILE

DATE	APPROVED	REVISION
09/30/2013		
DRAWN BY: ML		
SHEET 6 of 21		



- NOTES:
- 1) PHASE I LENGTH - 1300 FT, MOL.
 - 2) PHASE II LENGTH (TOTAL) - 1900 FT
 - 3) PHASE I DESIGN ELEVATIONS REMAIN UNCHANGED.

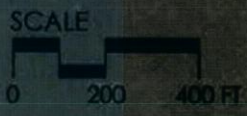


PHOTO - MAY, 2013



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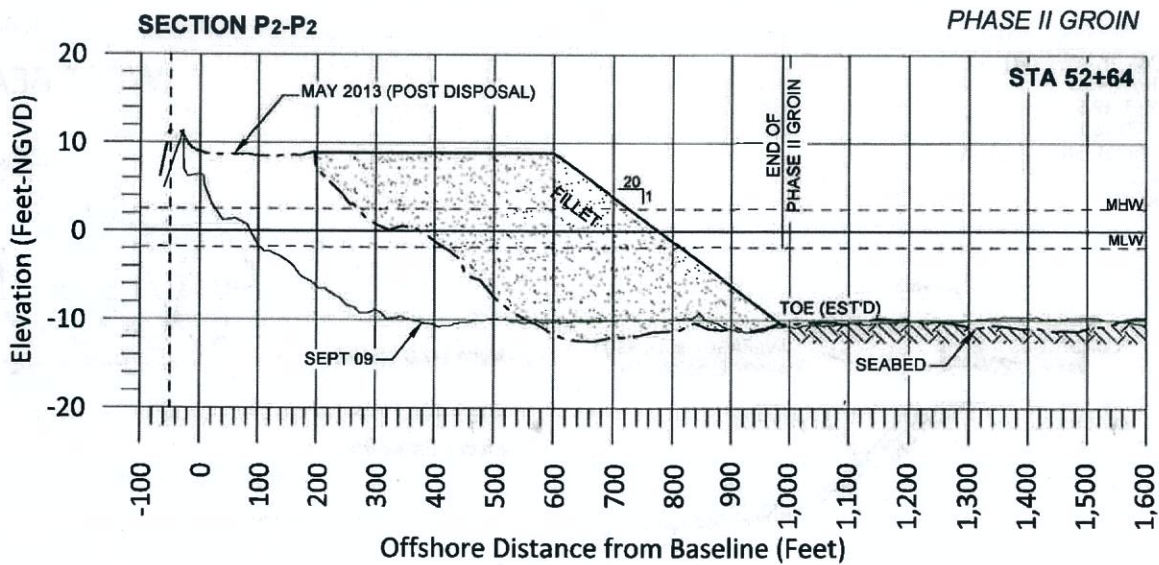
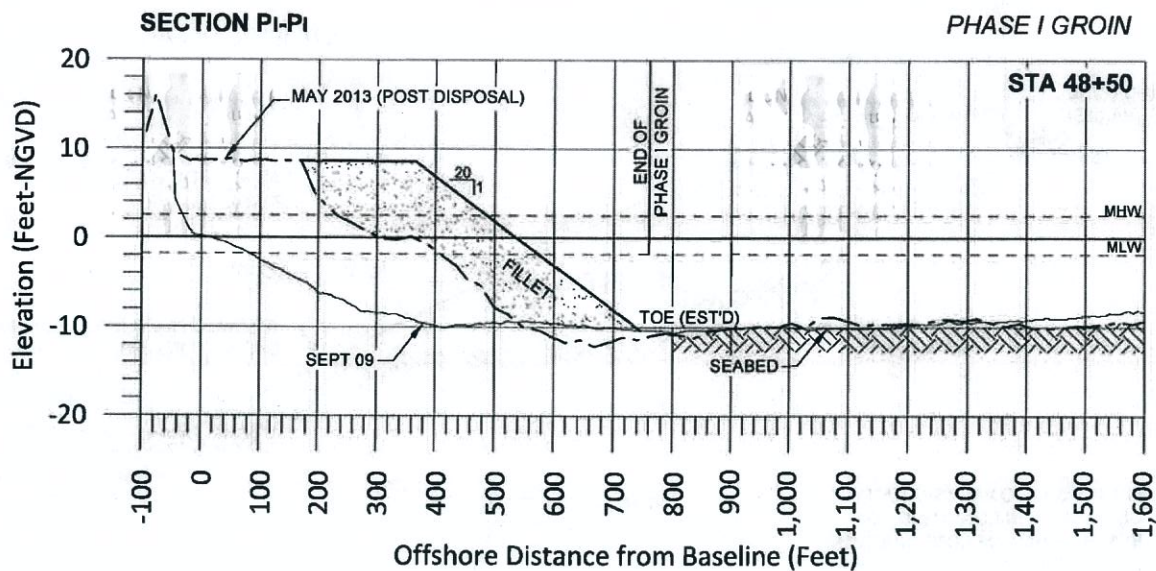


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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

PHASED GROIN PLAN

DATE	APPROVED	REVISION
		09/30/2013
		DRAWN BY: ML
		SHEET 8 of 21



NOTES:

1. SEPT. '09 SURVEY FOR REFERENCE ONLY
2. MAY '13 SURVEY - POST DISPOSAL



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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

SAND FILLET SECTIONS

APPROVED FOR CONSTRUCTION

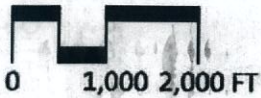
09/30/2013

DRAWN BY:
ML

SHEET
10 of 19



SCALE



NOTES:

- 1) PROJECT BASELINE UTILIZED FOR BEACH MONITORING AND FEDERAL BEACH DISPOSAL PROJECT CONSTRUCTION BY WILMINGTON DISTRICT, USACOE
- 2) ACTUAL LIMITS OF FILL PLACEMENT BY VILLAGE FOR MITIGATION OR FILLET MAINTENANCE SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF S.B. 110.
- 3) STA 44+00 IS TYPICAL WESTERN LIMIT OF FEDERAL S. BEACH DISPOSAL.

BALD HEAD ISLAND

EAST BEACH

CAPE FEAR

- STA 218+00
- STA 214+00
- STA 210+00
- STA 206+00
- STA 202+00
- STA 198+00
- STA 194+00
- STA 190+00
- STA 186+00
- STA 182+00
- STA 178+00
- STA 174+00
- STA 170+00
- STA 166+00
- STA 162+00
- STA 158+00
- STA 154+00
- STA 150+00
- STA 146+00
- STA 142+00
- STA 138+00
- STA 134+00
- STA 130+00
- STA 126+00
- STA 122+00
- STA 118+00
- STA 114+00
- STA 110+00
- STA 106+00
- STA 102+00
- STA 97+10
- STA 92+15
- STA 88+23
- STA 84+16
- STA 76+37
- STA 73+39
- STA 69+46
- STA 65+50
- STA 60+51
- STA 56+56
- STA 52+64
- STA 46+89
- STA 44+00
- STA 40+00
- STA 36+00
- STA 32+00
- STA 28+00
- STA 24+00
- STA 20+00
- STA 16+00
- STA 12+00
- STA 08+00
- STA 04+00
- STA 00+00

SOUTH BEACH

LIMITS OF FUTURE PROJECT RELATED FILL ACTIVITIES BY VILLAGE (SEE NOTE 2)

PROJECT BASELINE (STA 00+00)

WEST BEACH

THE POINT



OCTOBER 2006 PHOTOGRAPHY

NOT FOR PURPOSES OF CONSTRUCTION

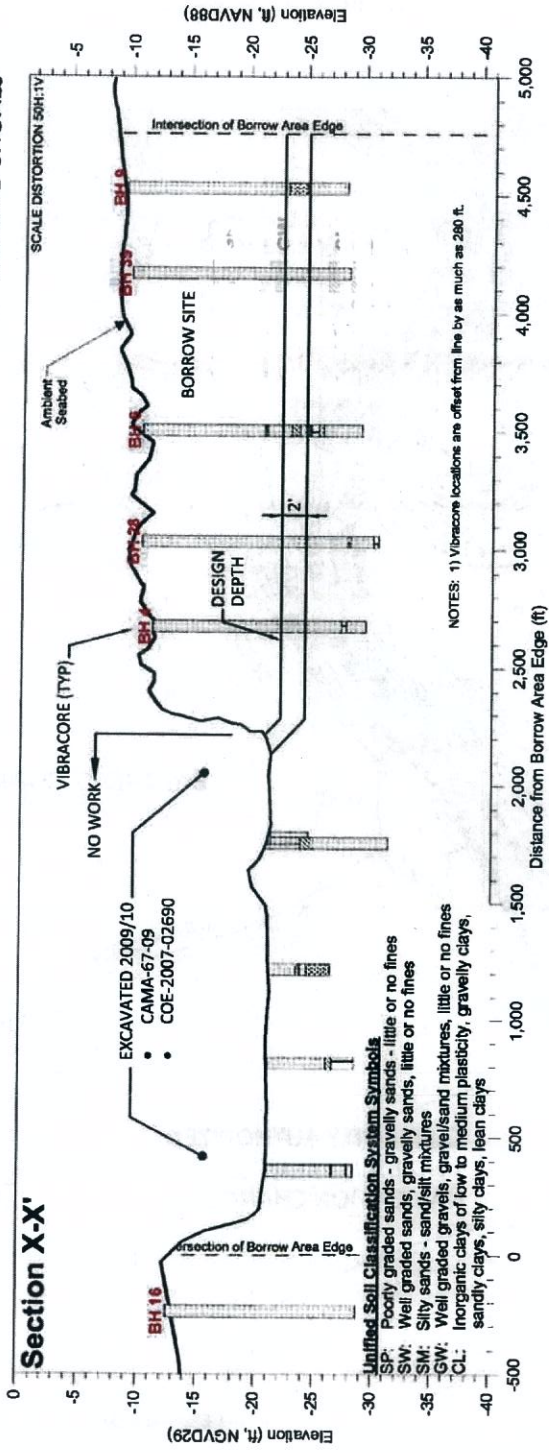


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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
**PROJECT BASELINE
 AND LIMITS OF FILL**

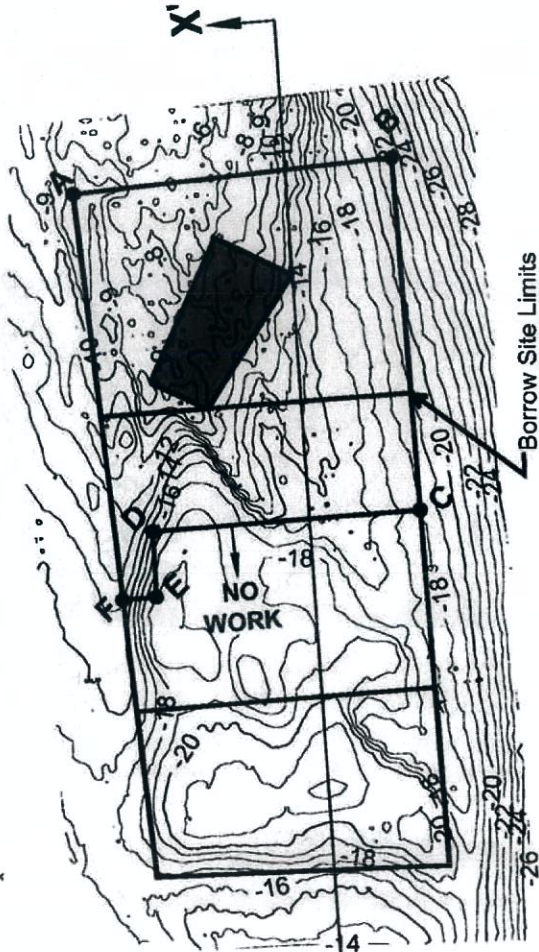
DATE	APPROVED	REVISION
DRAWN BY: ML		
SHEET 12 of 19		

JAY BIRD SHOALS



SOIL LEGEND

SP	SW	SM	GW	CL
----	----	----	----	----



SCALES: AS SHOWN

SECTION X-X' LOCATION

BORROW SITE
 DESIGN DEPTH -22 NGVD29
 ALLOWABLE OVERDEPTH -2FT (I.E. -24 FT NGVD29)
 SURVEY - MAY, 2013

NOT FOR PURPOSES OF CONSTRUCTION

JAY BIRD SHOALS BORROW SITE

olsen
 associates, inc.
 2618 Herschel Street
 Jacksonville, FL 32204
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
BORROW SITE TYPICAL SECTION

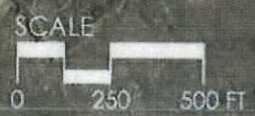
APPROVED FOR CONSTRUCTION
 ERIK J. OLSEN
 PROFESSIONAL ENGINEER
 STATE OF FLORIDA
 LICENSE NO. 186263

09/30/2013
DRAWN BY: ML
SHEET 16 of 21



SURVEY: NGVD 29
 PHOTO: MAY 2013

Borrow Site Limits		
ID	N	E
A	51,529	2,305,798
B	50,320	2,305,393
C	49,522	2,305,127
D	49,385	2,303,805
E	50,435	2,304,110
F	51,660	2,304,466
ACDFA - 65.1A		
ABEFA - 37.6A		



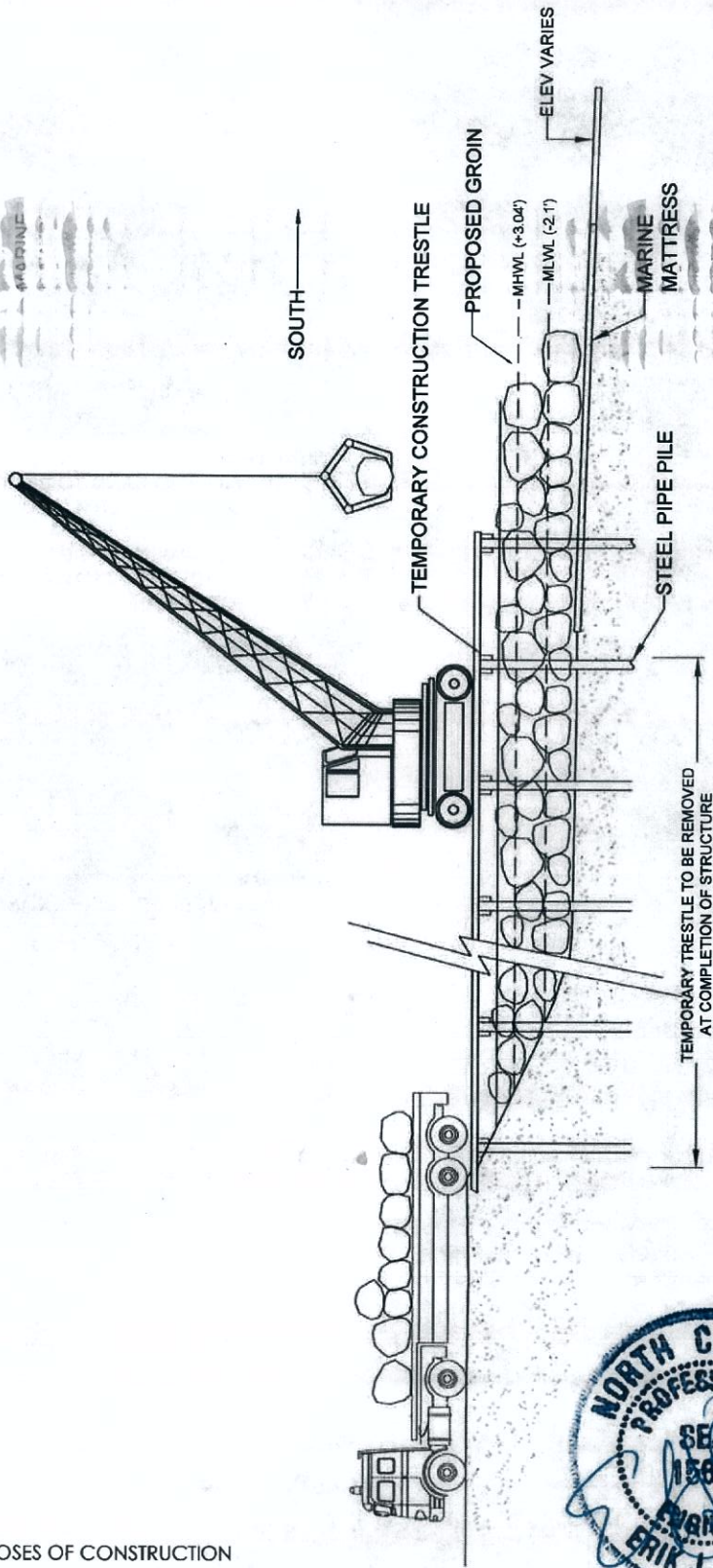
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
**BALD HEAD CREEK
 BORROW AREA**



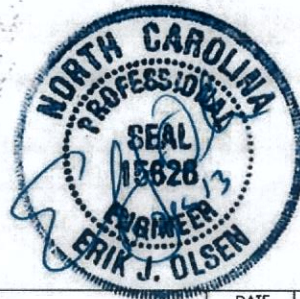
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		10/18/13
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SHEET 18 of 21		



TYPICAL TRESTLE INSTALLATION - OPTIONAL

- NOTE:
- 1) TRESTLE SHALL BE CONSTRUCTED ALONGSIDE ROCK GROIN.
 - 2) TRESTLE LENGTH TO BE DETERMINED BY BEACH CONDITIONS AT TIME OF CONSTRUCTION.
 - 3) TRESTLE MAY NOT ENTER CULTURAL RESOURCE BUFFER AREA (SEE SHEET 3).
 - 4) ALL TRESTLE MATERIAL TO BE REMOVED FROM SITE.



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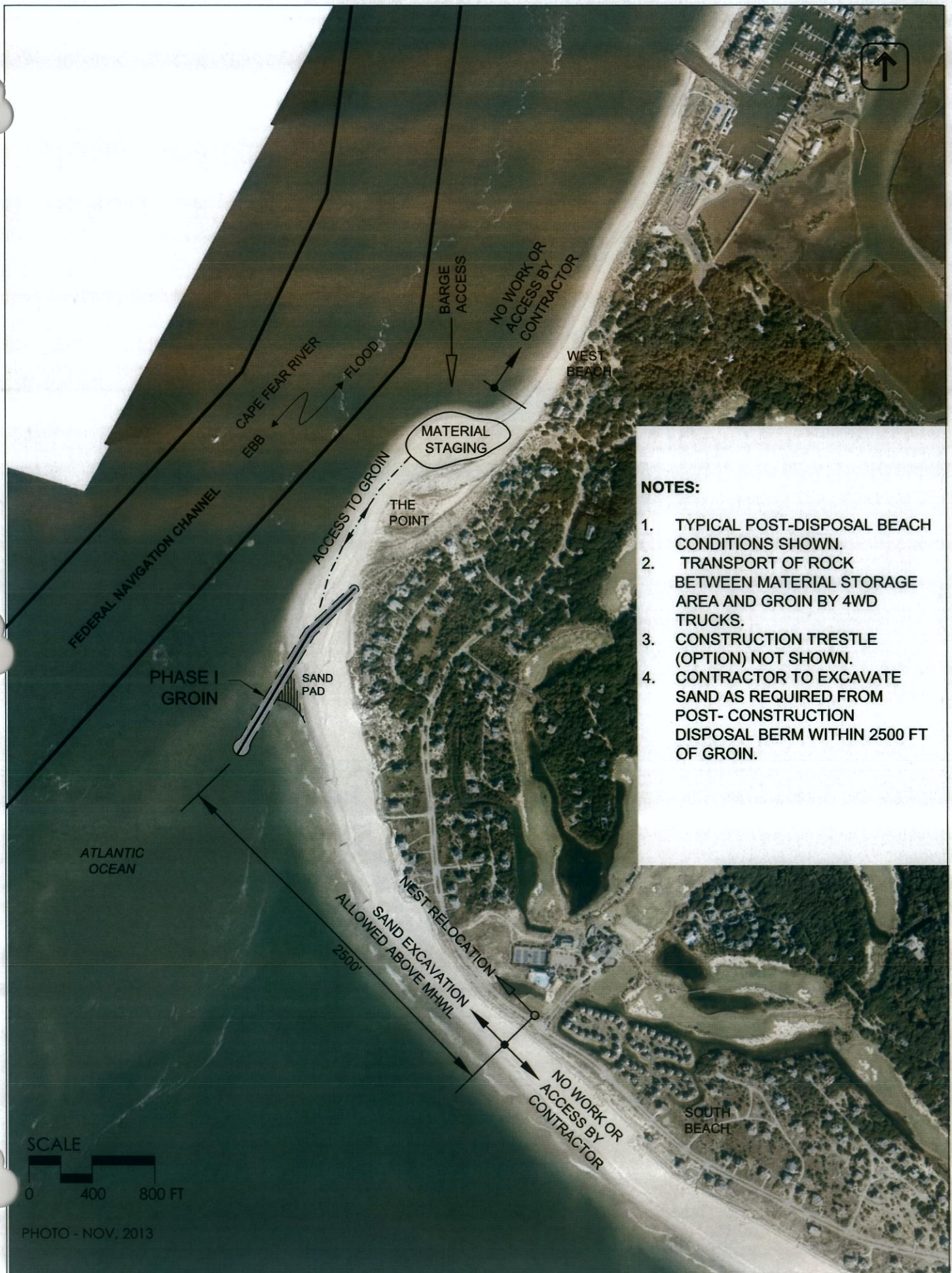


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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

TEMPORARY TRESTLE

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SHEET 20 of 21		



NOTES:

1. TYPICAL POST-DISPOSAL BEACH CONDITIONS SHOWN.
2. TRANSPORT OF ROCK BETWEEN MATERIAL STORAGE AREA AND GROIN BY 4WD TRUCKS.
3. CONSTRUCTION TRESTLE (OPTION) NOT SHOWN.
4. CONTRACTOR TO EXCAVATE SAND AS REQUIRED FROM POST- CONSTRUCTION DISPOSAL BERM WITHIN 2500 FT OF GROIN.

Figure 3.3. Terminal Groin/Fillet Work Area and Groin Construction Activities (Phase I)
 (courtesy Olsen Associates, Inc.)