

APPENDIX H

PROJECT DESIGN DRAWINGS – PROPOSED ACTION

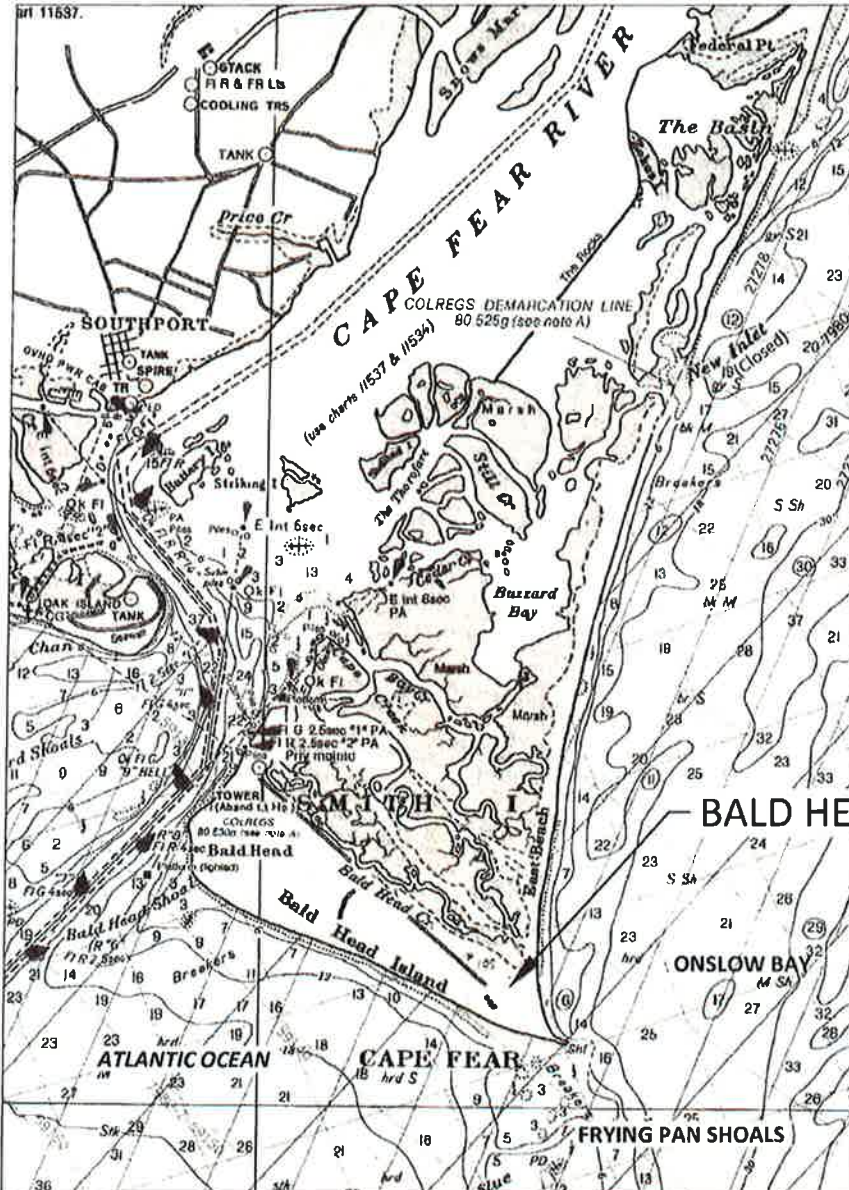
(Prepared by Olsen Associates, Inc.)



APPLICANT:
VILLAGE OF BALD HEAD ISLAND

ENGINEER:
OLSEN ASSOCIATES, INC.

AGENT:
ERIK J. OLSEN, P.E.



BALD HEAD ISLAND

DATUM: MLLW

NTS



BRUNSWICK COUNTY, N.C.

SITE

NOT FOR PURPOSES OF CONSTRUCTION



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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

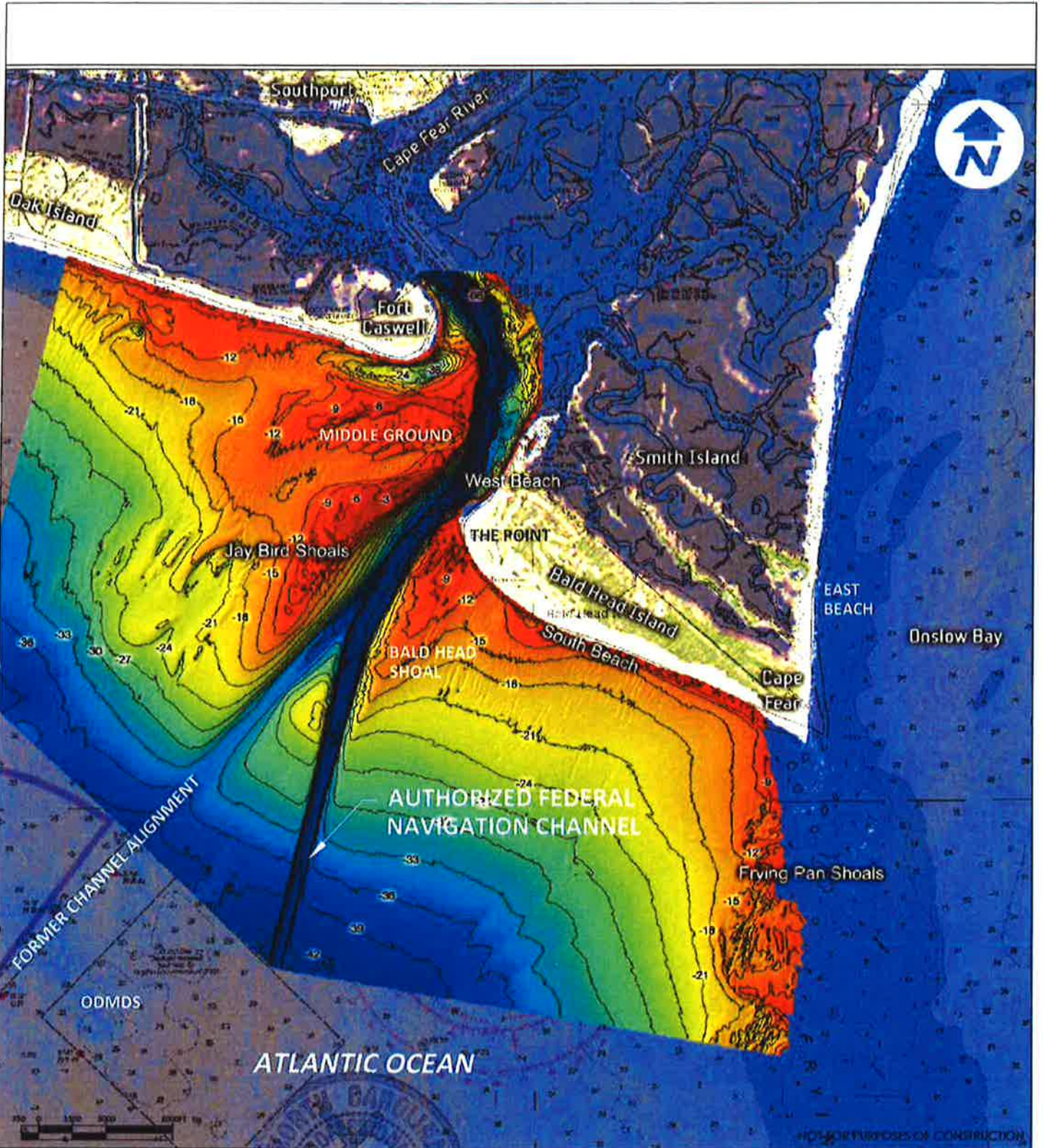
PROJECT LOCATION

DATE APPROVED REVISION

09/30/2013

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1 of 21



2006 SURVEY-GEODYNAMICS, INC

2006 CONTOUR DATUM: NGVD 29
NAUTICAL CHART DATUM: MLLW

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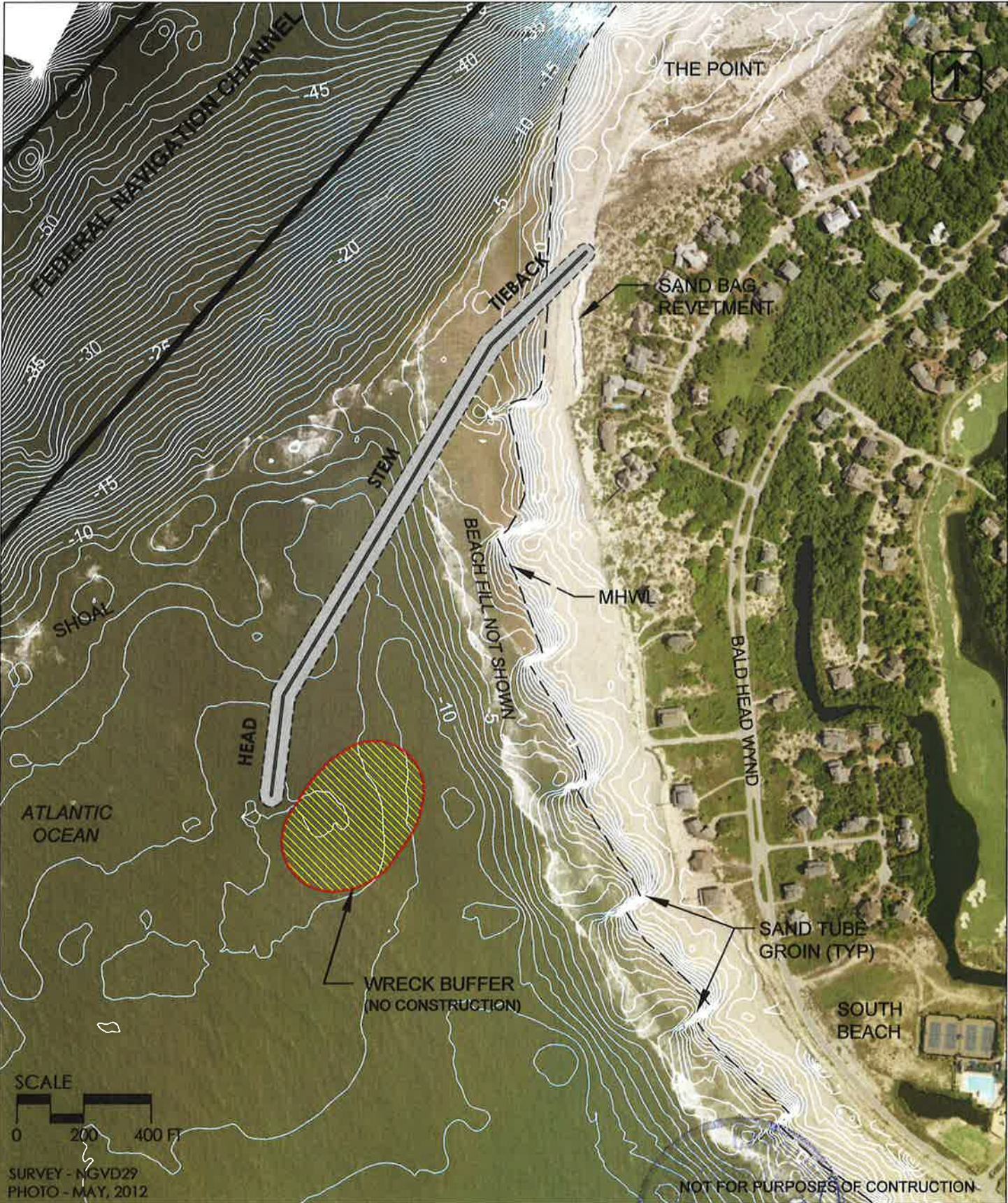
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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

SITE CONDITIONS

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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

GROIN LOCATION AND CONFIGURATION

DATE	APPROVED	REVISION
05-01-2014	EJO	1

09/30/2013

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

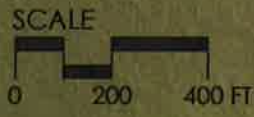


PHOTO - MAY, 2012

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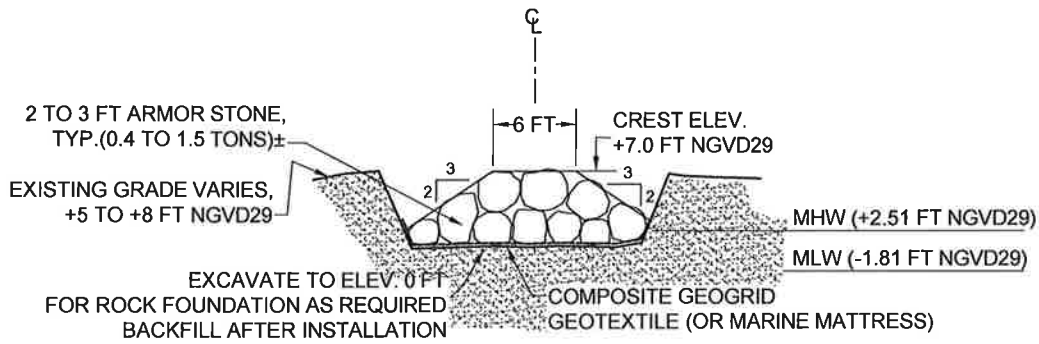
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
GROIN DESIGN SECTION LOCATIONS

DATE	APPROVED	REVISION
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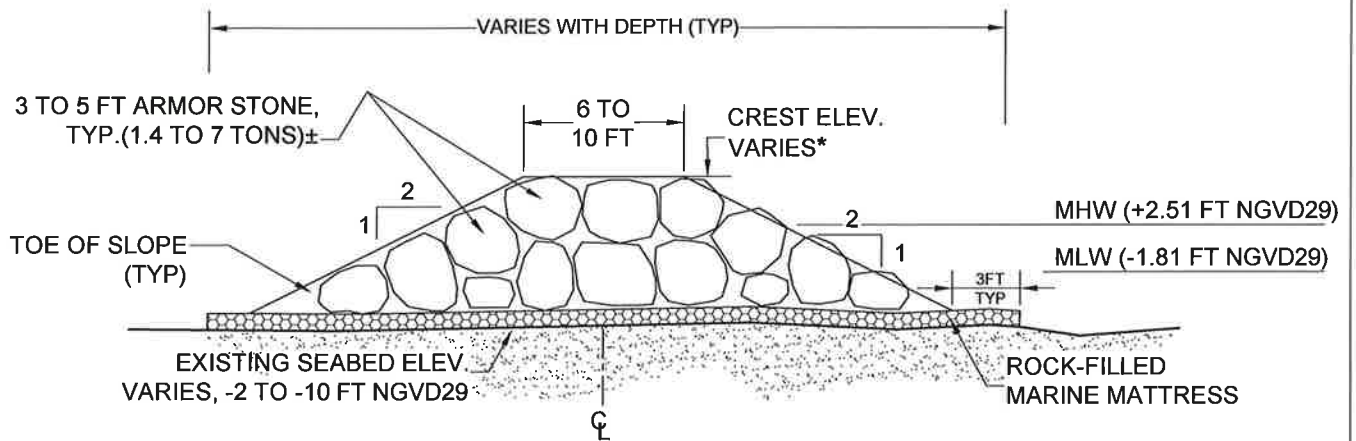
Professional Engineer Seal for Erik J. Olsen, No. 18026, State of Florida.

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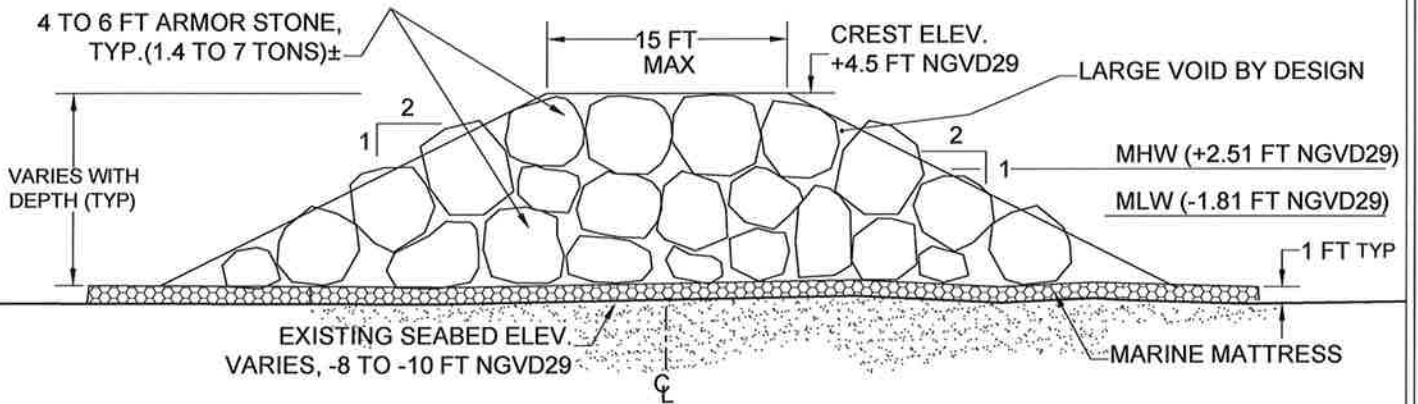
TIE BACK SECTION (A-A)



NTS

STEM SECTION (B-B)

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



NTS

HEAD SECTION (C-C)

CL - CENTERLINE (TYP)

DATUM: NGVD'29

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

NOTE: CREST ELEVATION VARIES ALONG STRUCTURE PROFILE



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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

TYPICAL CROSS SECTIONS



DATE	APPROVED	REVISION
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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

STEM

HEAD

BEACH FILL NOT SHOWN

SLOPE

ELEV = +4.5'

MHW

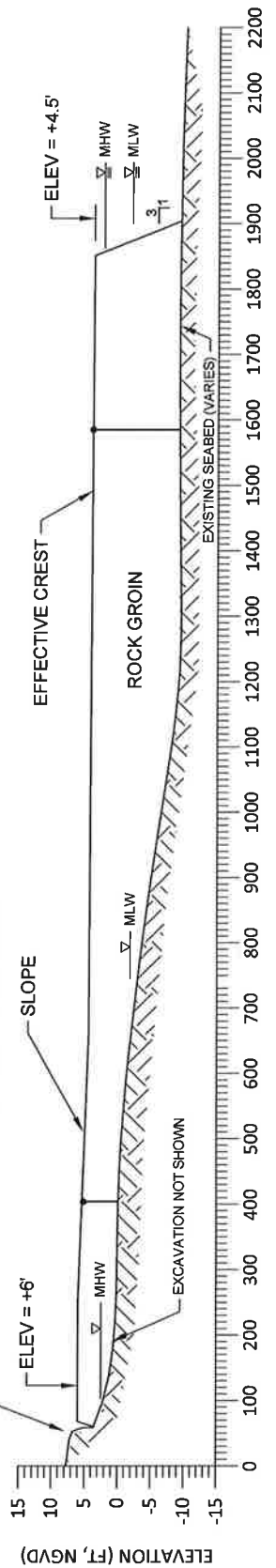
MLW

EFFECTIVE CREST

ROCK GROIN

EXCAVATION NOT SHOWN

EXISTING SEABED (VARIES)

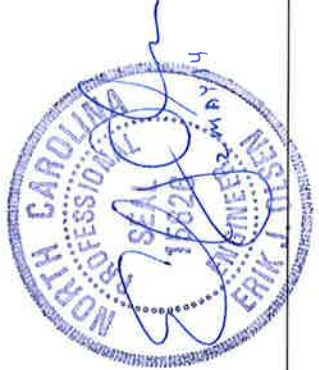


DISTANCE (FT)
ALONG GROIN CENTERLINE

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

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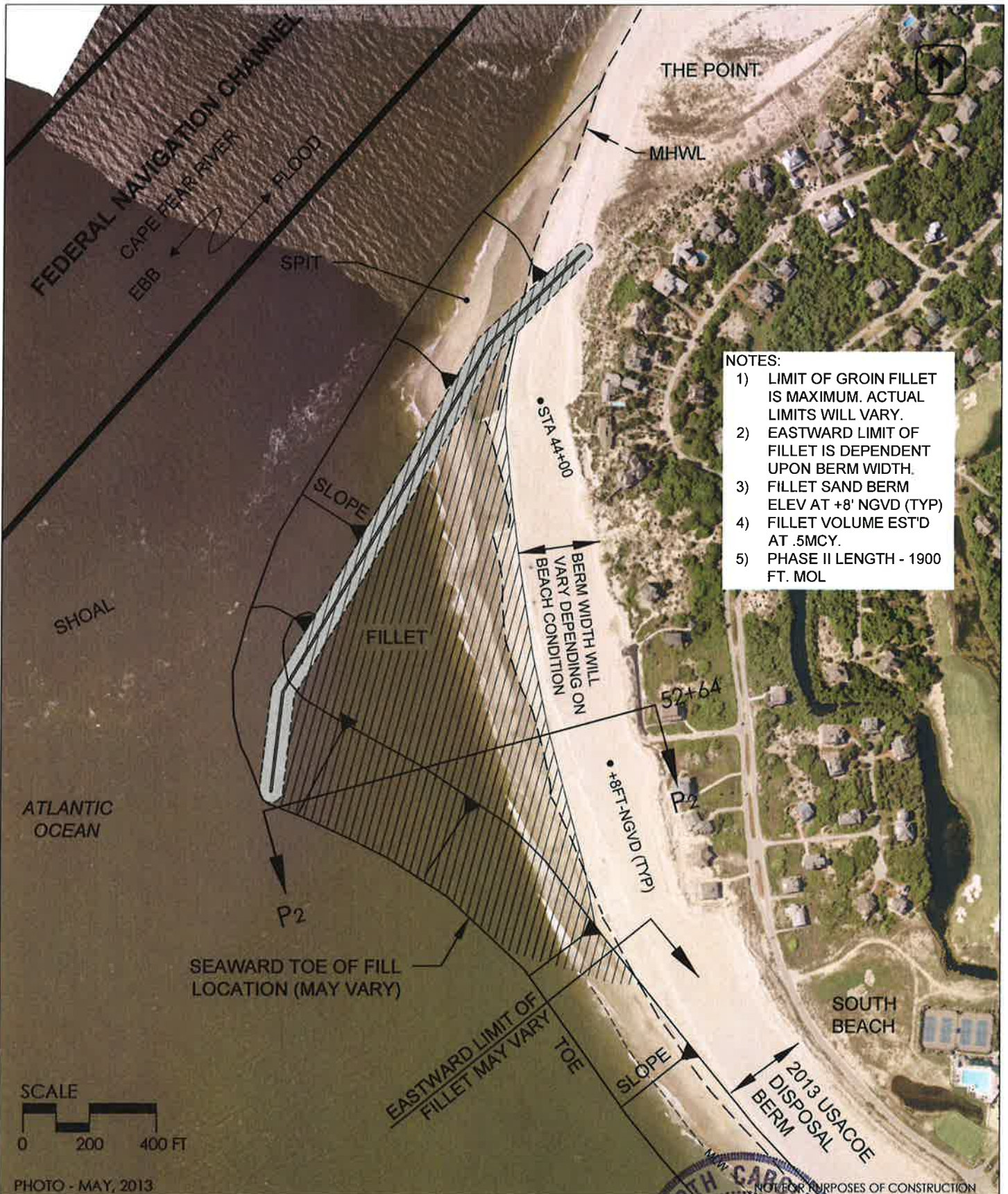


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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

GROIN PROFILE

DATE	APPROVED	REVISION	
05-01-2014	EJO	1	09/30/2013
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- NOTES:**
- 1) LIMIT OF GROIN FILLET IS MAXIMUM. ACTUAL LIMITS WILL VARY.
 - 2) EASTWARD LIMIT OF FILLET IS DEPENDENT UPON BERM WIDTH.
 - 3) FILLET SAND BERM ELEV AT +8' NGVD (TYP)
 - 4) FILLET VOLUME EST'D AT .5MCY.
 - 5) PHASE II LENGTH - 1900 FT. MOL



PHOTO - MAY, 2013

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



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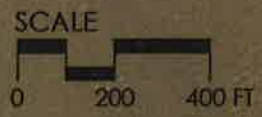
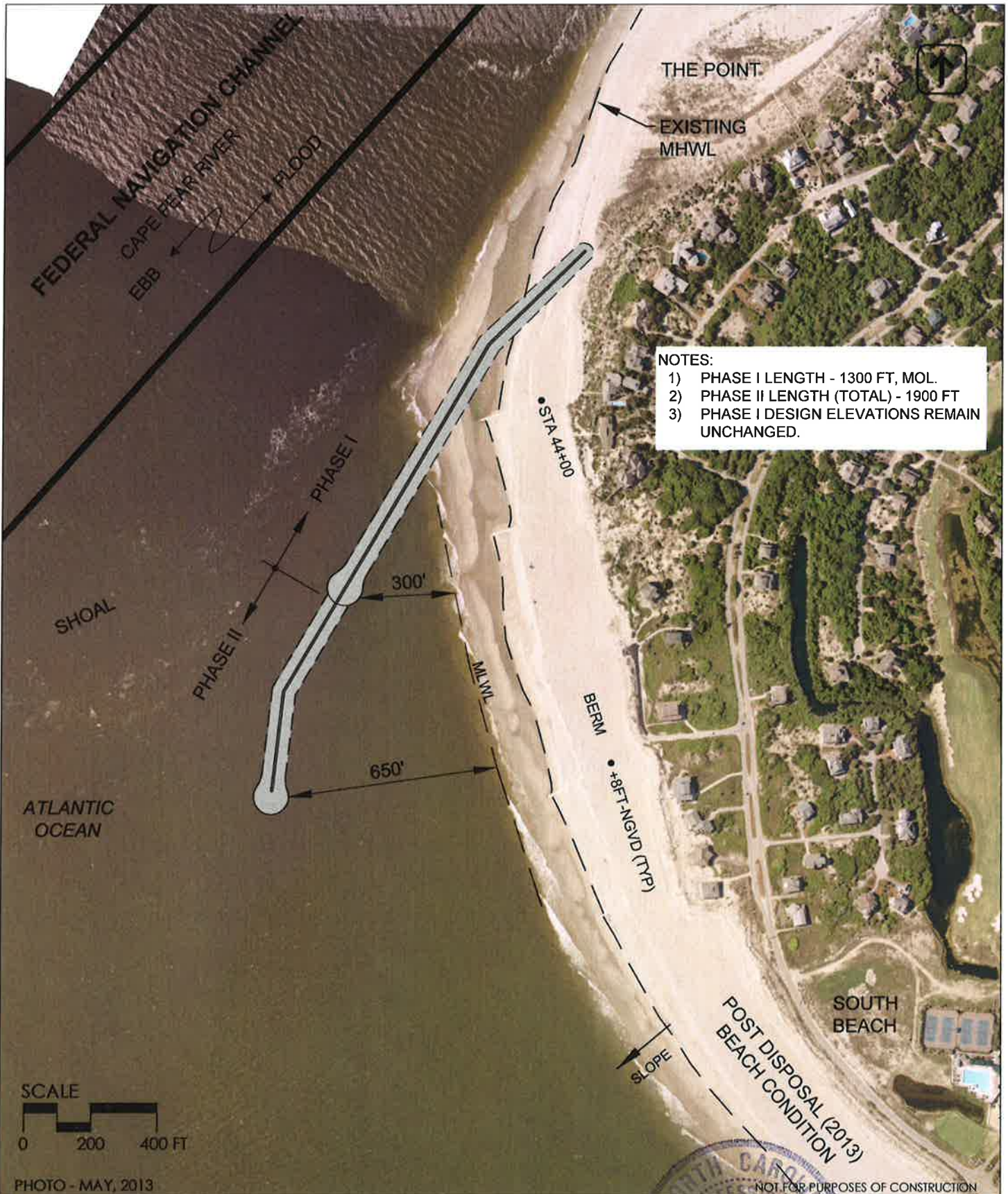


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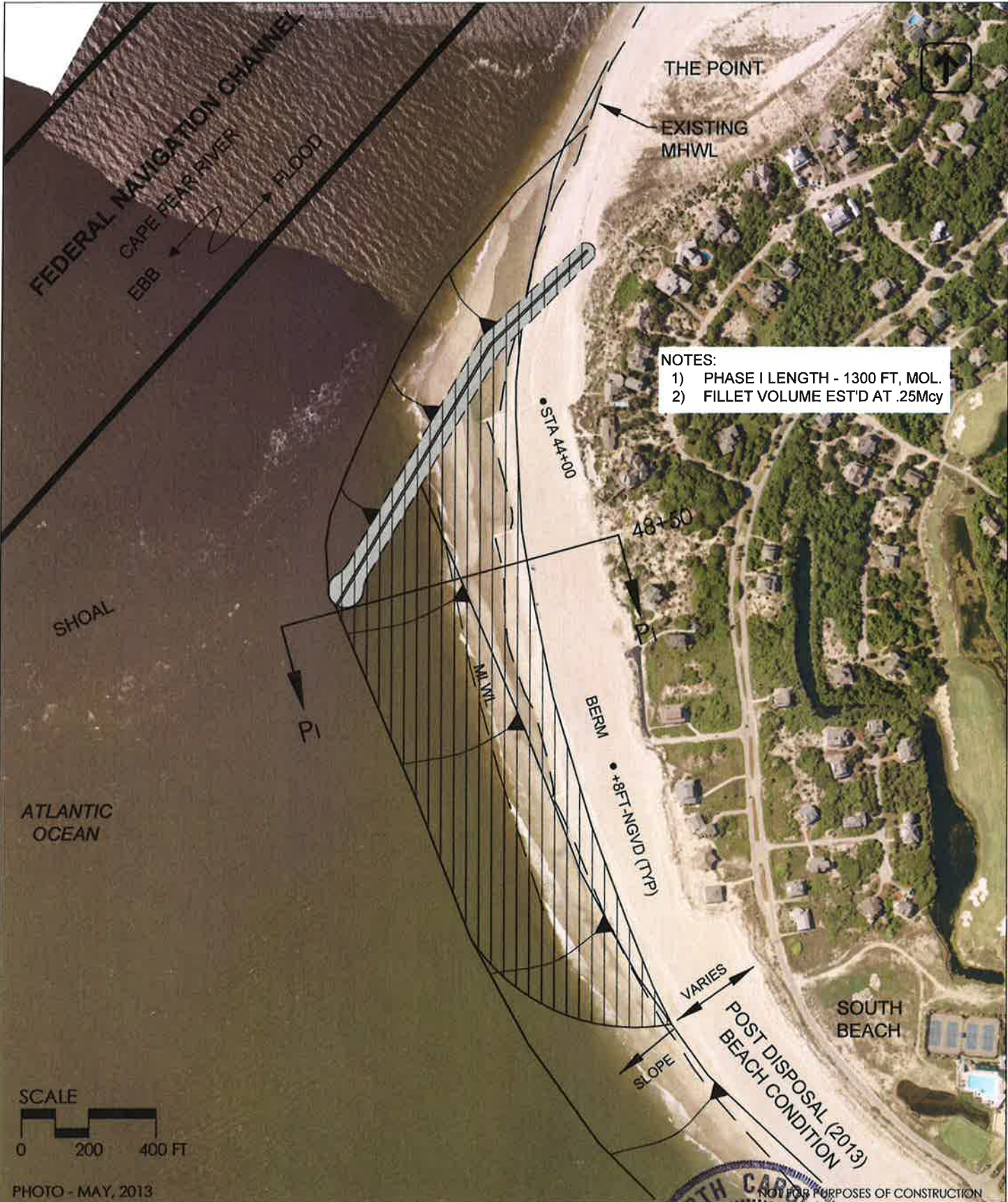
VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

PHASED GROIN PLAN



DATE	APPROVED	REVISION
05-01-2014	EJO	

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NOTES:
 1) PHASE I LENGTH - 1300 FT, MOL.
 2) FILLET VOLUME EST'D AT .25Mcy

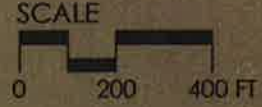


PHOTO - MAY, 2013

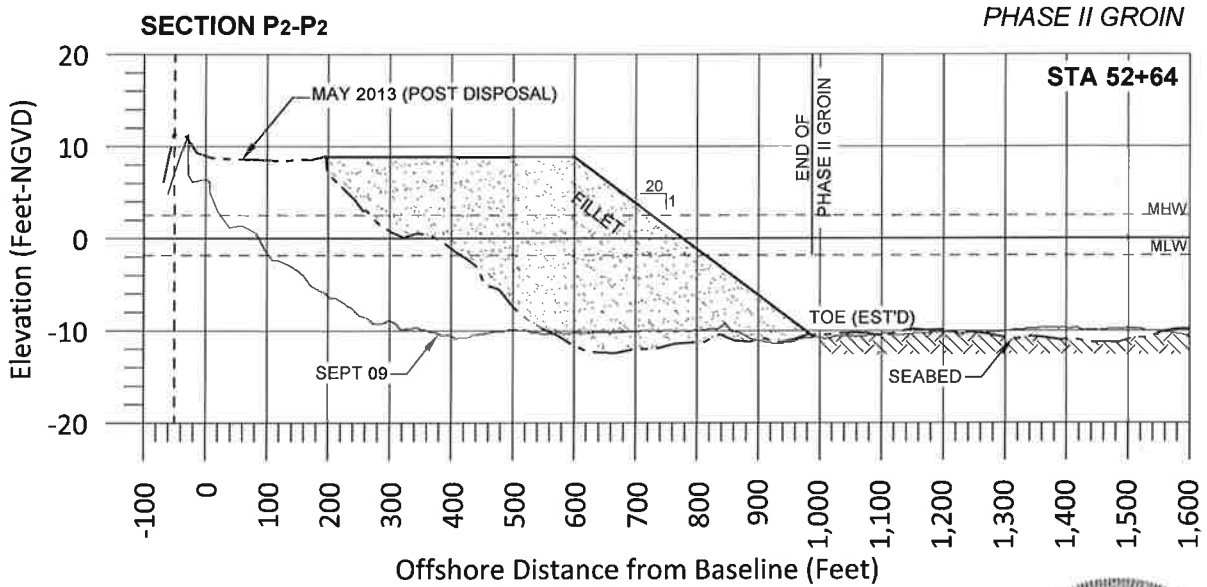
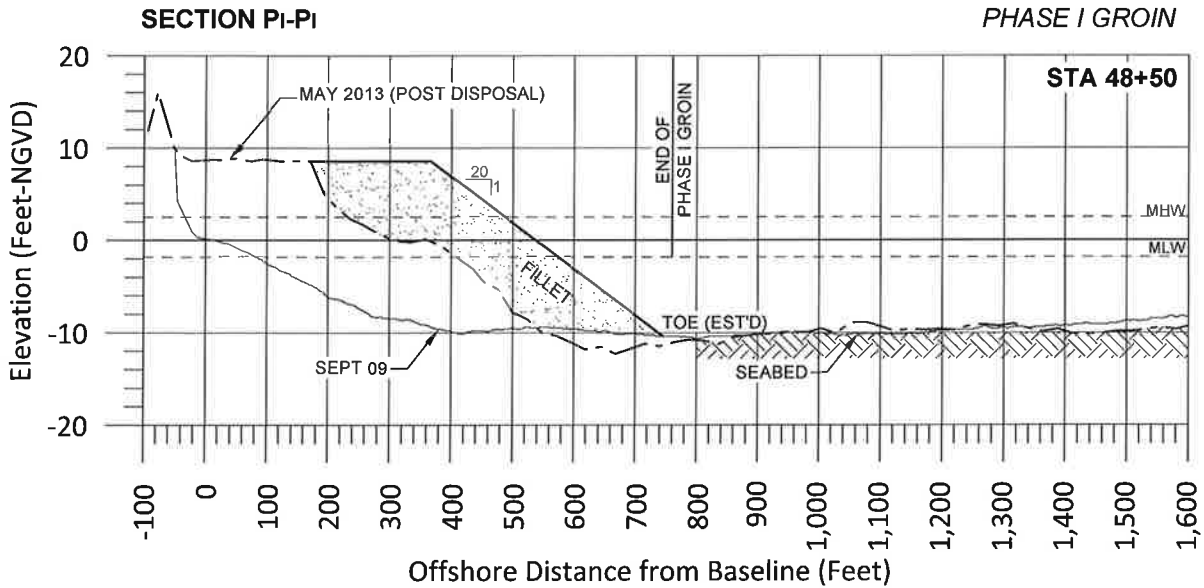
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
**PHASE I GROIN FILLET
 (INITIAL SEAWARD EXTENT)**



09/30/2013
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NOTES:

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



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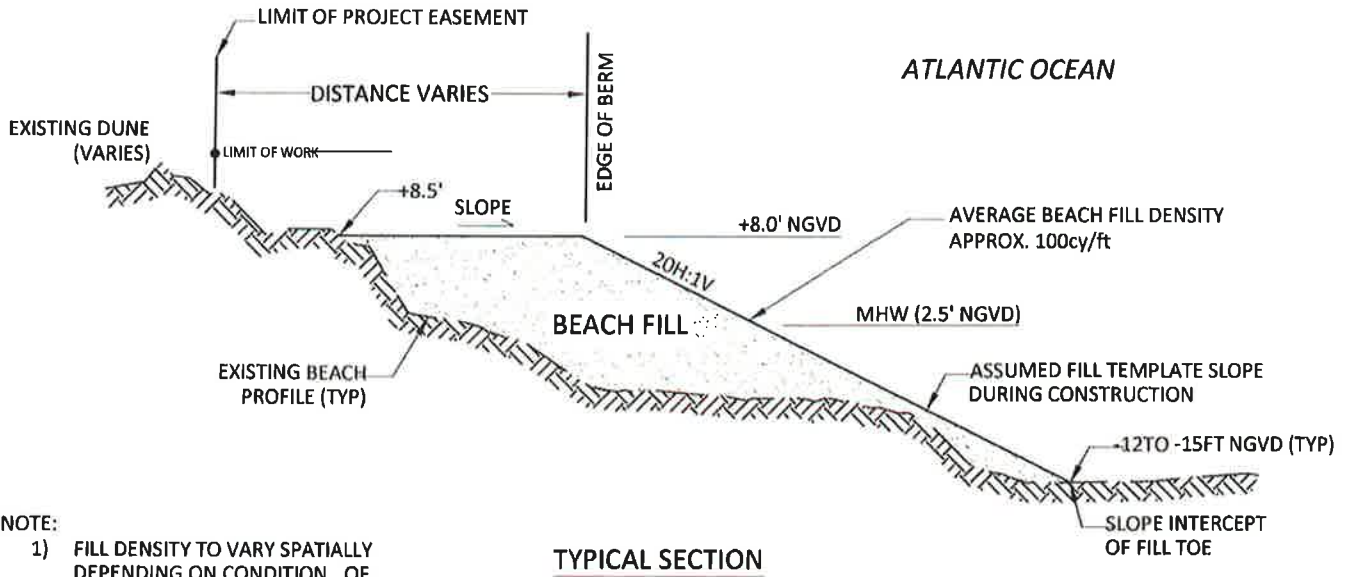
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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

SAND FILLET SECTIONS

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SOUTH BEACH



NOTE:

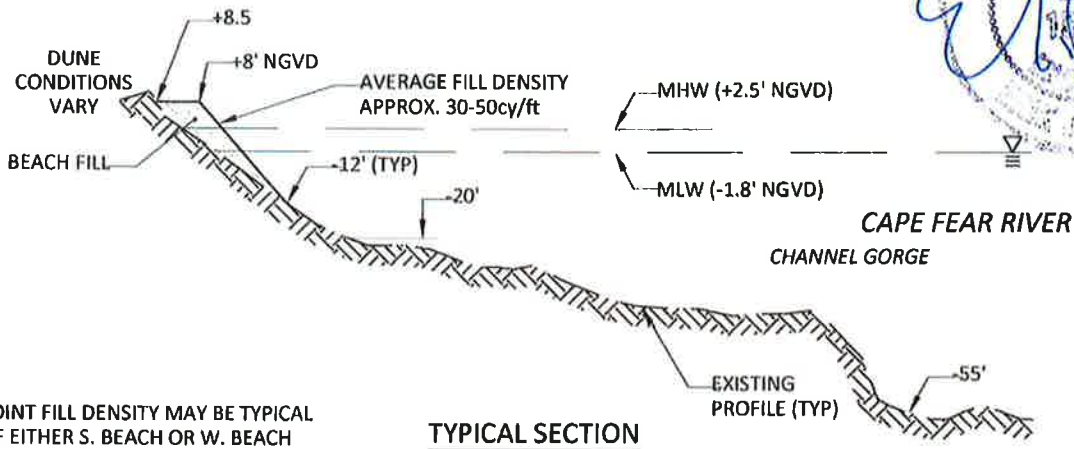
- 1) FILL DENSITY TO VARY SPATIALLY DEPENDING ON CONDITION OF BEACH AT TIME OF CONSTRUCTION.
- 2) GROIN FILLET FILL DENSITY VARIES AND MAY EXCEED 300 CY/FT

NTS
DATUM: NGVD 29

LOCAL TIDAL DATUMS (FT)

- MHHW +2.8
- MHW +2.5
- NAVD +1.1
- NGVD(29) 0.0
- MLW -1.8
- MLLW -2.0

WEST BEACH



NOTE:

- 1) POINT FILL DENSITY MAY BE TYPICAL OF EITHER S. BEACH OR W. BEACH



DATUM: NGVD 29

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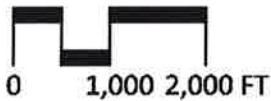
VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

TYPICAL BEACH FILL SECTIONS

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SHEET 11 of 21		



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 40+00
- STA 50+00
- STA 52+64
- STA 46+89
- STA 40+00
- STA 36+00
- STA 38+00
- STA 39+60
- STA 41+50
- STA 43+47
- STA 44+25
- STA 45+07
- STA 46+00
- STA 46+89
- STA 50+00
- STA 52+64
- STA 46+89
- STA 40+00
- STA 36+00
- STA 38+00
- STA 39+60
- STA 41+50
- STA 43+47
- STA 44+25
- STA 45+07
- STA 46+00
- STA 46+89
- STA 50+00
- STA 52+64

SOUTH BEACH

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

PROJECT BASELINE (STA 00+00)

WEST BEACH

THE POINT

- STA 00+00
- STA 04+00
- STA 08+00
- STA 12+00
- STA 16+00
- STA 20+00
- STA 24+00
- STA 28+00
- STA 32+00
- STA 36+00
- STA 38+00
- STA 39+60
- STA 41+50
- STA 43+47
- STA 44+25
- STA 45+07
- STA 46+00
- STA 46+89
- STA 50+00
- STA 52+64
- STA 46+89
- STA 40+00
- STA 36+00
- STA 38+00
- STA 39+60
- STA 41+50
- STA 43+47
- STA 44+25
- STA 45+07
- STA 46+00
- STA 46+89
- STA 50+00
- STA 52+64

CAPE FEAR RIVER

ATLANTIC OCEAN



OCTOBER 2006 PHOTOGRAPHY

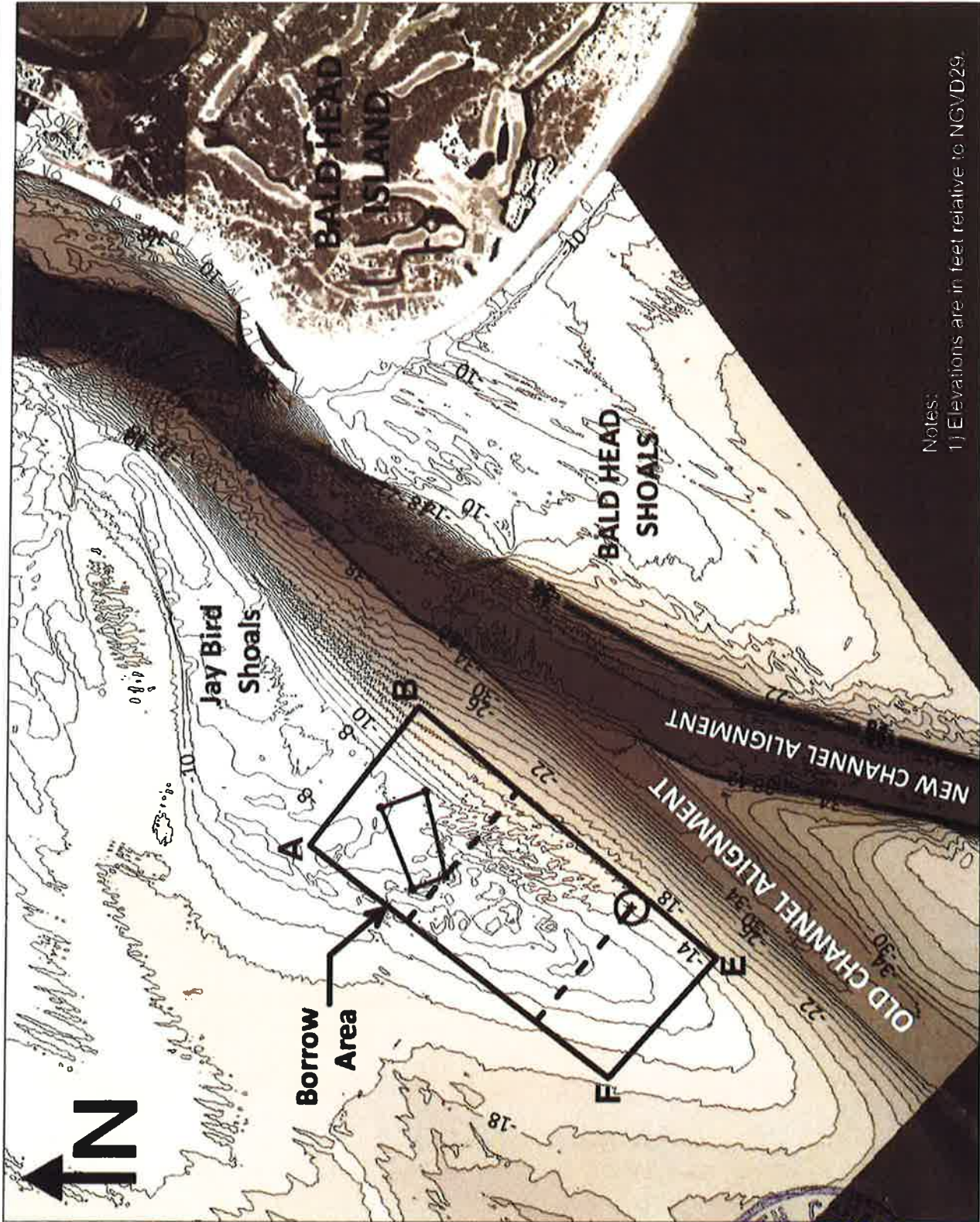
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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT
**PROJECT BASELINE
AND LIMITS OF FILL**

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

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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT

JAY BIRD SHOALS BORROW AREA

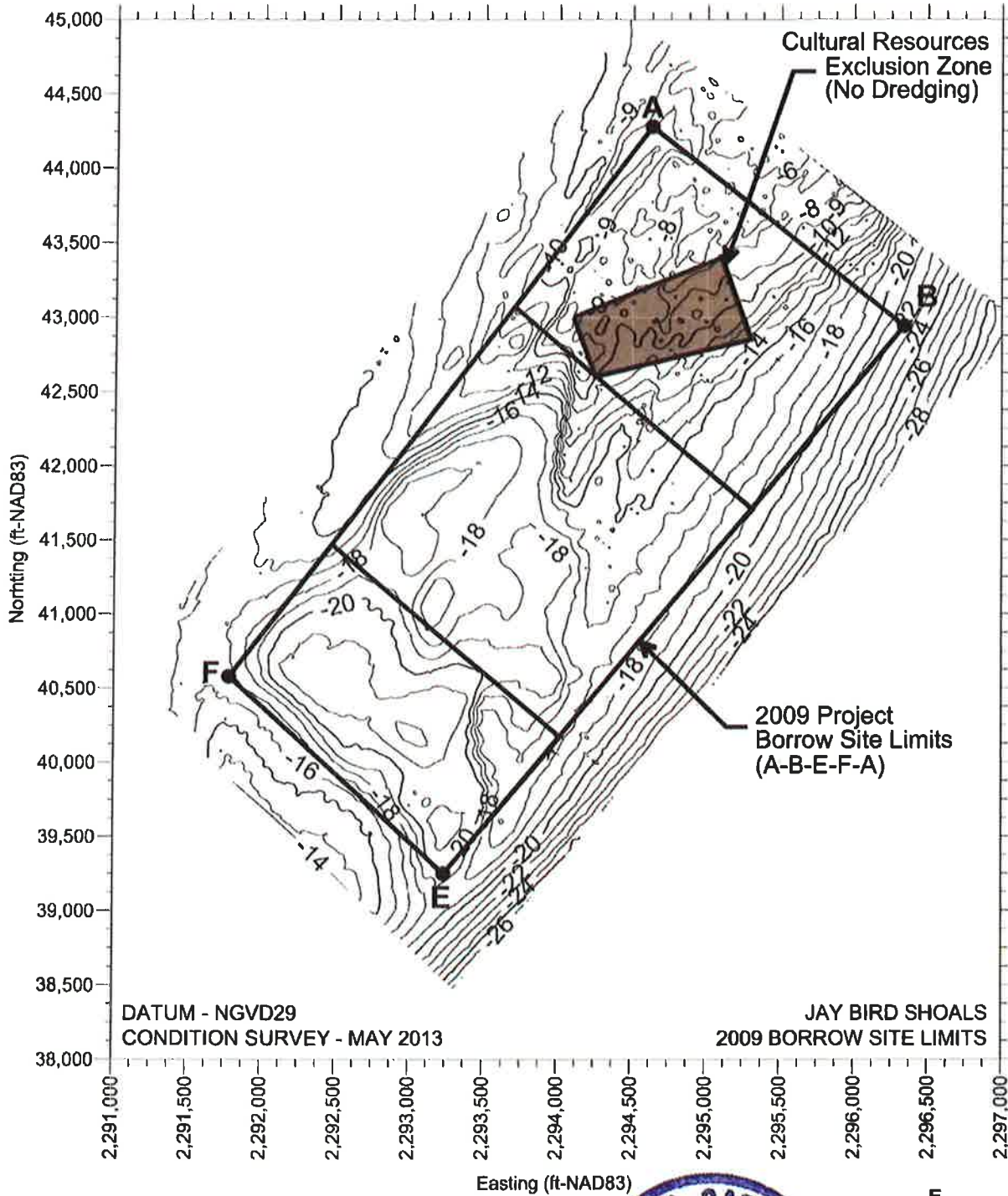


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**VBHI RESTORATION PROJECT
2009 BORROW SITE PERMITS:**

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

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	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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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

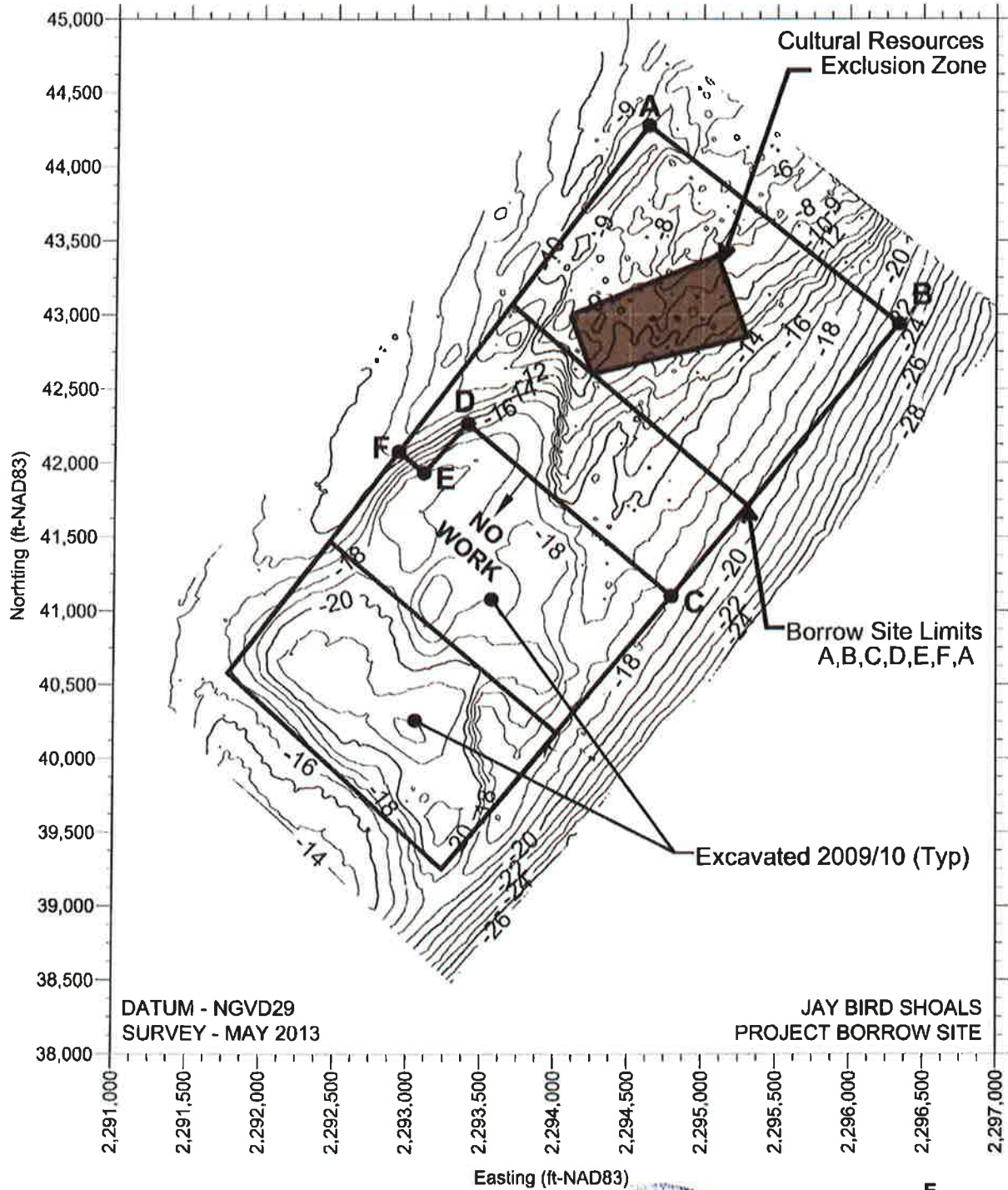
2013 BORROW AREA CONDITION SURVEY

DATE	APPROVED	REVISION

09/30/2013

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DATUM - NGVD29
SURVEY - MAY 2013

JAY BIRD SHOALS
PROJECT BORROW SITE

**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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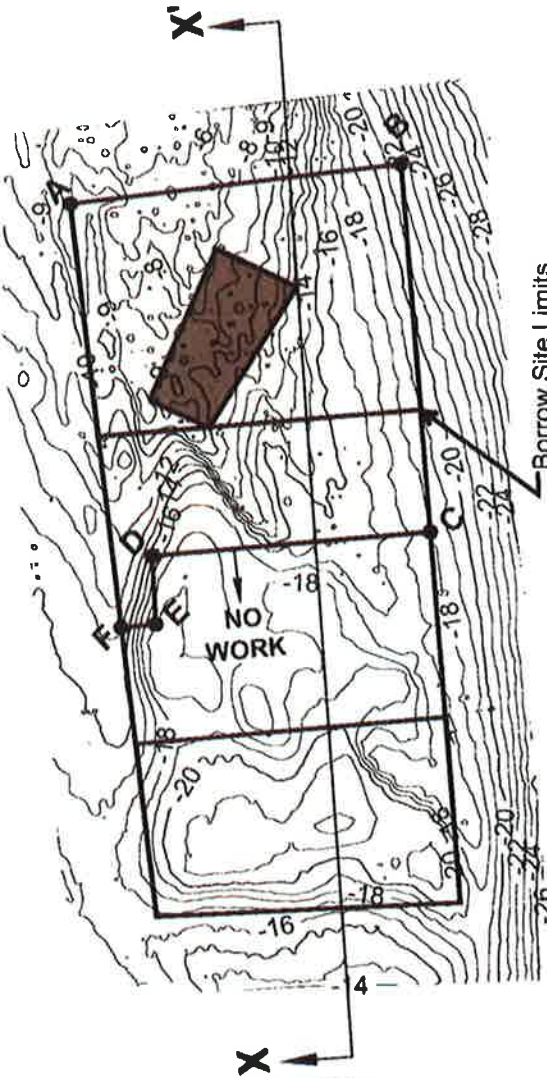
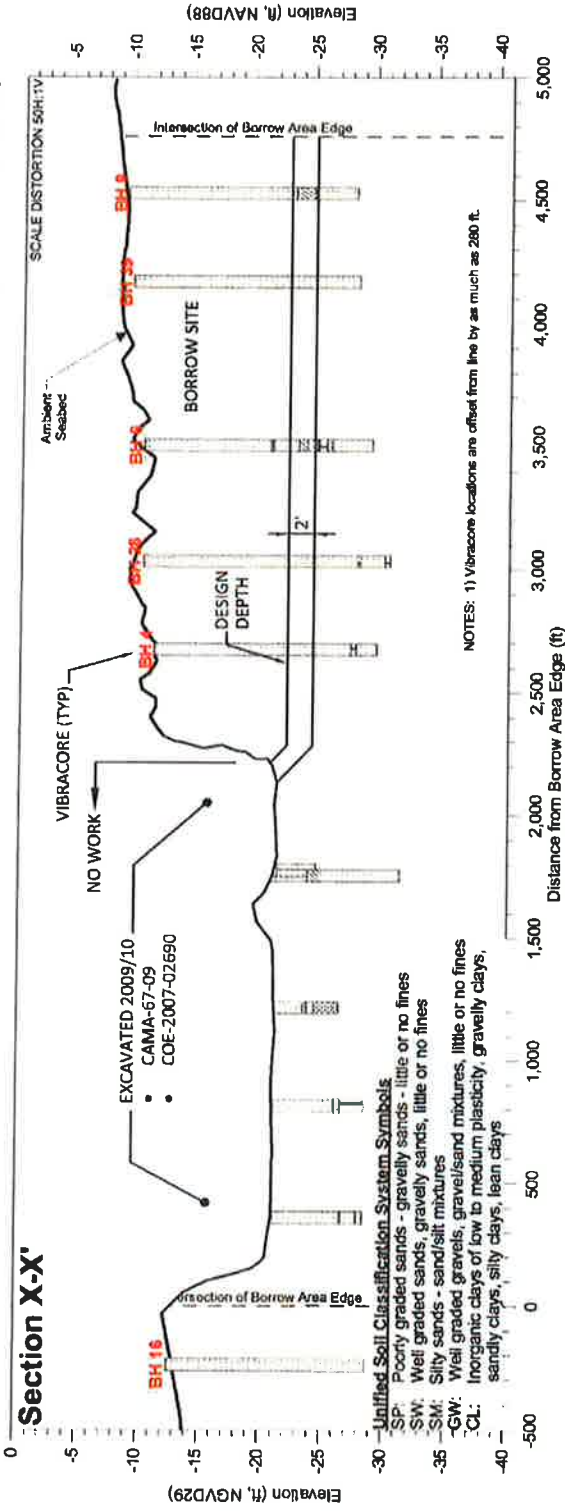
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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

PROJECT BORROW SITE

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JAY BIRD SHOALS



NOTES: 1) Vibracore locations are offset from line by as much as 280 ft.

Unified Soil Classification System Symbols
 SP: Poorly graded sands - gravelly sands - little or no fines
 SW: Well graded sands, gravelly sands, little or no fines
 SM: Silty sands - sand/silt mixtures
 GW: Well graded gravels, gravel/sand mixtures, little or no fines
 CL: Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays

EXCAVATED 2009/10
 • CAMA-67-09
 • COE-2007-02690

Section X-X'

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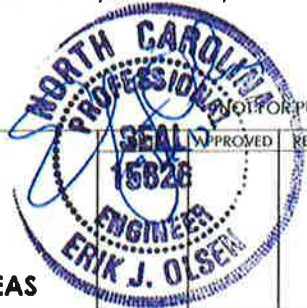
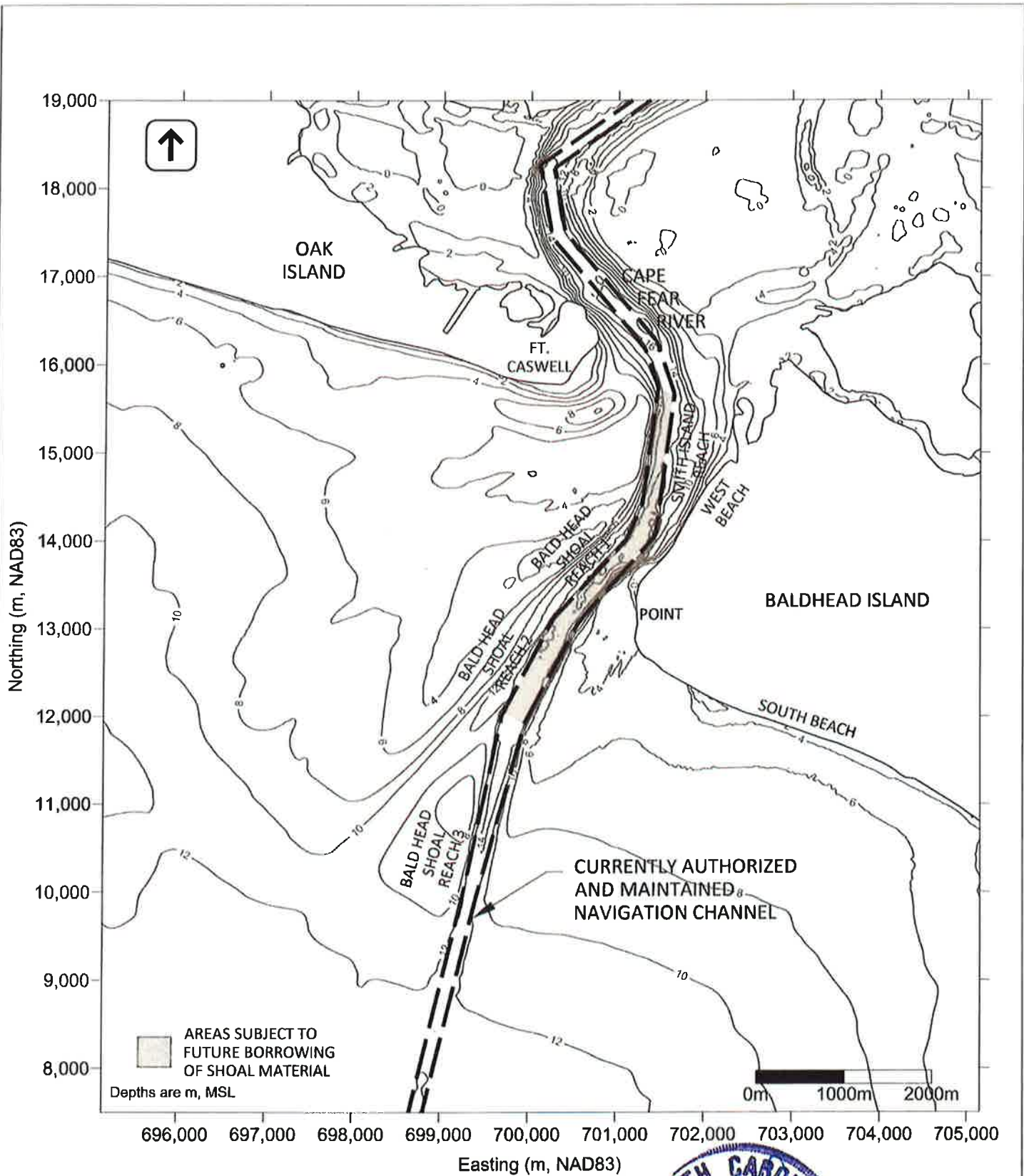
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**VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT**

BORROW SITE TYPICAL SECTION



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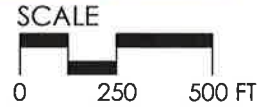
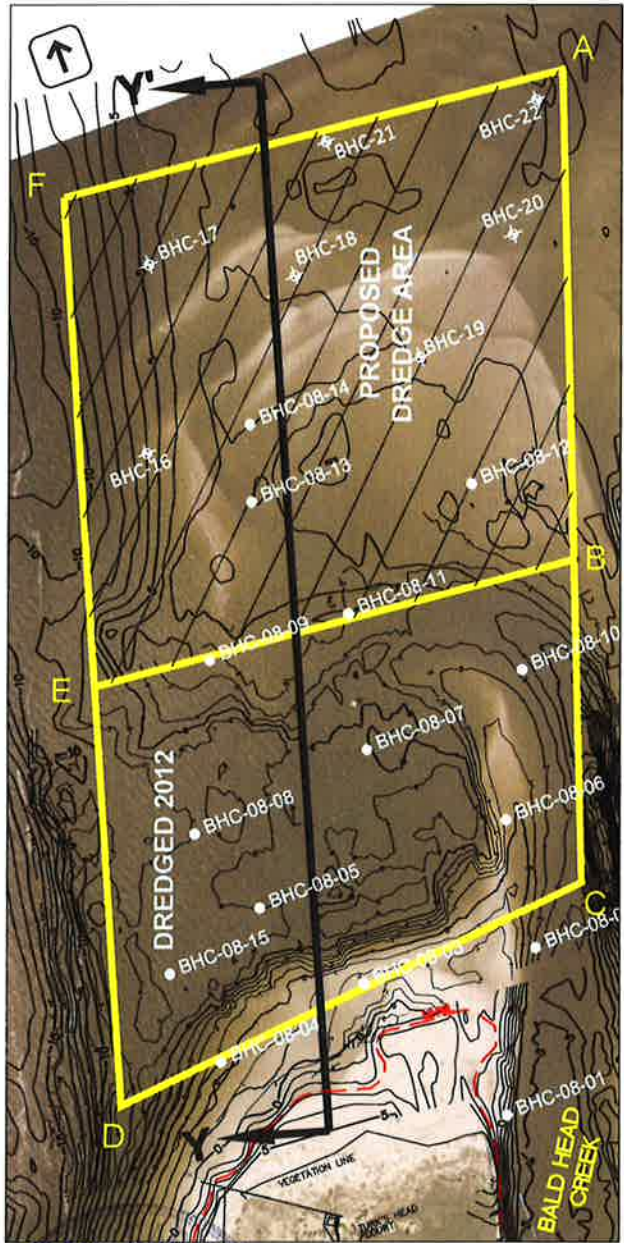
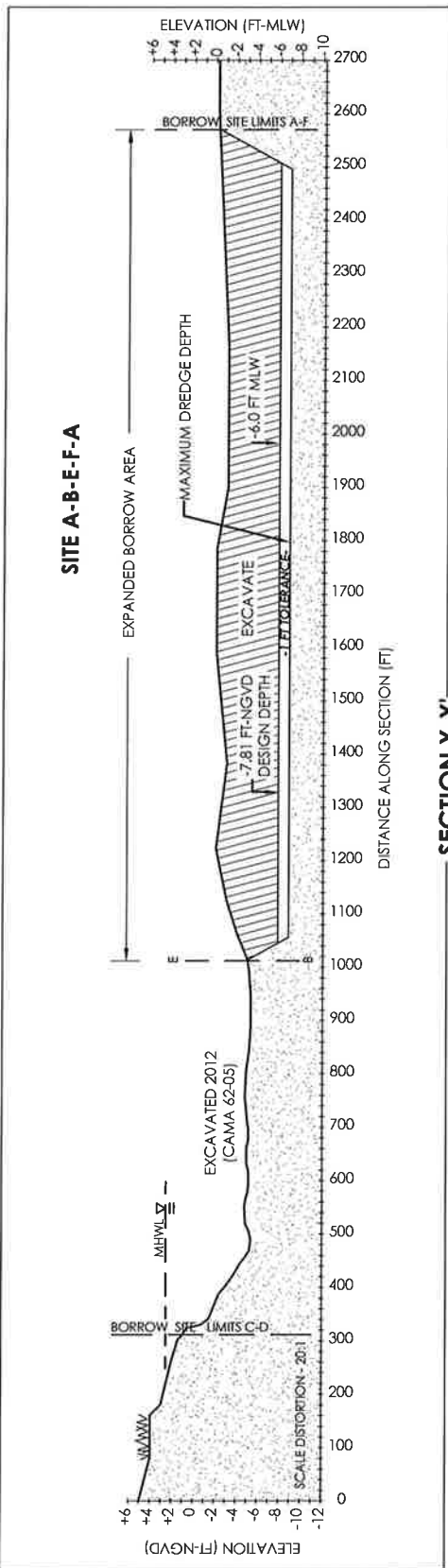


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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
NAVIGATION PROJECT BORROW AREAS

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SURVEY - NGVD29
 PHOTO - MAY, 2013

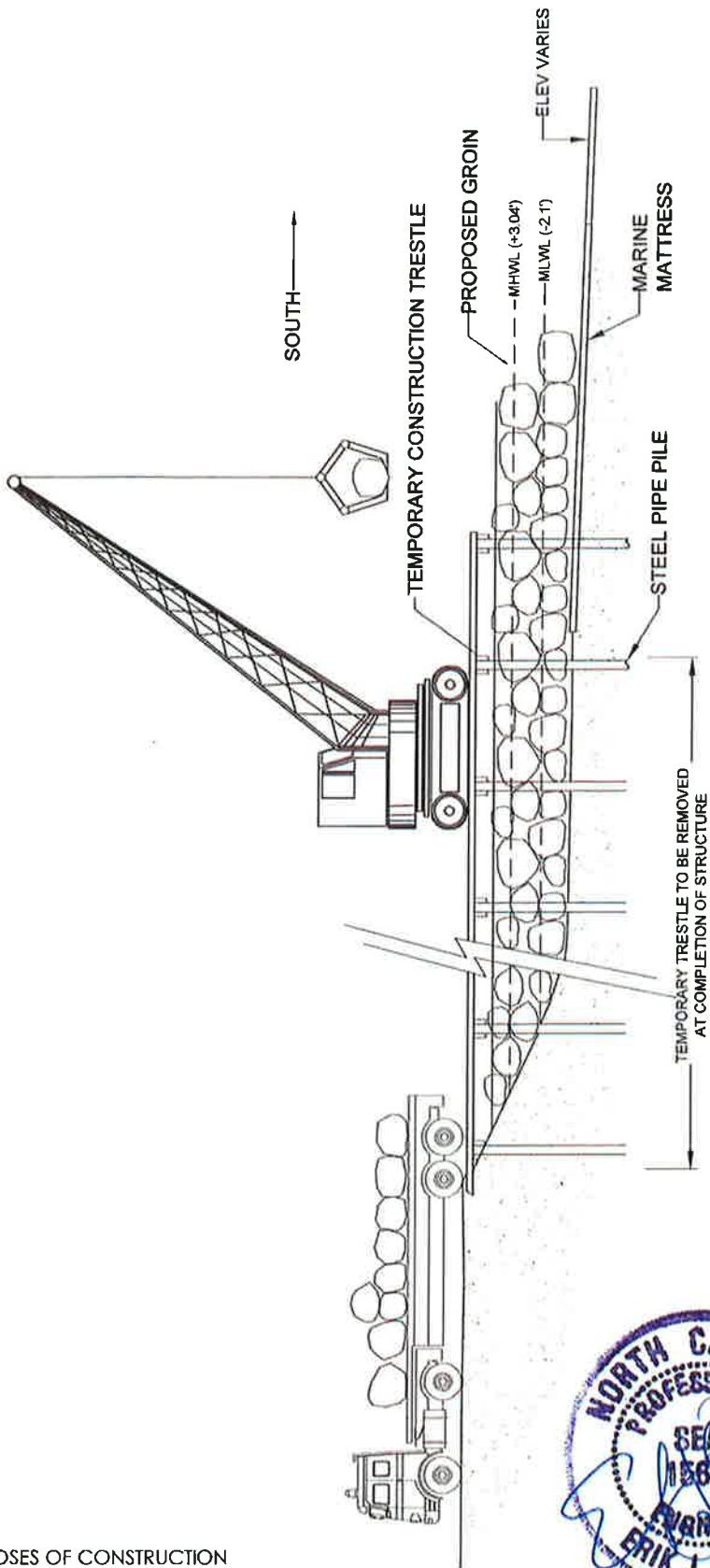
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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
BALD HEAD CREEK BORROW SITE
TYPICAL SECTION

DATE	APPROVED	REVISION	
05-01-2014	EJO	1	10/18/13
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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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VILLAGE OF BALD HEAD ISLAND
TERMINAL GROIN PROJECT

TEMPORARY TRESTLE

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		09/30/2013
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NOTES:

- 1) FILL PAD SAND TO BE SOURCED FROM DISPOSAL BERM (ABOVE MHWL).
- 2) FILL PAD TO ALLOW CONTRACTOR EQUIPMENT ACCESS FOR ROCK PLACEMENT SEAWARD OF THE MLWL (OPTIONAL)

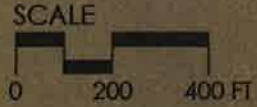


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VILLAGE OF BALD HEAD ISLAND
 TERMINAL GROIN PROJECT
PHASE I GROIN FILL PAD (OPTION)



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