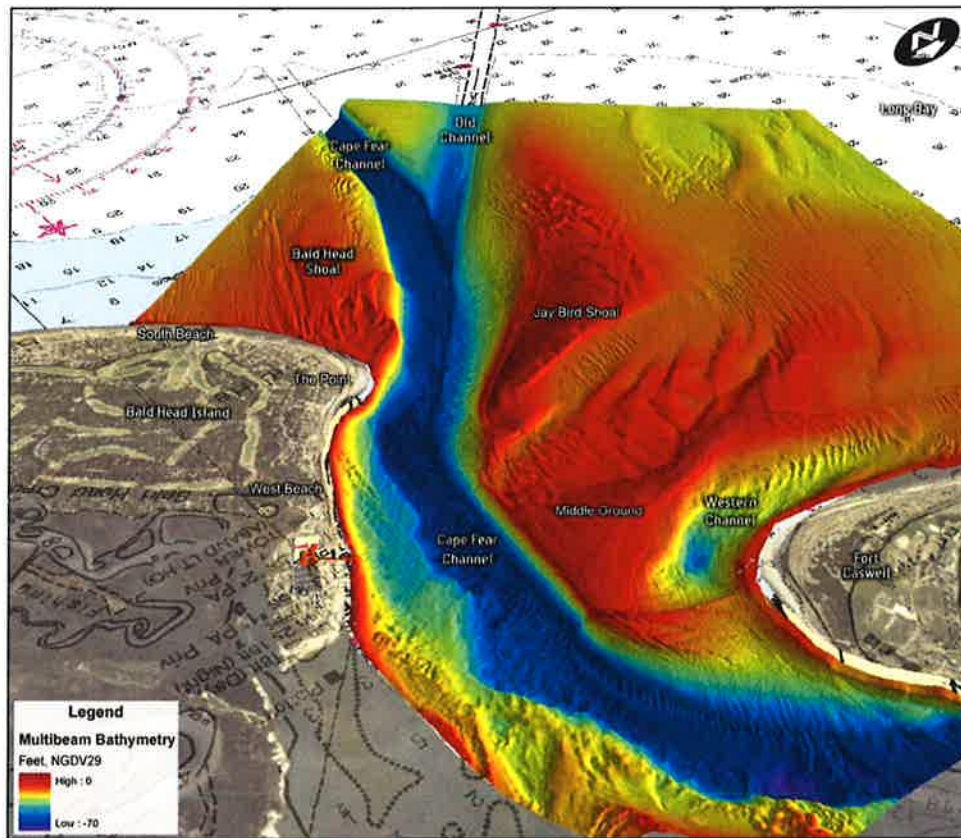


VILLAGE OF BALD HEAD ISLAND, N.C.

CAMA MAJOR PERMIT APPLICATION FOR A

TERMINAL GROIN PROJECT



SURVEY BY GEODYNAMICS

SUBMITTED TO:

N.C. DIVISION OF COASTAL MANAGEMENT
WILMINGTON DISTRICT
127 CARDINAL DR. EXT.
WILMINGTON, N.C. 28405-3545

APPLICANT:
VILLAGE OF BALD HEAD ISLAND, N.C.

SUBMITTED BY:
OLSEN ASSOCIATES, INC.
JACKSONVILLE, FL
C-1468



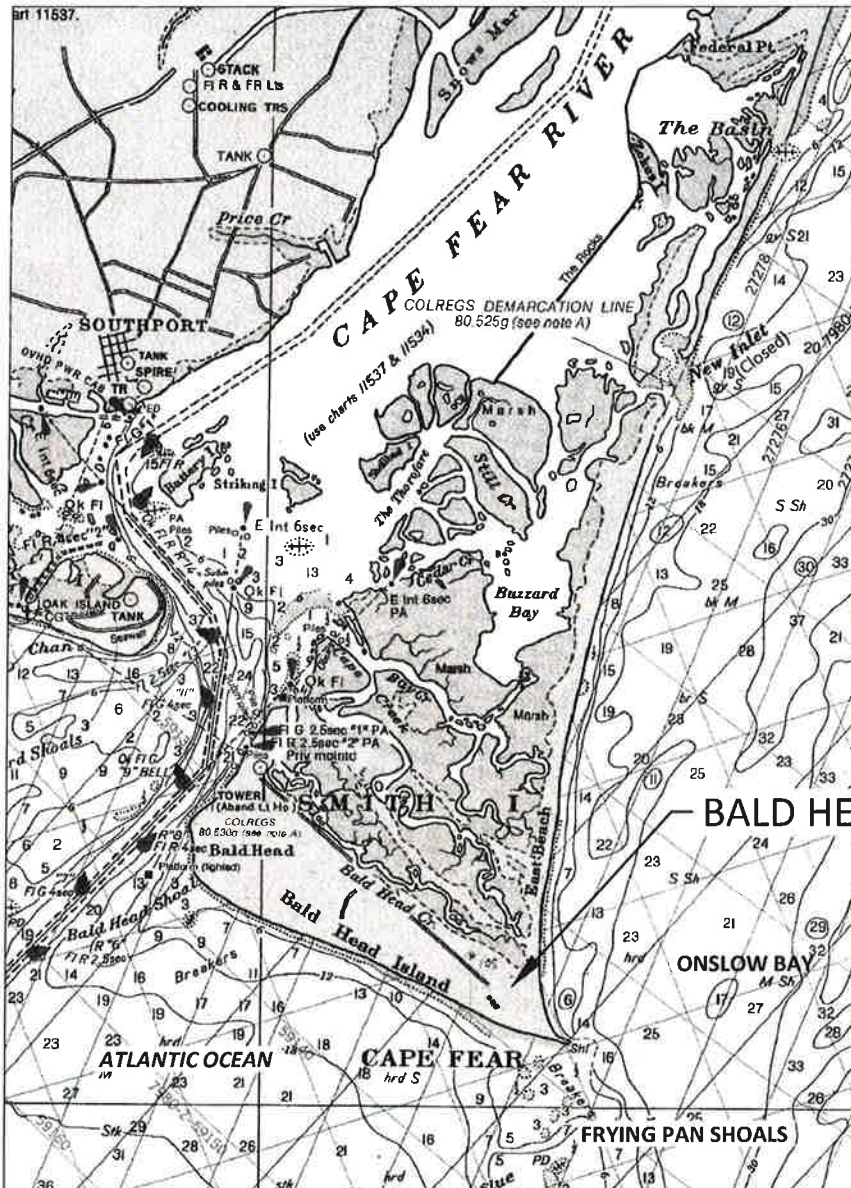
APPLICANT:
VILLAGE OF BALD HEAD ISLAND

ENGINEER:
OLSEN ASSOCIATES, INC.

AGENT:
ERIK J. OLSEN, P.E.



DATUM: MLLW



NTS



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SITE

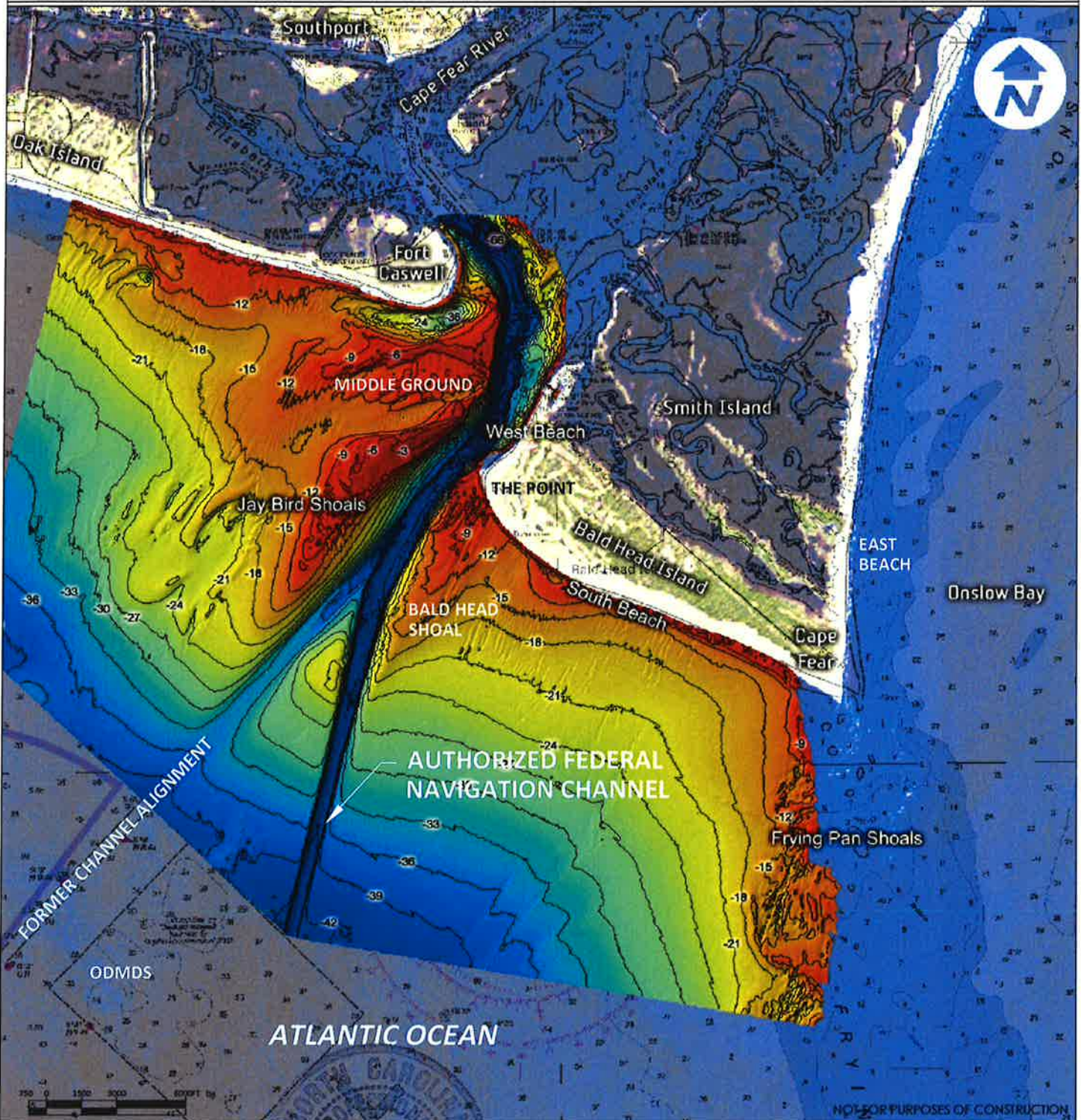


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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

PROJECT LOCATION

DATE	APPROVED	REVISION
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2006 CONTOUR DATUM: NGVD 29
NAUTICAL CHART DATUM: MLLW



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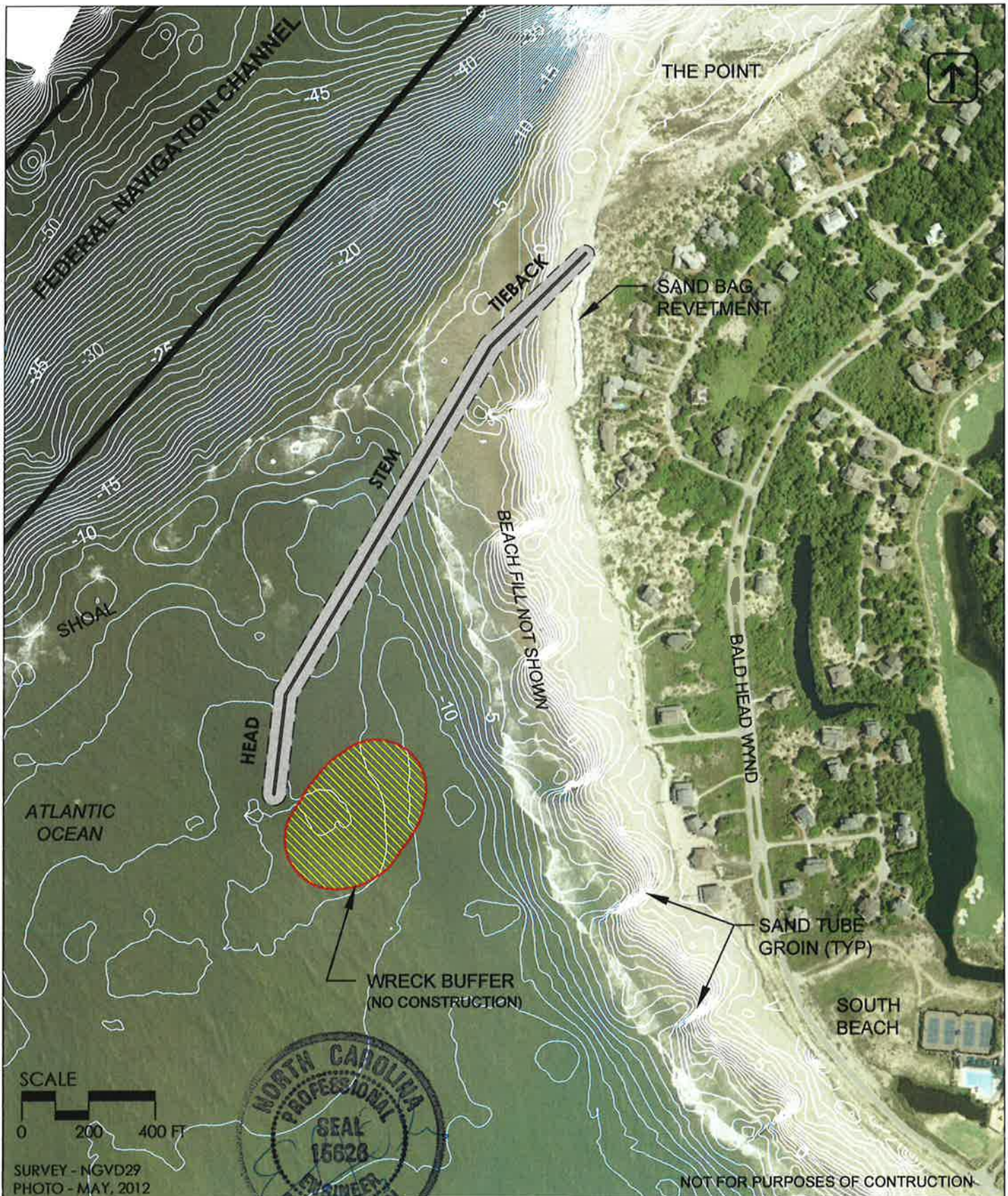
VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

SITE CONDITIONS

2006 SURVEY-GEODYNAMICS, INC

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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT
GROIN LOCATION AND CONFIGURATION

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VILLAGE OF BALD HEAD ISLAND TERMINAL GROIN PROJECT

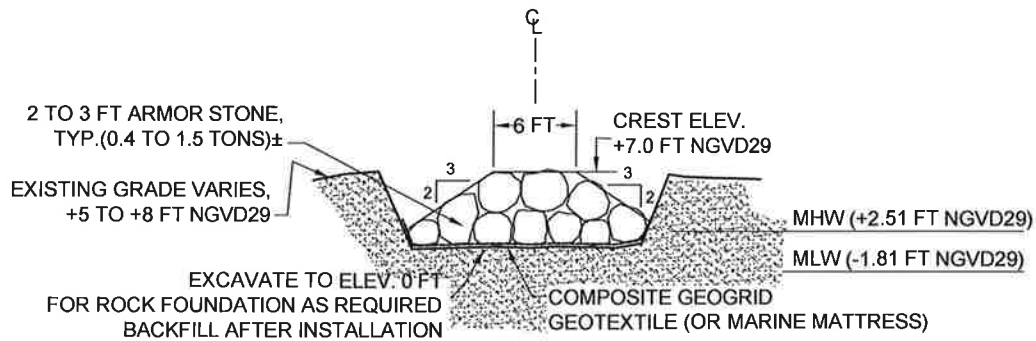
GROIN DESIGN SECTION LOCATIONS

DATE	APPROVED	REVISION

09/30/2013

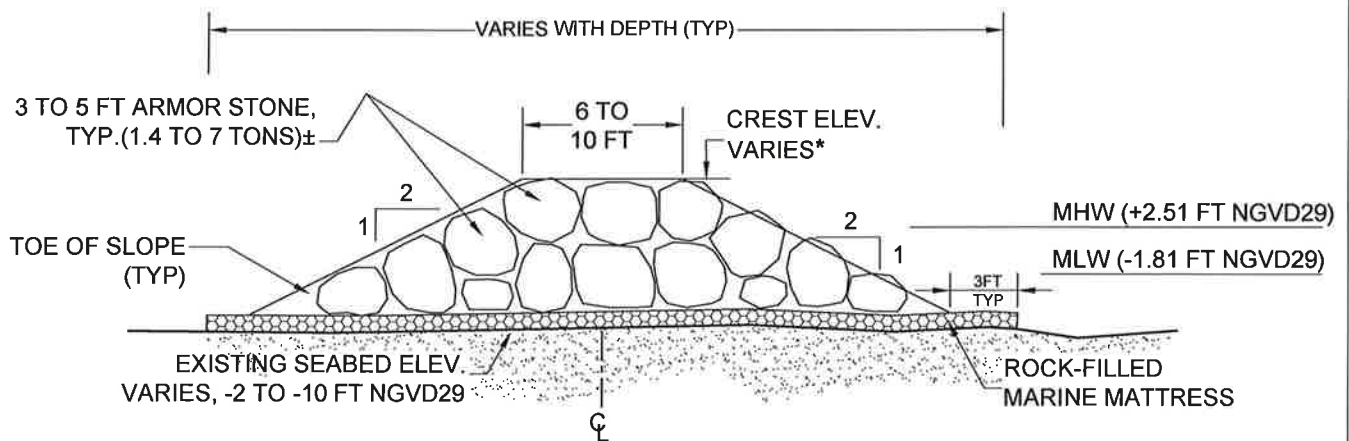
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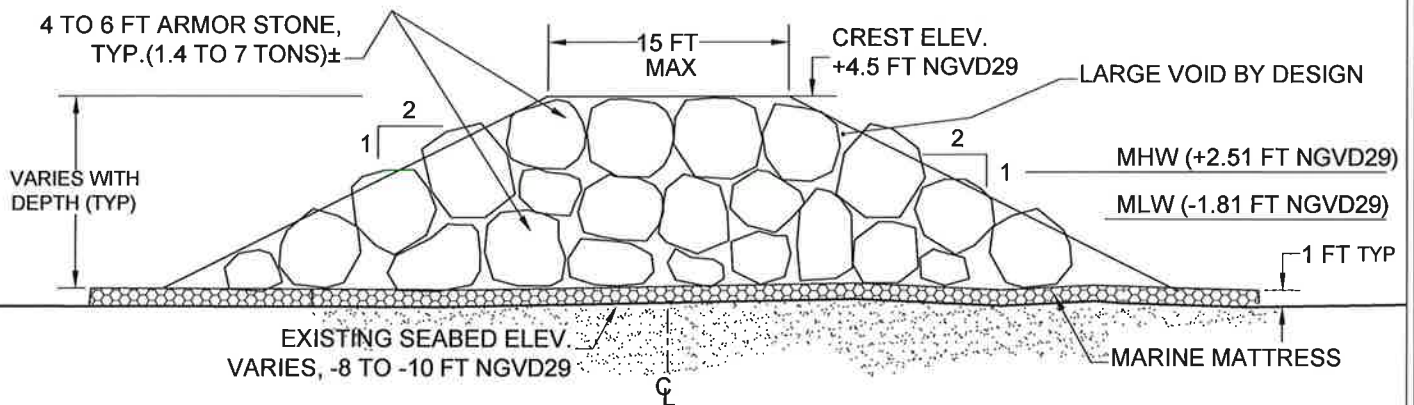
TIE BACK SECTION (A-A)



NTS

STEM SECTION (B-B)

* STEM ELEV VARIES FROM +4.5 FT TO +7.0 FT



NTS

HEAD SECTION (C-C)

CL - CENTERLINE (TYP)

DATUM: NGVD29

NOT FOR PURPOSES OF CONSTRUCTION - SUBJECT TO DESIGN REVISIONS BASED UPON SITE CONDITIONS

NOTE: 1) CREST ELEVATION VARIES ALONG STRUCTURE PROFILE



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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

TYPICAL CROSS SECTIONS



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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

TIEBACK

BEACH FILL NOT SHOWN

ELEV = +6'

SLOPE

EFFECTIVE CREST

ROCK GROIN

EXCAVATION NOT SHOWN

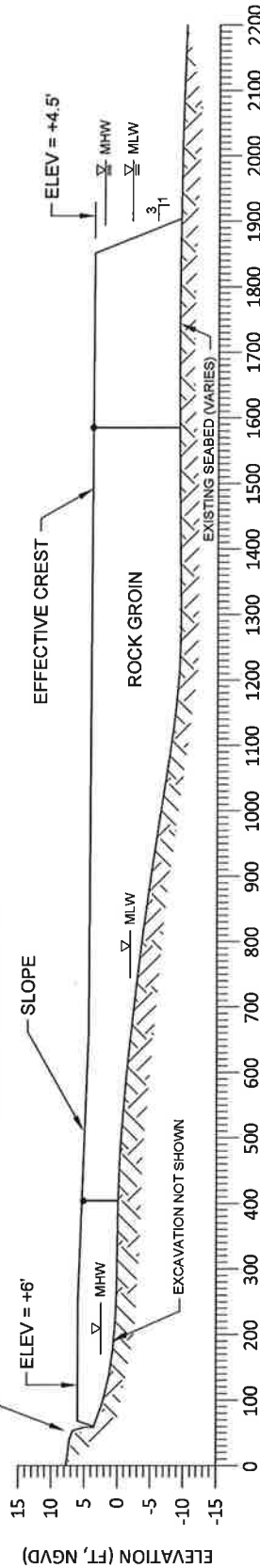
EXISTING SEABED (VARIES)

ELEV = +4.5'

MHW

MLW

3/1



DISTANCE (FT)
 ALONG GROIN CENTERLINE

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



DATUM - NGVD1929

NOT FOR PURPOSES OF CONSTRUCTION

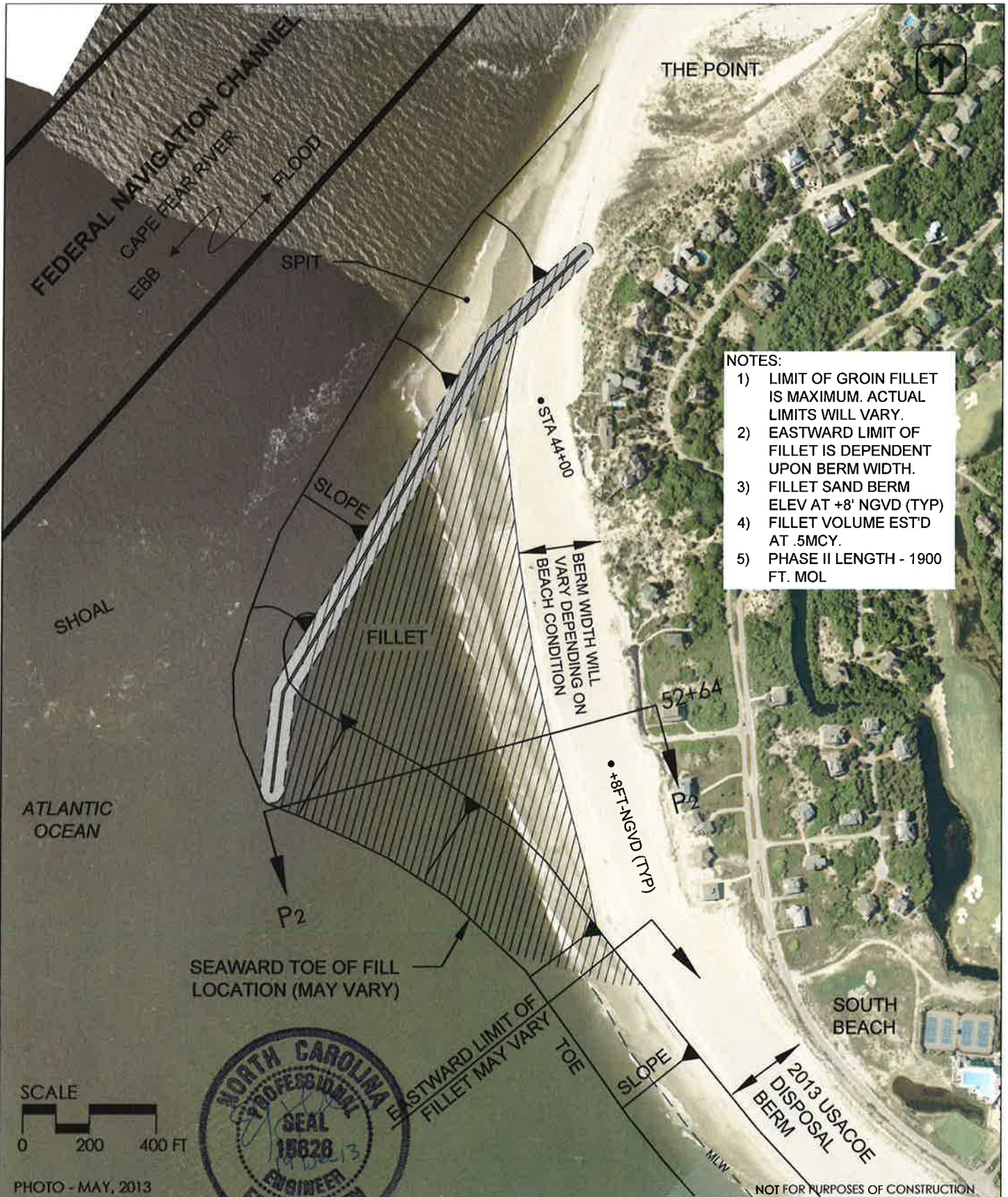


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VILLAGE OF BALD HEAD ISLAND TERMINAL GROIN PROJECT

GROIN PROFILE

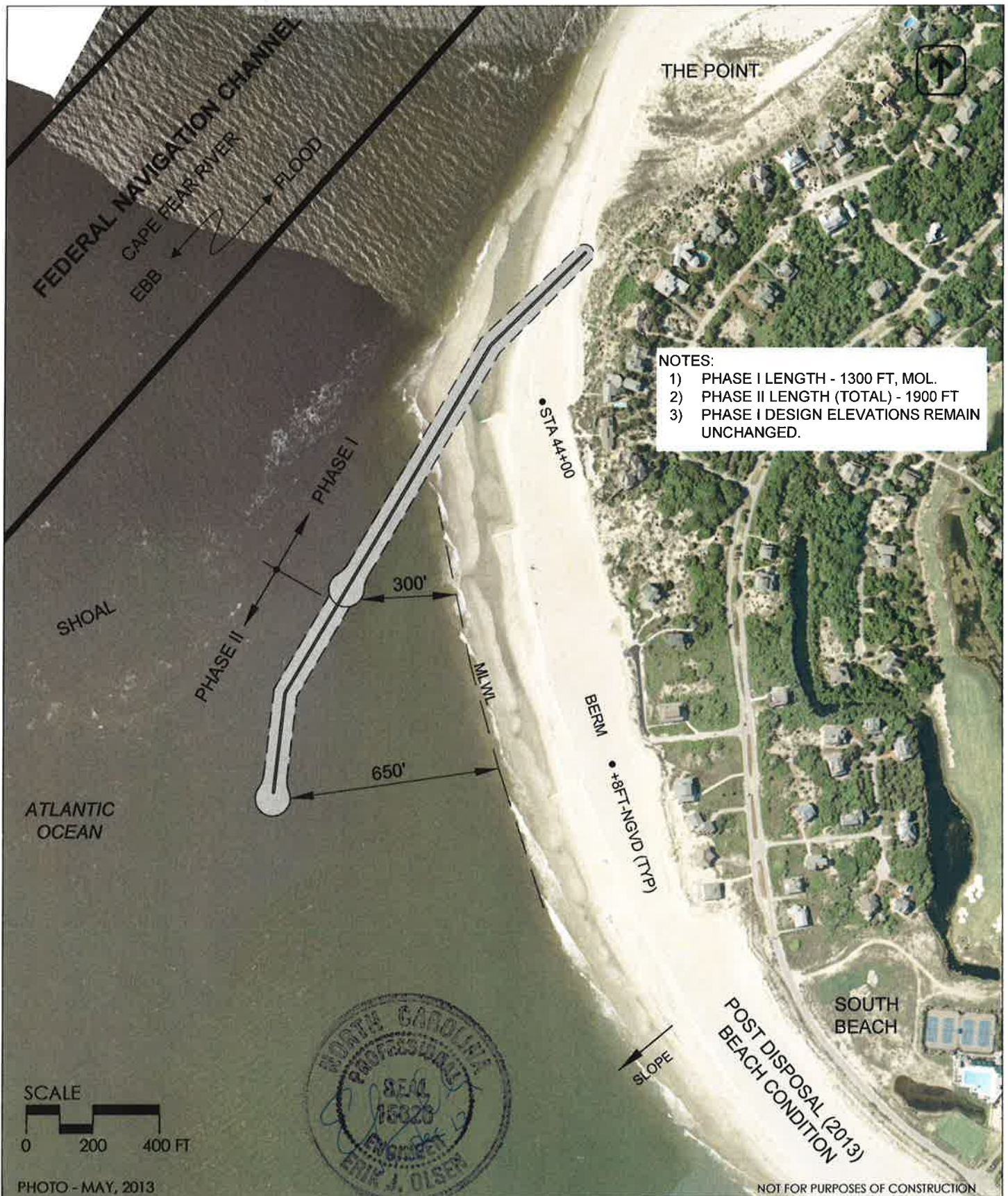
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**VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT
PHASE II GROIN FILLET
(MAXIMUM SEAWARD EXTENT)**

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VILLAGE OF BALD HEAD ISLAND TERMINAL GROIN PROJECT

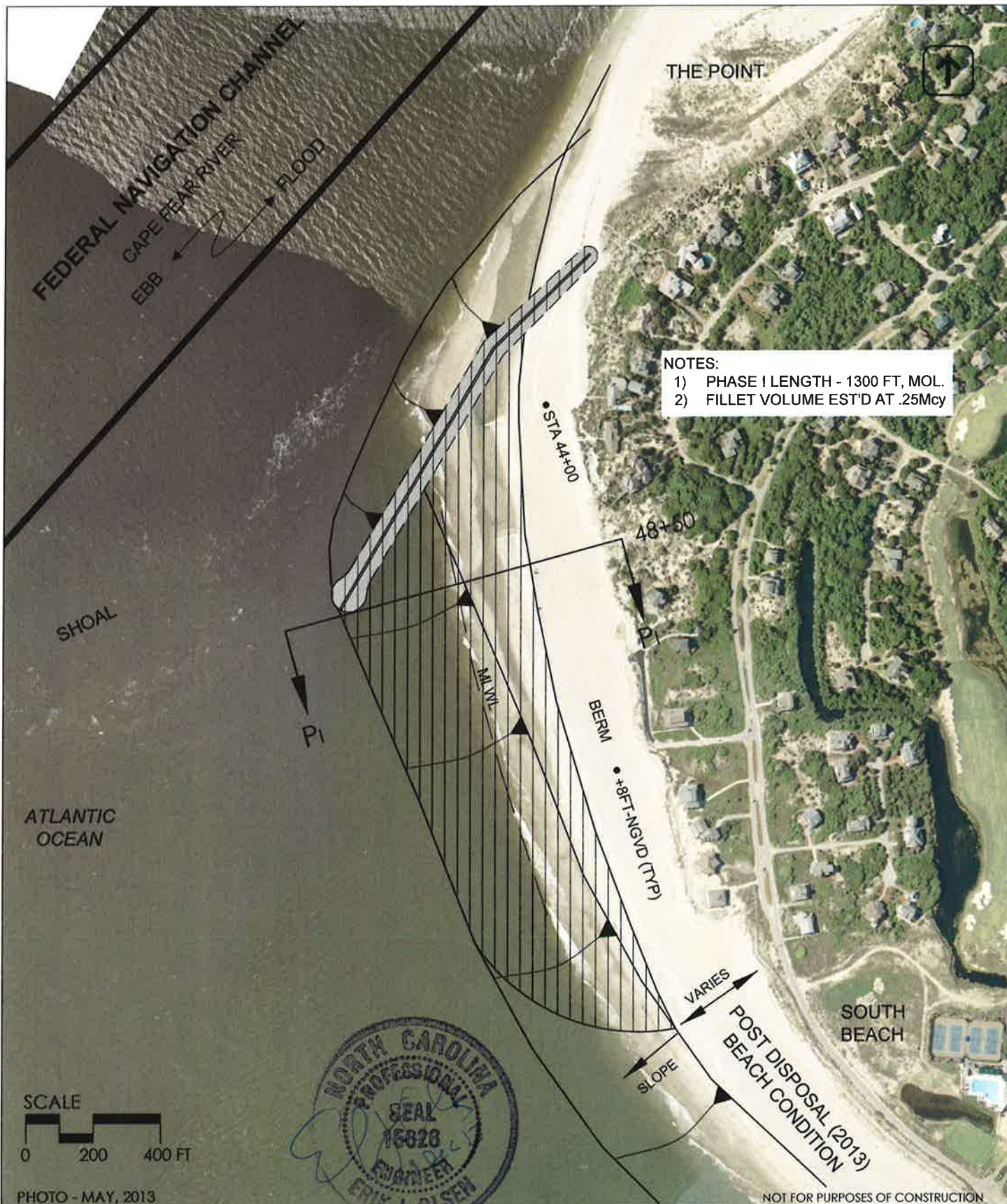
PHASED GROIN PLAN

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VILLAGE OF BALD HEAD ISLAND TERMINAL GROIN PROJECT

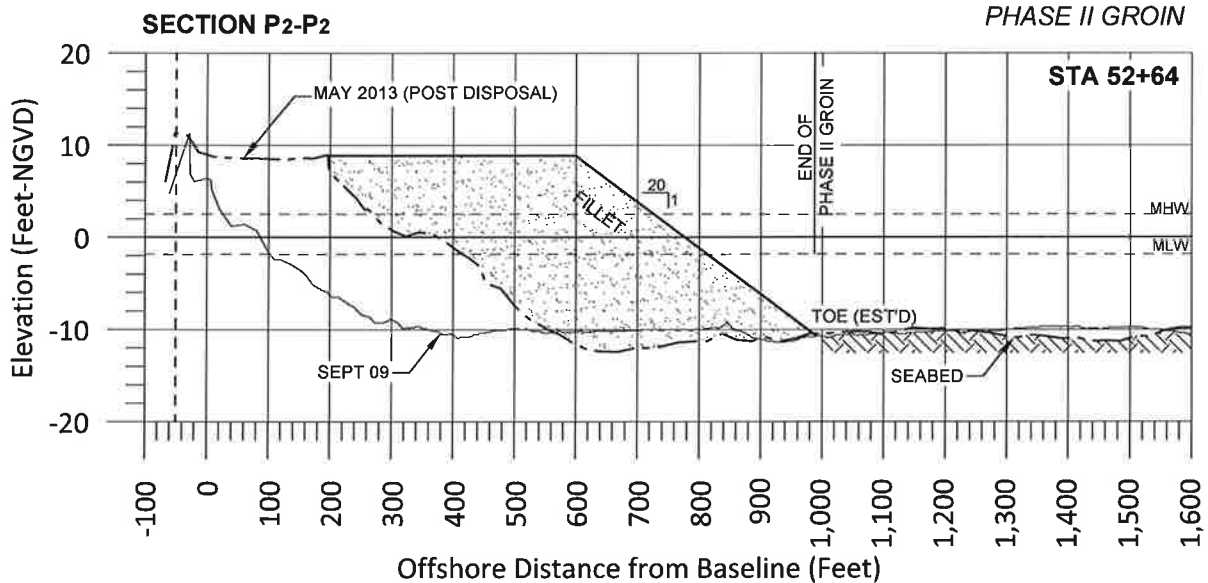
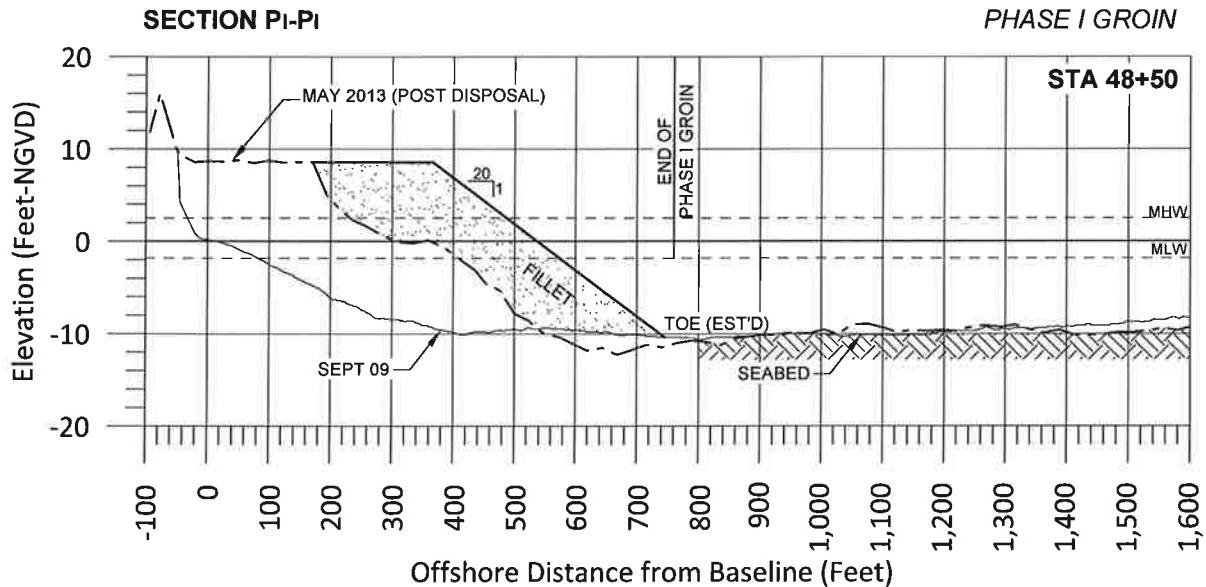
PHASE I GROIN FILLET (INITIAL SEAWARD EXTENT)

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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

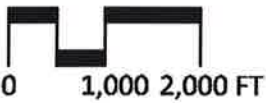
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SCALE



NOTES:

- 1) PROJECT BASELINE UTILIZED FOR BEACH MONITORING AND FEDERAL BEACH DISPOSAL PROJECT CONSTRUCTION BY WILMINGTON DISTRICT, USACE
- 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

PROJECT BASELINE
(STA 00+00)

WEST BEACH

THE POINT

CAPE
FEAR
RIVER

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



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
------	----------	----------

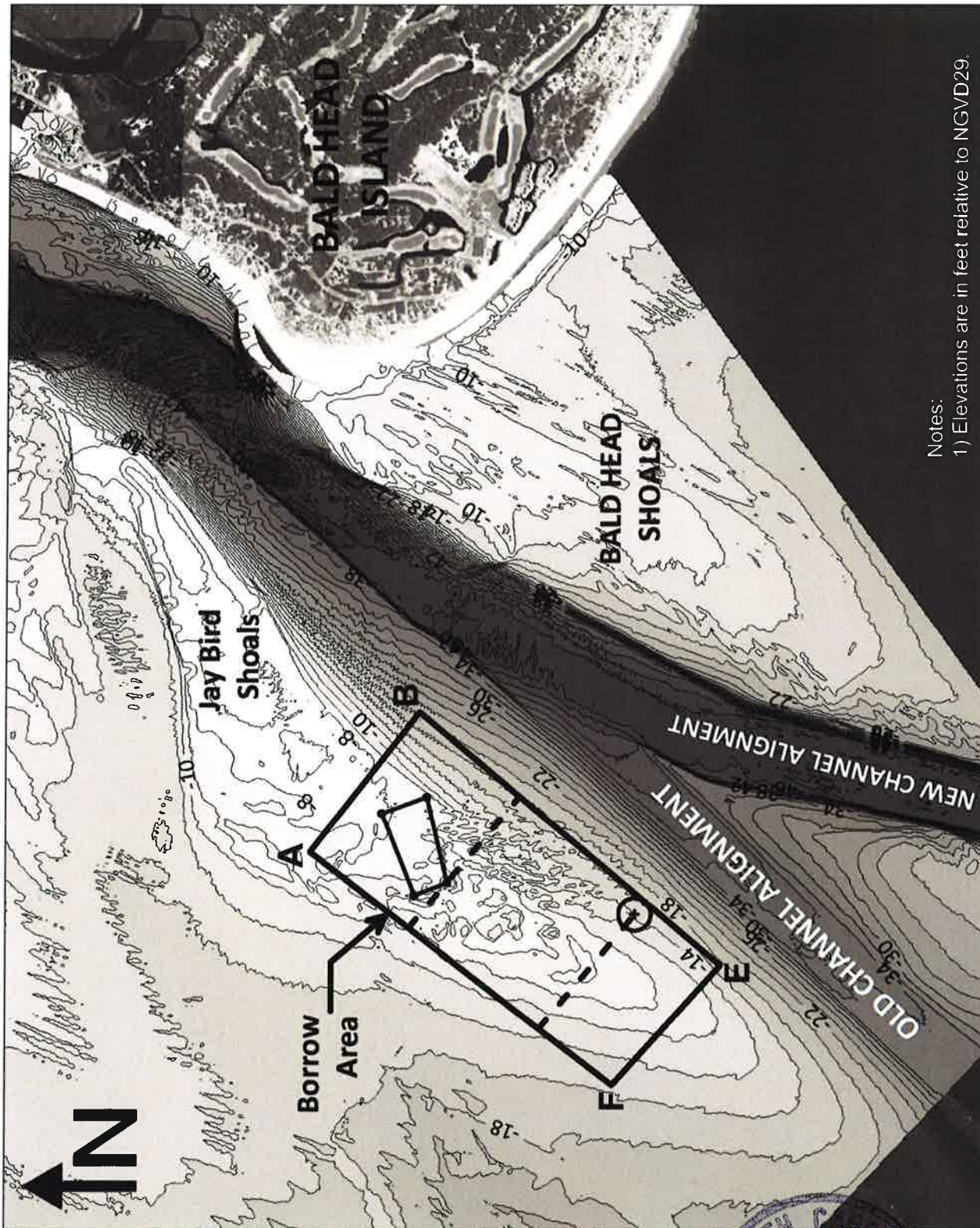
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Notes:
 1) Elevations are in feet relative to NGVD29.

VBHI RESTORATION PROJECT
 2009 BORROW SITE PERMITS:
 • CAMA-67-09
 • COE-2007-02699

2009 PROJECT PERMITTED BORROW AREA - A,B,E,F
 TERMINAL GROIN BORROW SITE

NOT FOR PURPOSES OF CONSTRUCTION



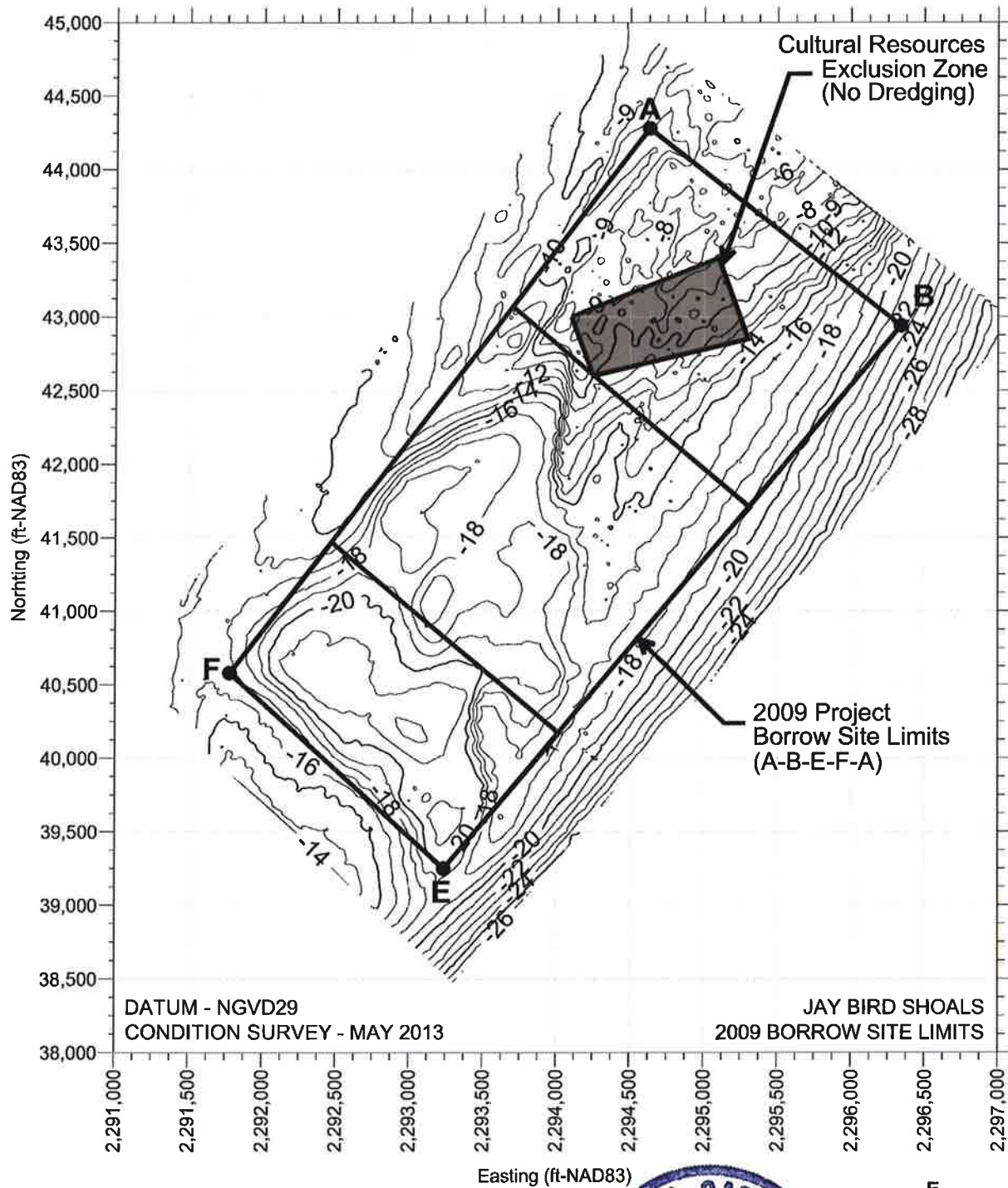
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

JAY BIRD SHOALS BORROW AREA



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VBHI RESTORATION PROJECT
2009 BORROW SITE PERMITS:

- CAMA-67-09
- COE-2007-02699

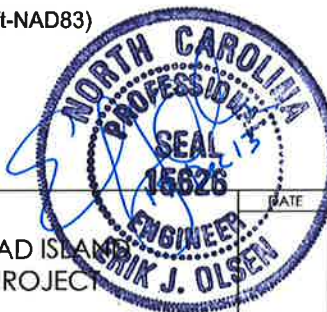
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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

2013 BORROW AREA CONDITION SURVEY



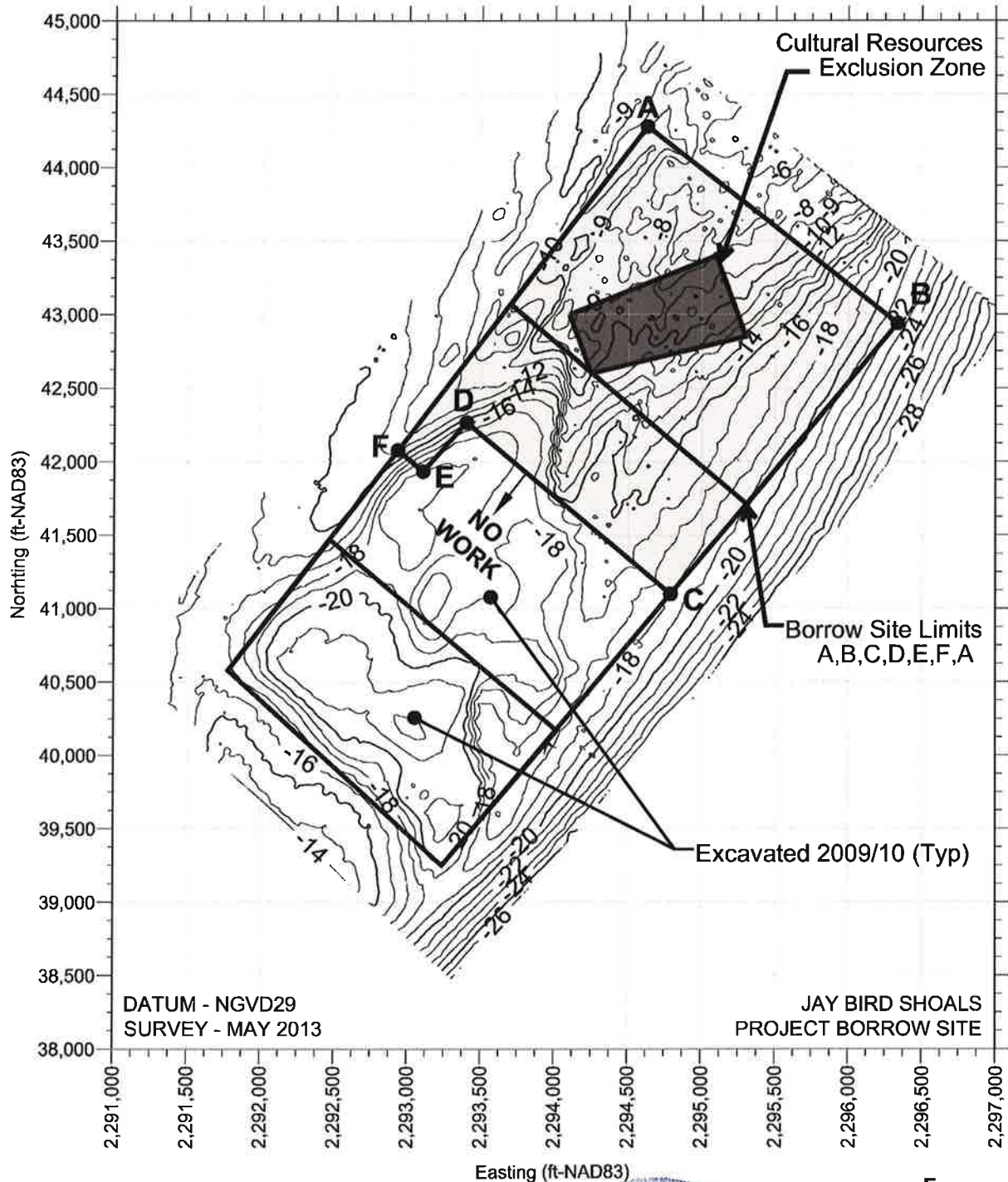
	E	N
A	2,294,630	44,280
B	2,296,340	42,940
E	2,293,240	39,250
F	2,291,780	40,580

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**VBHI RESTORATION PROJECT
2009 BORROW SITE PERMITS:**

- CAMA-67-09
- COE-2007-02699



	E	N
A	2,294,630	44,280
B	2,296,340	42,940
C	2,294,790	41,100
D	2,293,400	42,260
E	2,293,100	41,930
F	2,292,930	42,080

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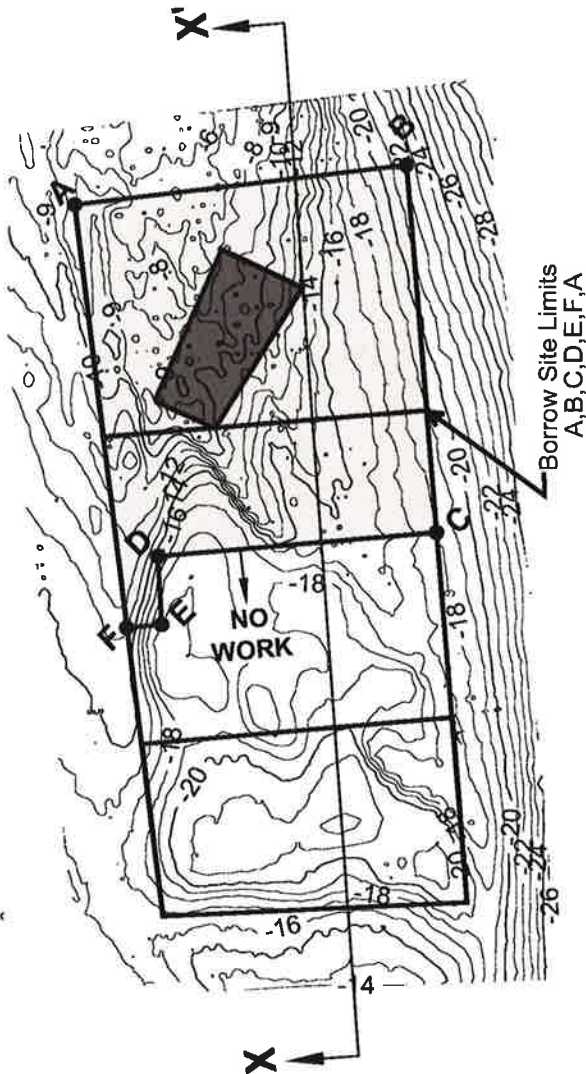
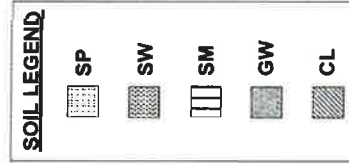
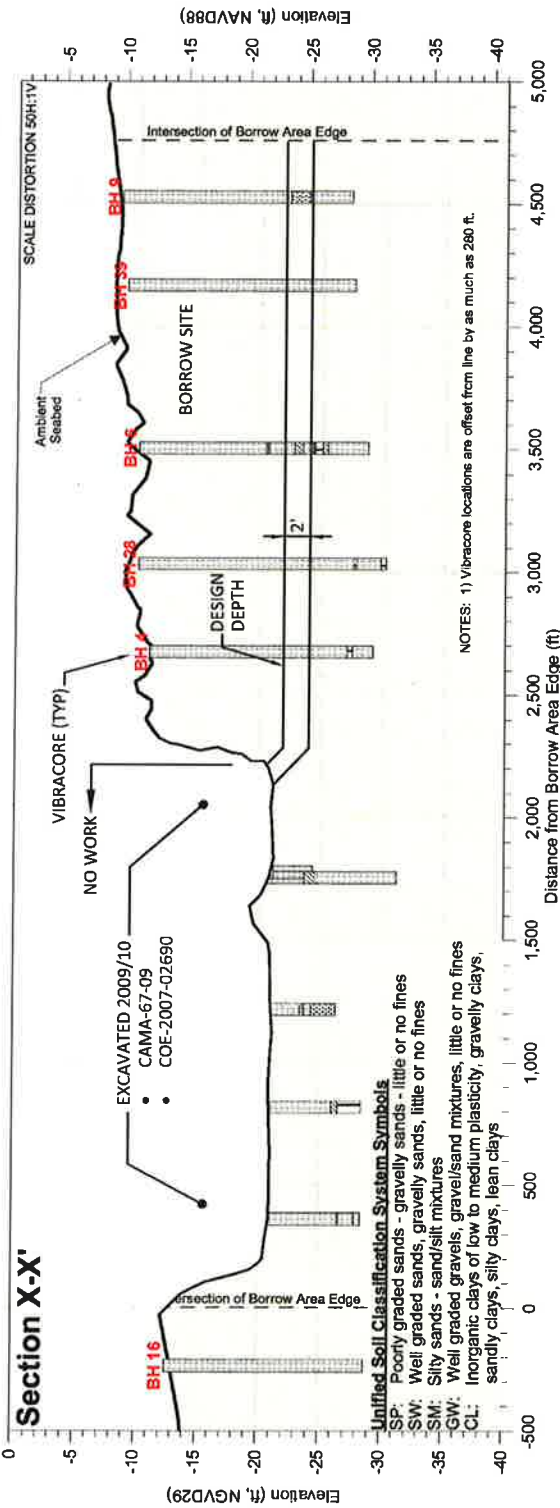
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**VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT**

PROJECT BORROW SITE

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JAY BIRD SHOALS



SCALES: AS SHOWN

SECTION X-X' LOCATION

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

JAY BIRD SHOALS BORROW SITE

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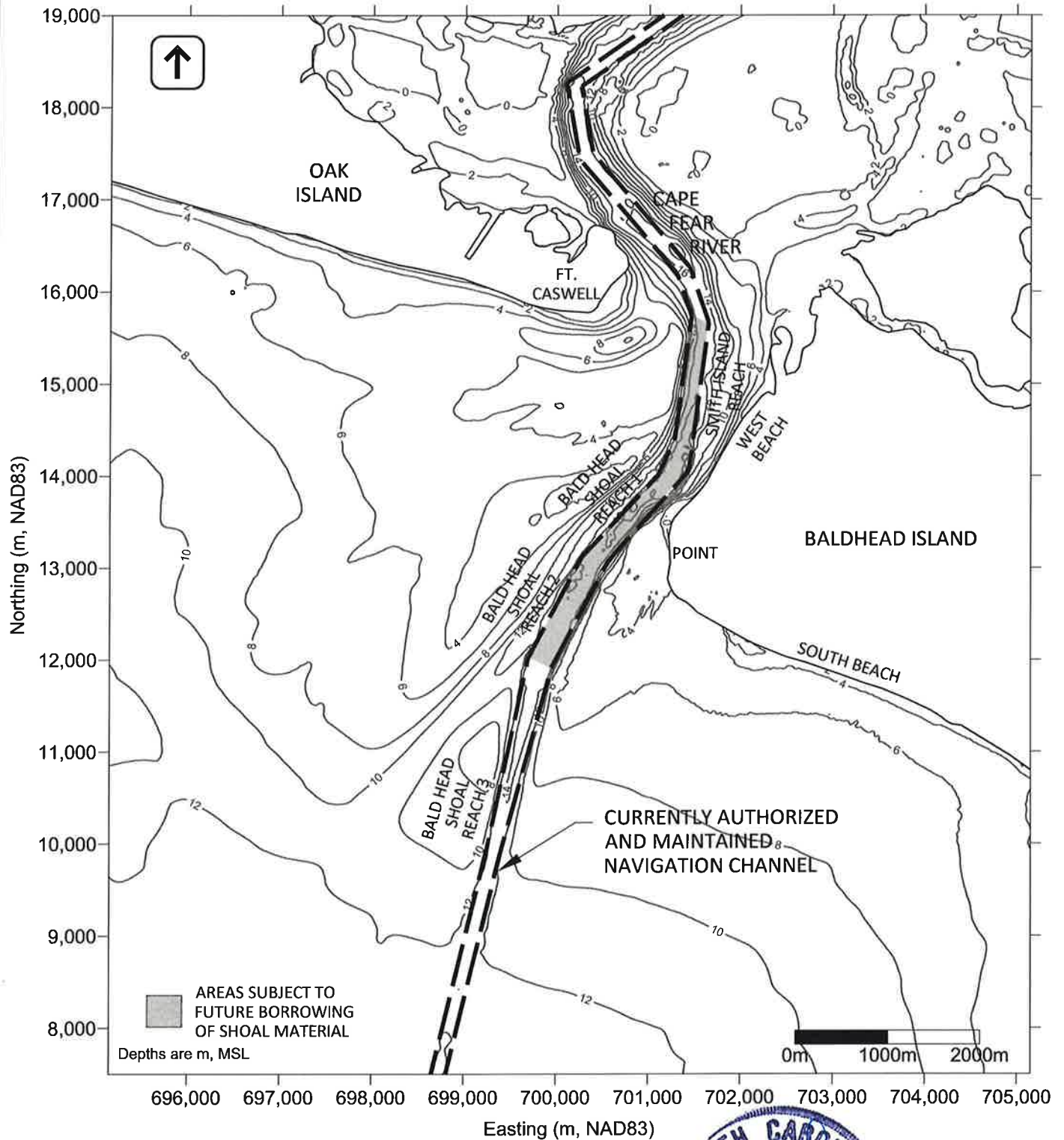
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VILLAGE OF BALD HEAD ISLAND
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BORROW SITE TYPICAL SECTION



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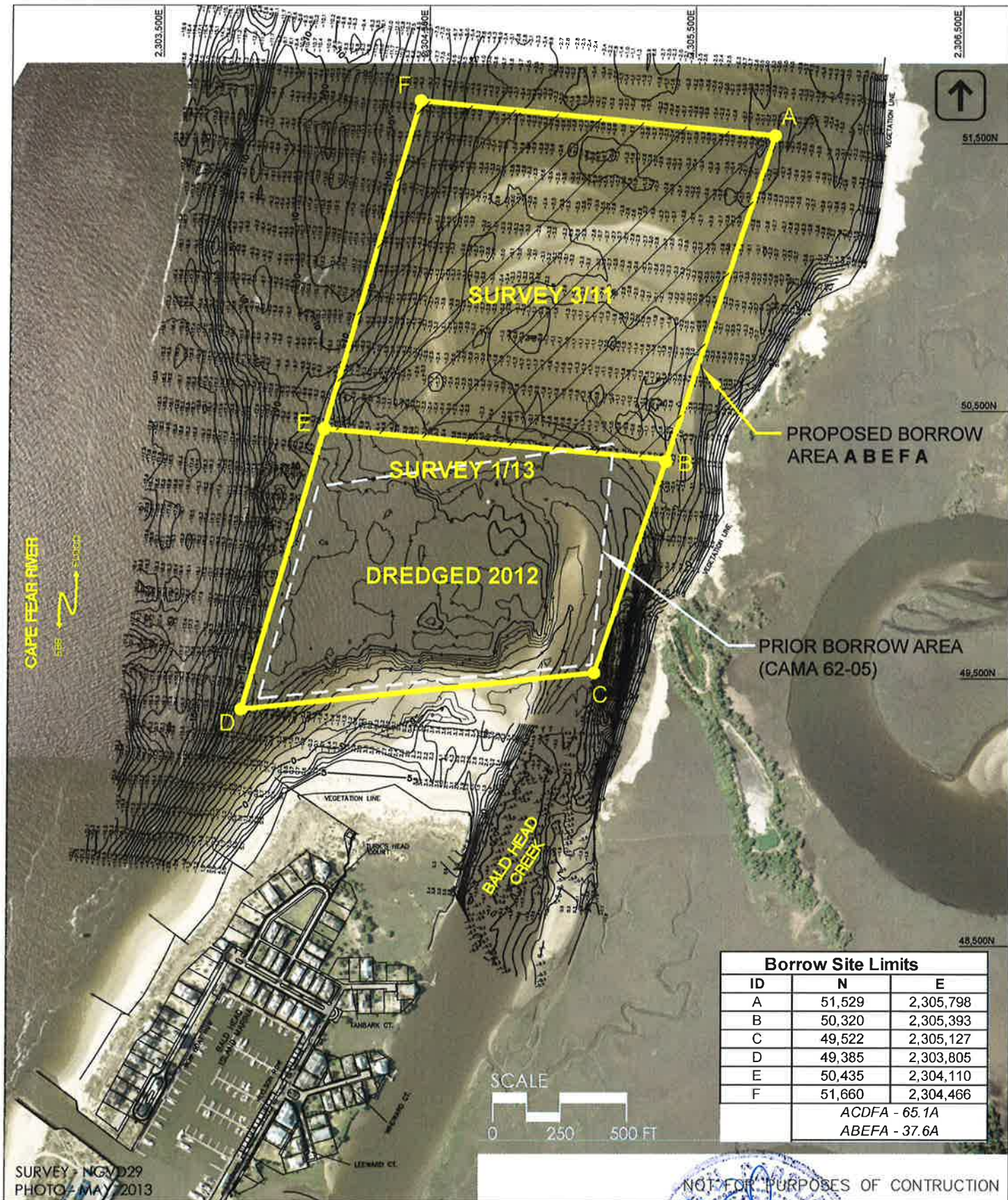
VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
NAVIGATION PROJECT BORROW AREAS

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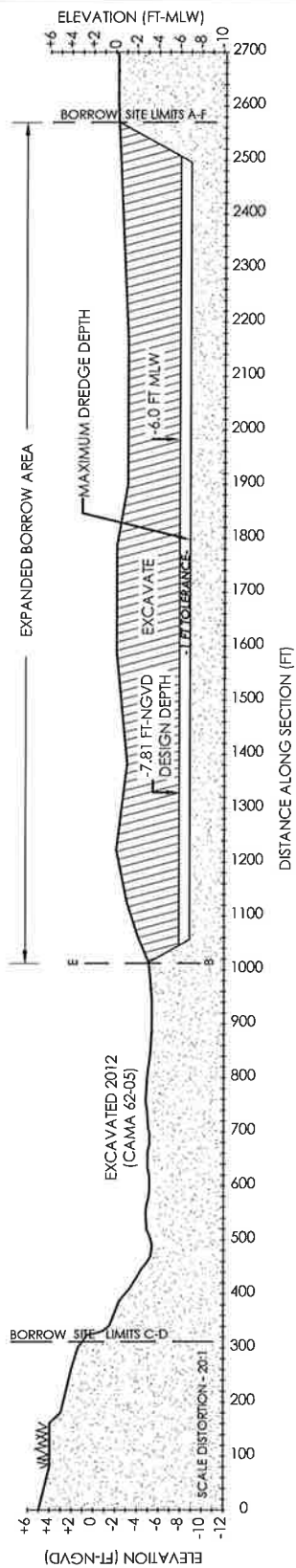
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**VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT
BALD HEAD CREEK
BORROW AREA**

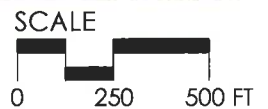
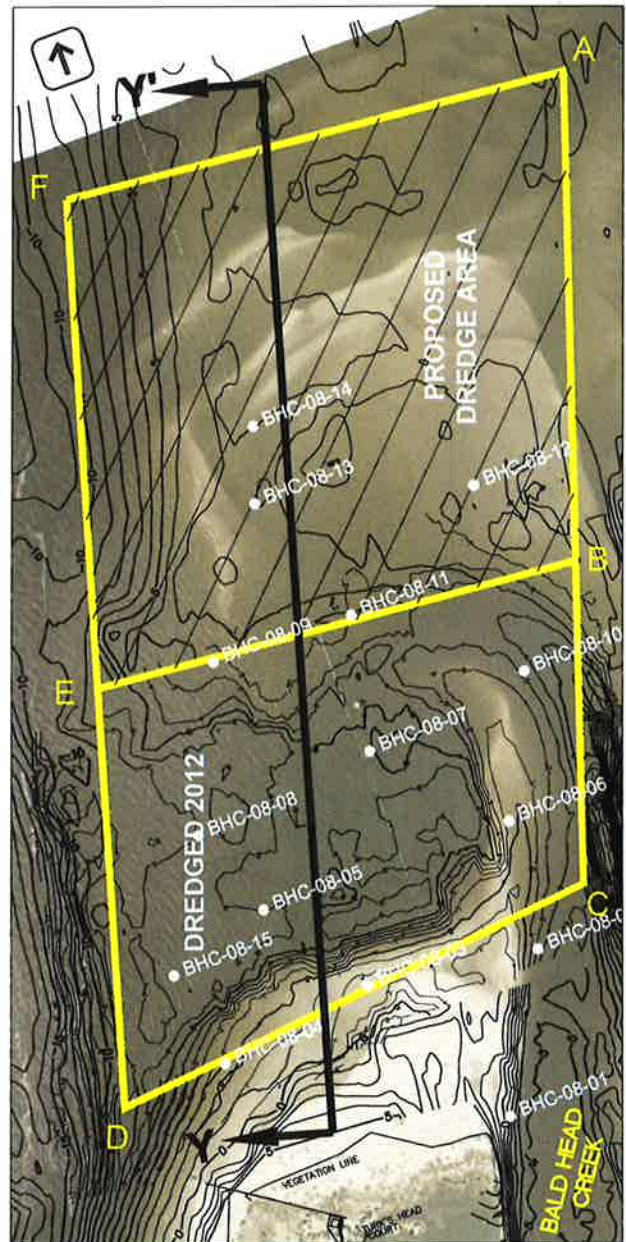


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SURVEY - NGVD29
PHOTO - MAY, 2013



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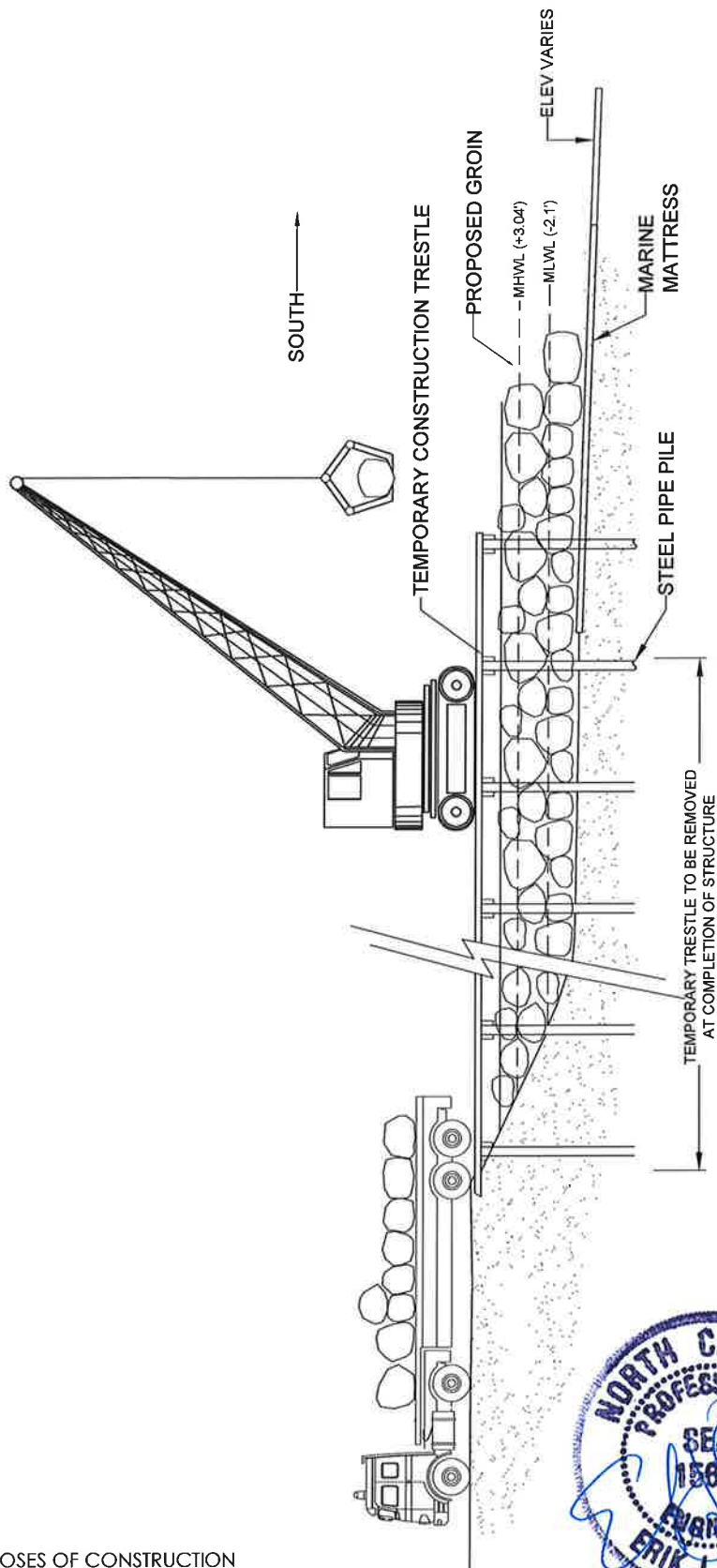
VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT
BALD HEAD CREEK BORROW SITE
TYPICAL SECTION

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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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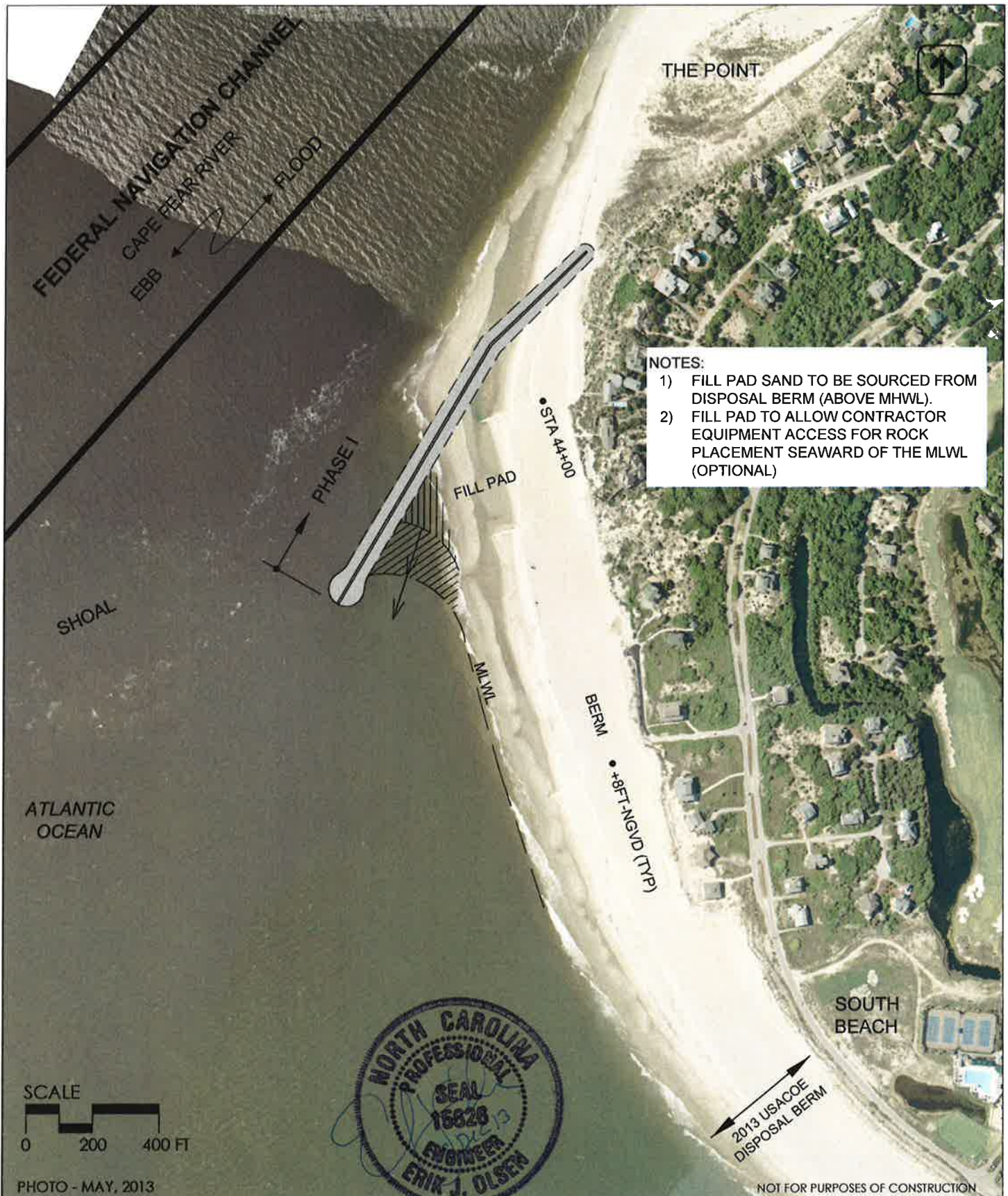
TEMPORARY TRESTLE

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VILLAGE OF BALD HEAD ISLAND TERMINAL GROIN PROJECT

PHASE I GROIN FILL PAD (OPTION)

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