



US Army Corps
Of Engineers
Wilmington District

PUBLIC NOTICE

Issue Date: August 28, 2015
Comment Deadline: October 13, 2015
Corps Action ID Number: SAW-2011-01914

The Wilmington District, Corps of Engineers (Corps) received an application from the Town of Holden Beach (Town) seeking Department of the Army authorization to discharge fill material into waters of the United States, associated with the construction of a 700-ft-long terminal groin with a 300-ft shore anchorage system and associated long-term beach nourishment component, in order to address erosion and protect infrastructure, roads, homes, beaches, dunes and wildlife habitat in Holden Beach, Brunswick County, North Carolina. Specific plans and location information are described below and shown on the attached plans.

This notice serves to announce receipt of a DA permit application in accordance with 33 CFR 325.3, and release of the draft Environmental Impact Statement (DEIS) for this project in accordance with 33 CFR 325 Appendix B, and 40 CFR 1502.19 - 1506.10. Comments will be received for 45 days, with an end comment period date of October 13, 2015. A public hearing to receive public comment will be held at the Holden Beach Town Hall at 110 Rothschild Street, Holden Beach, NC 28462, on September 24th, at 6:00pm. Beginning August 28, 2015, the DEIS may be obtained from the following link: <http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/MajorProjects>. Comments received from the DEIS will be used in the development of a Final EIS (FEIS) for this project.

APPLICANT:

Town of Holden Beach
Attn: Mr. David Hewett, Town Manger

AGENT (if applicable):

Dial Cordy & Associates
Attn: Mrs. Dawn York, Project Manager

Authority

The Corps evaluates this application and decides whether to issue, conditionally issue, or deny the proposed work pursuant to applicable procedures of the following Statutory Authorities:

- ☒ Section 404 of the Clean Water Act (33 U.S.C. 1344)
- ☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- ☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413)

Location

The project site is located on the eastern portion of Holden Beach and within the Lockwood Folly Inlet complex, and will encompass approximately 1.0 mile of oceanfront shoreline on Holden Beach, Brunswick County, North Carolina.

Directions to Site: Holden Beach, North Carolina, is located 35 miles south of Wilmington, NC and 40 miles north of Myrtle Beach, SC. From Wilmington, take US Highway 17 to Stone Chimney Rd SE to Holden Beach. Take a left on Ocean Blvd E (State Rd 1116) and drive east to the end. Public parking access is located just past Avenue D.

| | |
|---|----------------------------|
| Project Area (acres): 1,655 ac | Nearest Town: Holden Beach |
| Nearest Waterway: Atlantic Ocean | River Basin: Lumber |
| Latitude and Longitude: 33.914483N, -78.244248W | |

Existing Site Conditions

The barrier islands of Holden Beach (eight miles long) and Oak Island (12 miles long) are located west of the Cape Fear River and have an east-west orientation, facing Long Bay and the Atlantic Ocean to the south, and separated from mainland Brunswick County to the north by tidal marshes and the Atlantic Intracoastal Waterway (AIWW). Holden Beach and Oak Island are separated by the Lockwood Folly Inlet (LFI). The relatively narrow subaerial ocean beach along the eastern end of Holden Beach is backed by a narrow line of low vegetated foredunes and wide interior parabolic dunes that protrude northward towards the AIWW. The majority of the interior dunes have been fully or partially developed for residential use. The interior dunes are backed by a narrow fringe of tidal marsh that separates the island from the AIWW. The AIWW extends east across LFI and behind the west end of Oak Island where it crosses the Lower Lockwood Folly River. The west end of Oak Island is backed by a narrow fringe of tidal marsh that separates the island from a waterway known as the Eastern Channel. A spoil island-marsh complex known as Sheep Island lies between the Eastern Channel and the AIWW to the north. The Lower Lockwood Folly River estuary to the north of the AIWW contains an expansive estuarine complex of marsh islands, sandy shoals, shellfish beds, and tidal creeks.

The marine component of the Permit Area encompasses the subtidal ocean bottom (benthic) and ocean water column (pelagic) habitats and communities that occur seaward of the intertidal ocean beach to approximately the 40-ft isobath on the inner continental shelf of Long Bay. The shoreface and inner shelf along Holden Beach contain underlying ancient hard strata (sandstones and limestones) that are covered by a thin and discontinuous veneer of modern sand.

The Permit Area includes a variety of biotic community types and sizes:

Biotic communities in the Permit Area.

| Habitat Type | Size (ac) |
|----------------------|------------------|
| Residential | 107.3 |
| Beach and Foredune | 70.0 |
| Dune Grasses | 34.4 |
| Upland Mixed Forest | 35.1 |
| Upland Shrub-Scrub | 70.5 |
| Wetland Mixed Forest | 59.3 |
| Wetland Shrub-Scrub | 19.6 |
| Low Marsh | 148.2 |
| Intertidal | 208.8 |
| Subtidal | 902.7 |

Applicant's Stated Purpose

The purpose of the Proposed Action is to establish a comprehensive shoreline protection program, under the independent authority of the Town of Holden Beach, which will restore and maintain the East End beach and provide for the short- and long-term protection of residential structures, Town infrastructure, and recreational assets. The Proposed Action is needed to mitigate ongoing and chronic East End shoreline erosion, which is projected to continue for the foreseeable future and threatens residential structures, Town infrastructure, recreational assets, and natural resources. Furthermore, based on the increasing need for additional shore protection beyond that provided by federal beneficial use placements, and the trend of declining federal funding for nourishment projects, an independent shore protection program under the authority of the Town is needed to ensure that the East End shoreline will be adequately protected.

Project Description

In June 2011, Senate Bill 110 authorized the permitting of terminal groins at four (4) inlets in North Carolina. As part of the Senate Bill, requests for terminal groins must include the following provisions: a monitoring plan; a baseline for assessing adverse impacts and thresholds for when adverse impacts must be mitigated; a description of mitigation measures to be undertaken should the impact thresholds be reached; and a plan to modify or remove the terminal groin if adverse impacts cannot be mitigated.

The following additional alternatives are being considered in the evaluation of the least environmentally damaging practicable alternative:

Alternative 1 - No Action (Status-Quo)

Under the No-Action Alternative (Alternative 1), the Town would continue to rely solely on the Corps' beneficial use projects for shore protection of the East End of Holden Beach. Since 2002, the East End has been nourished nine times with dredged material derived from the AIWW Lockwood Folly Inlet Crossing (LFI) navigation channel. On average, these nourishment events placed ~77,000 cy of dredged material on the East End of Holden Beach at two-year intervals.

Alternative 2 - Abandon and Retreat

Under Alternative 2, the Town would not pursue a long-term management plan, and there would not be any Federally implemented or federally permitted actions undertaken to mitigate erosion along the East End of Holden Beach. Thus, the Corps would not conduct any East End Beneficial Use Projects, and the Town would not implement any actions, such as beach nourishment, beach scraping, dune restoration, temporary sandbag placement, and inlet dredging, which require a federal dredge and fill permit.

Instead, the Town would develop and implement a 30-year managed retreat plan under which structures that are threatened with erosional damage would be either relocated to unimproved interior lots or demolished. This plan would establish an erosional threshold that would trigger preemptive relocations or demolitions prior to the point of imminent structural failure.

Alternative 3 - Beach Nourishment

Under Alternative 3, the Town would assume responsibility for East End shore protection through the implementation of an independent, 30-year nourishment-only beach management plan. Under the proposed plan, the East End of Holden Beach would be nourished with ~100,000 to 150,000 cy of sand every two years. The conceptual beach

fill placement area encompasses ~3,700 linear ft of the East End oceanfront beach between Blockade Runner Drive (~Station 00 + 40) and LFI (~Station 00 + 10). The preferred source of beach fill under Alternative 3 would be the LFIX navigation channel and associated 400-ft bend widener.

Alternative 4 - Inlet Management and Beach Nourishment

Under Alternative 4, the Town would assume responsibility for shore protection of the East End of Holden Beach through the implementation of an independent, 30-year inlet management and beach nourishment plan. The anticipated management regime would involve periodic relocations of the LFI outer ebb channel and concurrent East End nourishment events approximately every two years. Outer inlet channel relocation events would involve the construction of a wider and deeper outer channel with a more westerly alignment towards the inlet shoulder of Holden Beach. The new channel would be dredged to a uniform depth of 14 ft (MLW) and would have a variable width ranging from ~350 ft at the inlet throat to ~850 ft at the 14-ft isobaths.

Alternative 5 - Short Terminal Groin and Beach Nourishment

Under Alternative 5, the Town would assume responsibility for shore protection of the East End of Holden Beach through the construction of an ~800-ft-long “short” terminal groin at the eastern end of the oceanfront beach between Stations 10+00 and 20+00 and the implementation of an independent, 30-year beach nourishment plan. The main stem of the short terminal groin would include a 550-ft-long segment extending seaward from the toe of the primary dune and a ~250-ft-long anchor segment extending landward from the toe of the primary dune. The groin would also include a 250-ft-long shore-parallel T-Head segment centered on the seaward terminus of the main stem.

Nourishment events would place ~100,000 to 150,000 cy of sand on the east end of Holden Beach every four years. The initial nourishment event would include the construction of a wedged-shaped “groin fillet” sediment feature that would establish a gradual, transitional shoreline between the western end of the beach fill footprint and the seaward terminus of the short groin. The proposed borrow site dredging regime under Alternative 5 would involve the extraction of ~120,000 to 180,000 cy of sand from the preferred LFIX/bend-widener borrow site every four years with the addition of potential supplemental sand acquisition from the inland LFI navigation channel and the Central Reach offshore borrow site.

Alternative 6 - Intermediate Terminal Groin and Beach Nourishment (Applicant's Preferred Alternative)

Under Alternative 6, the Town would assume responsibility for shore protection of the East End of Holden Beach through the construction of a ~1,000-ft-long intermediate terminal groin at the eastern end of the oceanfront beach between Stations 00+00 and 10+00 and the implementation of an independent, 30-year beach nourishment plan. The main stem of the intermediate terminal groin would include a 700-ft-long segment extending seaward from the toe of the primary dune and a ~300-ft anchor segment extending landward from the toe of the primary dune. The groin would also include a 120-ft-long shore-parallel T-Head segment centered on the seaward terminus of the main stem.

The projected beach nourishment regime would involve the placement of ~100,000 to 150,000 cy of sand on the East End of Holden Beach every four years. The beach fill profile design would be similar to that of Alternatives 3, 4, and 5 and include a +9-ft NAVD high dune with a 50-ft-wide crest, a +7-ft NAVD high, 200-ft-wide berm, and a 90- to 200-ft-wide transition with a 15 percent slope. The anticipated borrow sites and dredging regimes would be the same as those described under Alternative 5.

Avoidance and Minimization

The applicant provided the following information in support of efforts to avoid and/or minimize impacts to the aquatic environment: The Applicant has completed an Inlet Management Plan (IMP) that provides detailed information regarding required plan components including: (1) determination and type of data to define the baseline condition; (2) post-construction monitoring to compare baseline data and assess potential adverse impacts; (3) timeframes for post-construction monitoring; (4) identification of thresholds for implementation of mitigation measures; and (5) mitigation measures that may be implemented. In addition, terminal groin construction and beach fill placement activities would adhere to a 16 November to 30 April environmental window; thereby avoiding the sea turtle nesting season, the majority of the shorebird breeding season, the majority of the seabeach amaranth growing season, and peak benthic invertebrate recruitment periods.

Compensatory Mitigation

The applicant offered the following compensatory mitigation plan to offset unavoidable functional loss to the aquatic environment: The project as proposed will not impact wetlands. Therefore, no compensatory mitigation will be required for the applicant's project as proposed. Changes to the project and/or additional information received which suggest impacts to wetlands and or waters of the United States, will warrant further

evaluation for avoidance and minimization of wetland impacts and any compensatory mitigation.

Essential Fish Habitat

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, this Public Notice initiates the Essential Fish Habitat (EFH) consultation requirements. The Corps' initial determination is that the proposed project may adversely affect EFH or associated fisheries managed by the South Atlantic or Mid Atlantic Fishery Management Councils or the National Marine Fisheries Service. Consultation with the National Marine Fisheries Service on EFH will be requested under separate letter.

Cultural Resources

Pursuant to Section 106 of the National Historic Preservation Act of 1966, Appendix C of 33 CFR Part 325, and the 2005 Revised Interim Guidance for Implementing Appendix C, the District Engineer consulted district files and records and the latest published version of the National Register of Historic Places and initially determines that:

- ☐ Should historic properties, or properties eligible for inclusion in the National Register, be present within the Corps' permit area; the proposed activity requiring the DA permit (the undertaking) is a type of activity that will have no potential to cause an effect to an historic properties.
- ☐ No historic properties, nor properties eligible for inclusion in the National Register, are present within the Corps' permit area; therefore, there will be no historic properties affected. The Corps subsequently requests concurrence from the SHPO (or THPO).
- ☐ Properties ineligible for inclusion in the National Register are present within the Corps' permit area; there will be no historic properties affected by the proposed work. The Corps subsequently requests concurrence from the SHPO (or THPO).
- ☒ Historic properties, or properties eligible for inclusion in the National Register, are present within the Corps' permit area; however, the undertaking will have no adverse effect on these historic properties. The Corps subsequently requests concurrence from the SHPO (or THPO).
- ☐ Historic properties, or properties eligible for inclusion in the National Register, are present within the Corps' permit area; moreover, the undertaking may have an adverse effect on these historic properties. The Corps subsequently initiates consultation with the SHPO (or THPO).
- ☐ The proposed work takes place in an area known to have the potential for the presence of prehistoric and historic cultural resources; however, the area has not been formally surveyed for the presence of cultural resources. No sites eligible

for inclusion in the National Register of Historic Places are known to be present in the vicinity of the proposed work. Additional work may be necessary to identify and assess any historic or prehistoric resources that may be present.

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.

Endangered Species

Pursuant to the Endangered Species Act of 1973, the Corps reviewed the project area, examined all information provided by the applicant and consulted the latest North Carolina Natural Heritage Database. Based on available information:

- ☐ The Corps determines that the proposed project would not affect federally listed endangered or threatened species or their formally designated critical habitat.
- ☒ The Corps determines that the proposed project may affect federally listed endangered or threatened species or their formally designated critical habitat. Initiation of formal consultation, pursuant to Section 7, ESA, will be requested with the U.S. Fish and Wildlife Service under separate letter for effects on nesting sea turtles and critical habitat. Also, informal consultation and a concurrence determination that the project may affect, but is not likely to adversely affect whales, marine sea turtles, seabeach amaranth, red knot, piping plover, Atlantic sturgeon, and manatee will be coordinated with the National Marine Fisheries Service and U.S. Fish and Wildlife Service under separate letters. The Federal resource agencies (i.e., FWS and NMFS) will be requested to initiate consultation under Section 7 of the ESA on the above effect determinations. The Corps will not make a permit decision until the consultation process is complete.
- ☐ The Corps is not aware of the presence of species listed as threatened or endangered or their critical habitat formally designated pursuant to the Endangered Species Act of 1973 (ESA) within the project area. The Corps will make a final determination on the effects of the proposed project upon additional review of the project and completion of any necessary biological assessment and/or consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service.

Other Required Authorizations

The Corps forwards this notice and all applicable application materials to the appropriate State agencies for review.

North Carolina Division of Water Resources (NCDWR): The Corps will generally not make a final permit decision until the NCDWR issues, denies, or waives the state Certification as required by Section 401 of the Clean Water Act (PL 92-500). The receipt of the application and this public notice, combined with the appropriate application fee, at the NCDWR Central Office in Raleigh constitutes initial receipt of an application for a 401 Certification. A waiver will be deemed to occur if the NCDWR fails to act on this request for certification within sixty days of receipt of a complete application. Additional information regarding the 401 Certification may be reviewed at the NCDWR Central Office, 401 and Buffer Permitting Unit, 512 North Salisbury Street, Raleigh, North Carolina 27604-2260. All persons desiring to make comments regarding the application for a 401 Certification should do so, in writing, by October 13, 2015 to:

NCDWR Central Office
Attention: Ms. Karen Higgins, 401 and Buffer Permitting Unit
(USPS mailing address): 1617 Mail Service Center, Raleigh, NC 27699-1617

Or,

(physical address): 512 North Salisbury Street, Raleigh, North Carolina 27604

North Carolina Division of Coastal Management (NCDCM):

- ☒ The application did not include a certification that the proposed work complies with and would 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 Department of Army (DA) permit for the proposed work until the applicant submits such a certification to the Corps and the NCDCM, and the NCDCM notifies the Corps that it concurs with the applicant's consistency certification. As the application did not include the consistency certification, the Corps will request, upon receipt, concurrence or objection from the NCDCM.
- ☐ Based upon all available information, the Corps determines that this application for a Department of Army (DA) permit does not involve an activity which would affect the coastal zone, which is defined by the Coastal Zone Management (CZM) Act (16 U.S.C. § 1453).

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

The Corps of Engineers is soliciting comments from the public; Federal, State and local agencies and officials, including any consolidated State Viewpoint or written position of the Governor; Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. 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 (EA) and/or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Requests for a public hearing shall be granted, unless the District Engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing.

The Corps of Engineers, Wilmington District will receive written comments pertinent to the proposed work, as outlined above, and on the DEIS for this project, for 45 days and until 5pm, October 13, 2015. Comments should be submitted to Mrs. Emily Hughes, Wilmington Regulatory Field Office, 69 Darlington Avenue, Wilmington, North Carolina 28403 , at (910) 251-4635, or by email at: Emily.b.hughes@usace.army.mil

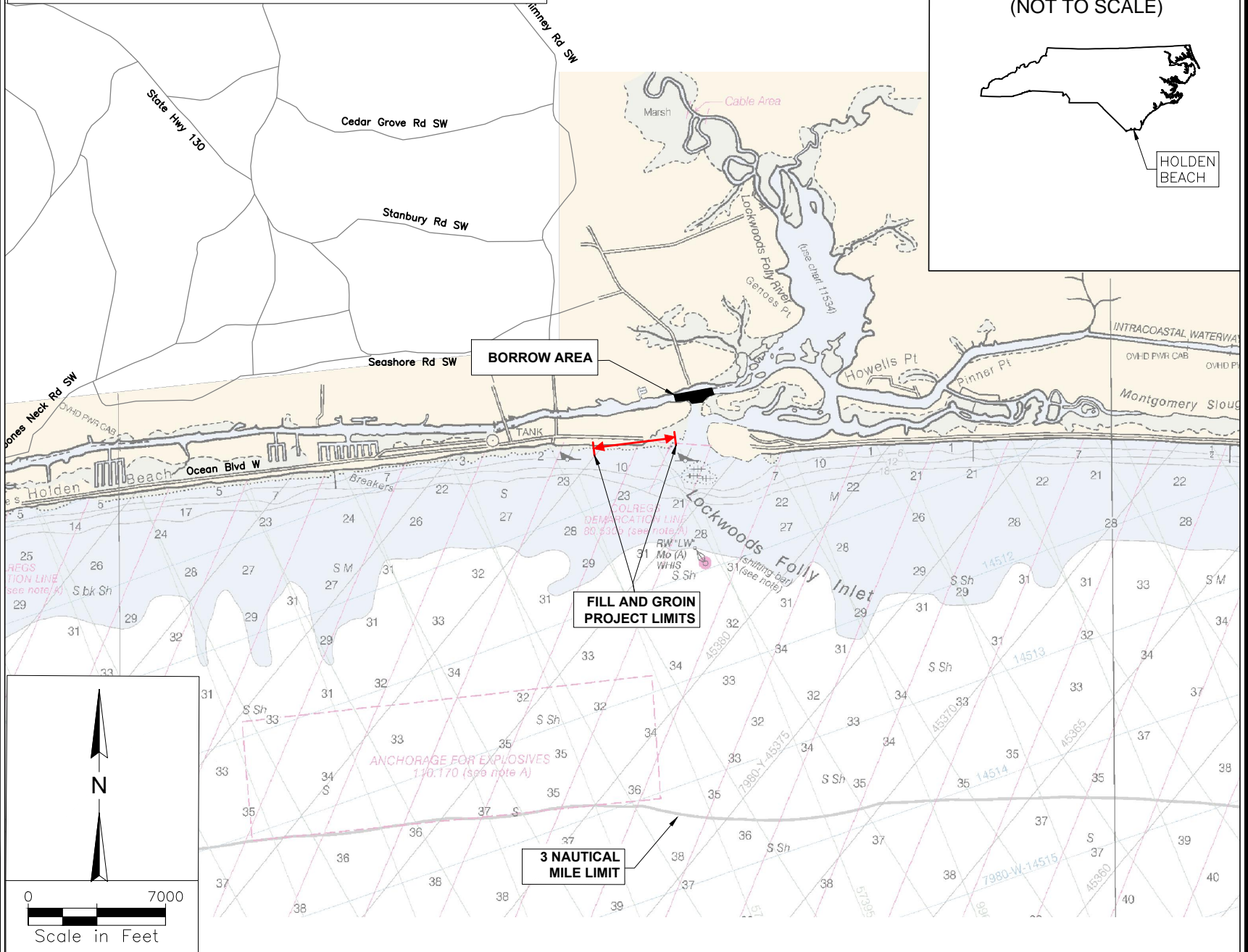
LOCATION MAP
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 08-1687
 ISSUE DATE: 08-11-2015
 SHEET NUMBER: 1

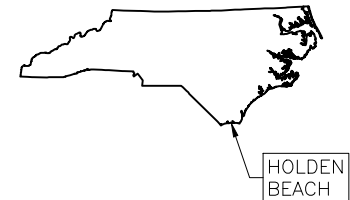
APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHSCHILD STREET
 HOLDEN BEACH, NC 28462

NOTES:

1. FOR PERMITTING ONLY, NOT FOR CONSTRUCTION PURPOSES
2. BACKGROUND MAP NOAA CHART #11536



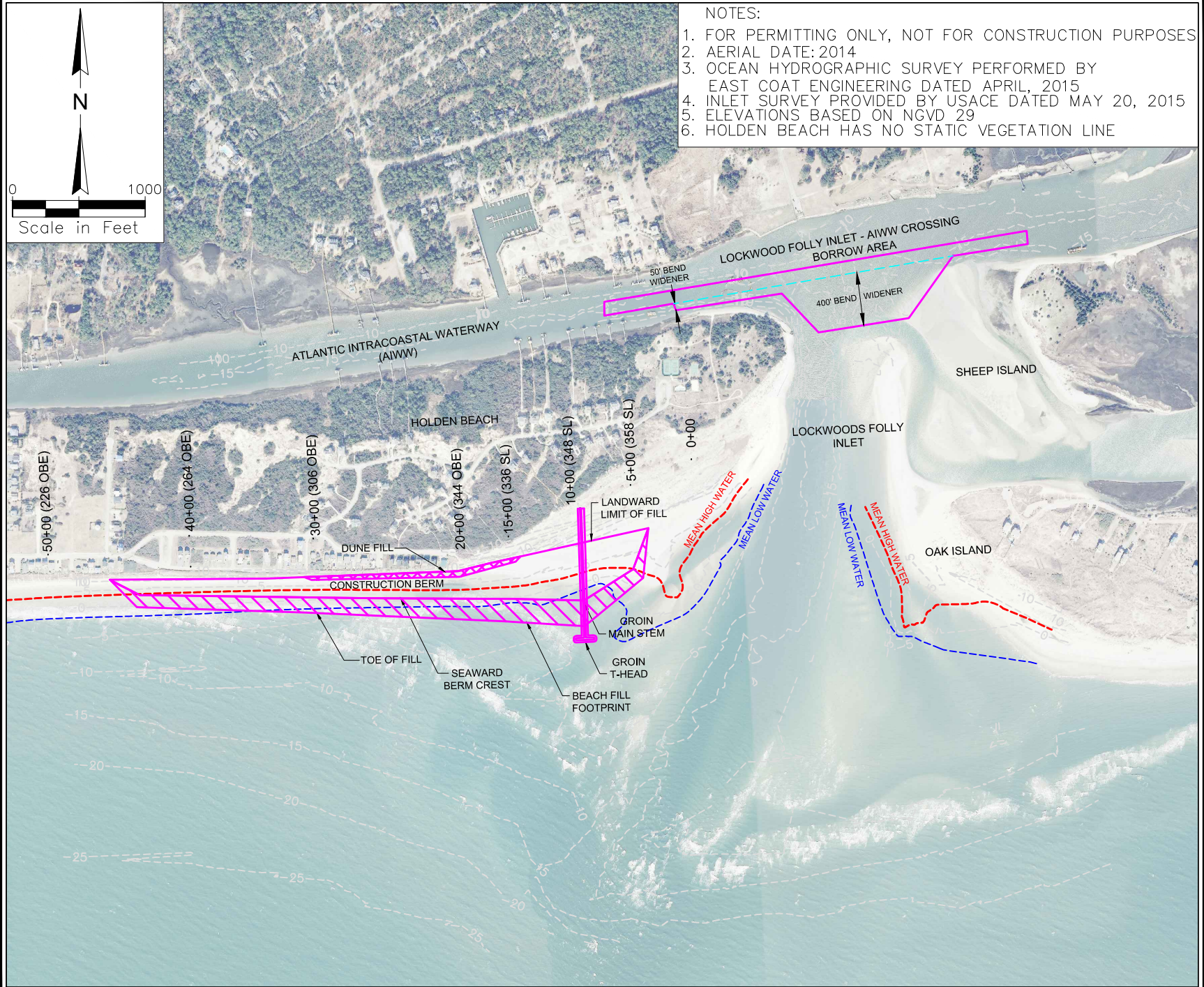
NORTH CAROLINA
 (NOT TO SCALE)



PROPOSED PROJECT OVERVIEW
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 06-1667
 ISSUE DATE: 06-11-2015
 SHEET NUMBER: 2

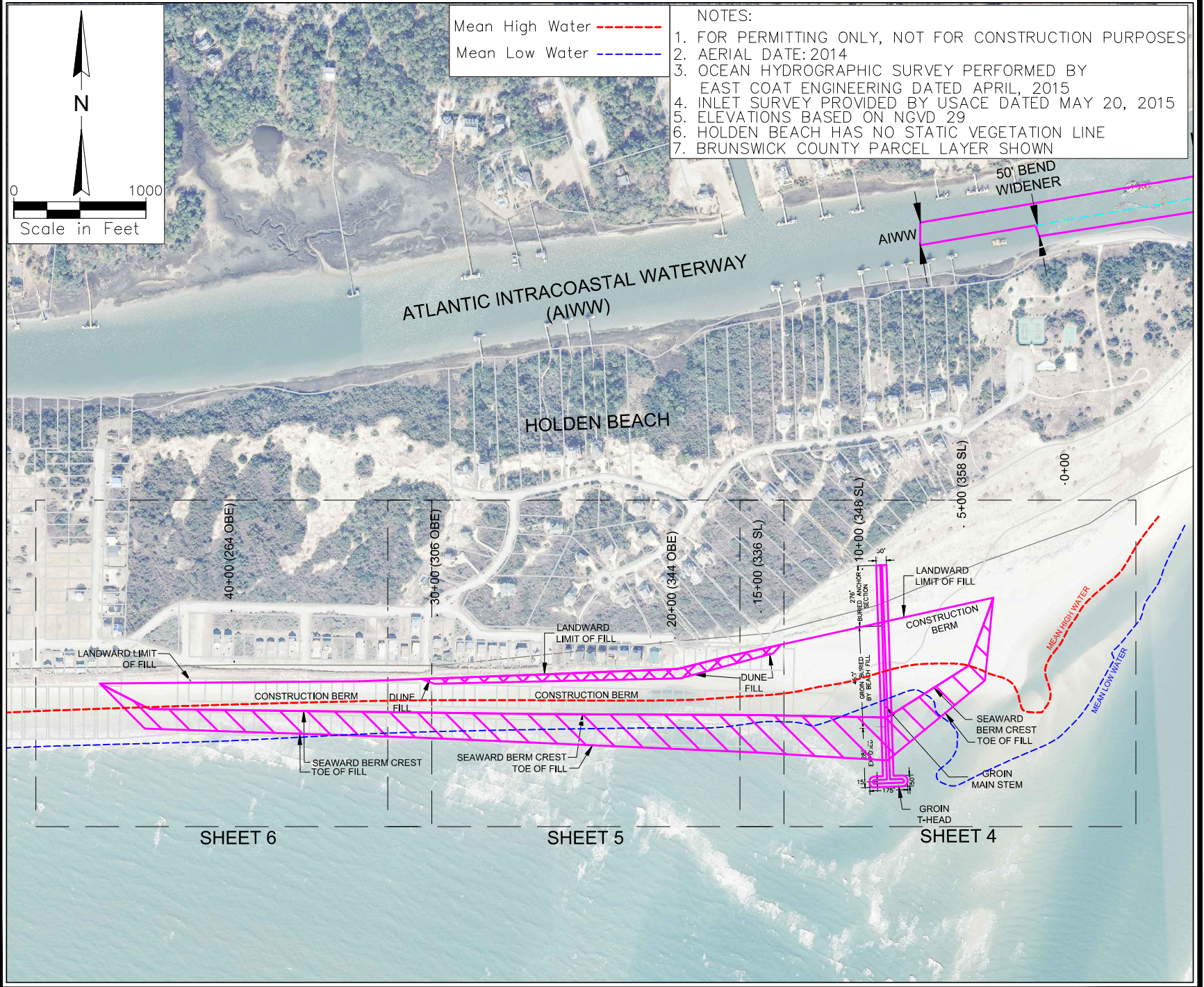
APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHSCHILD STREET
 HOLDEN BEACH, NC 28462



PROPOSED PROJECT
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 08-1687
 ISSUE DATE: 08-11-2015
 SHEET NUMBER: 3

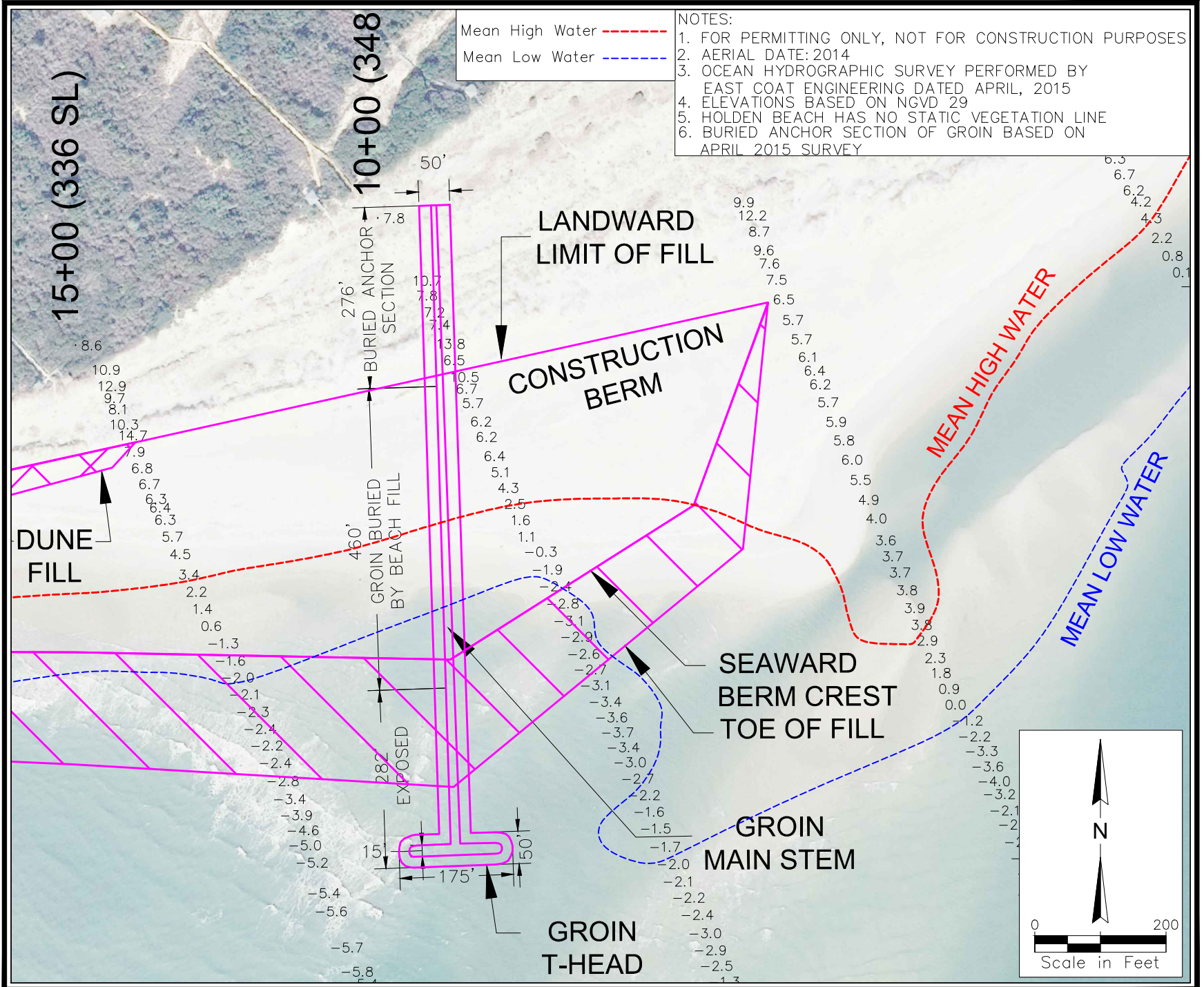
APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHSCHILD STREET
 HOLDEN BEACH, NC 28462



PROPOSED PROJECT
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 06-1667
 ISSUE DATE: 06-11-2015
 SHEET NUMBER: 4

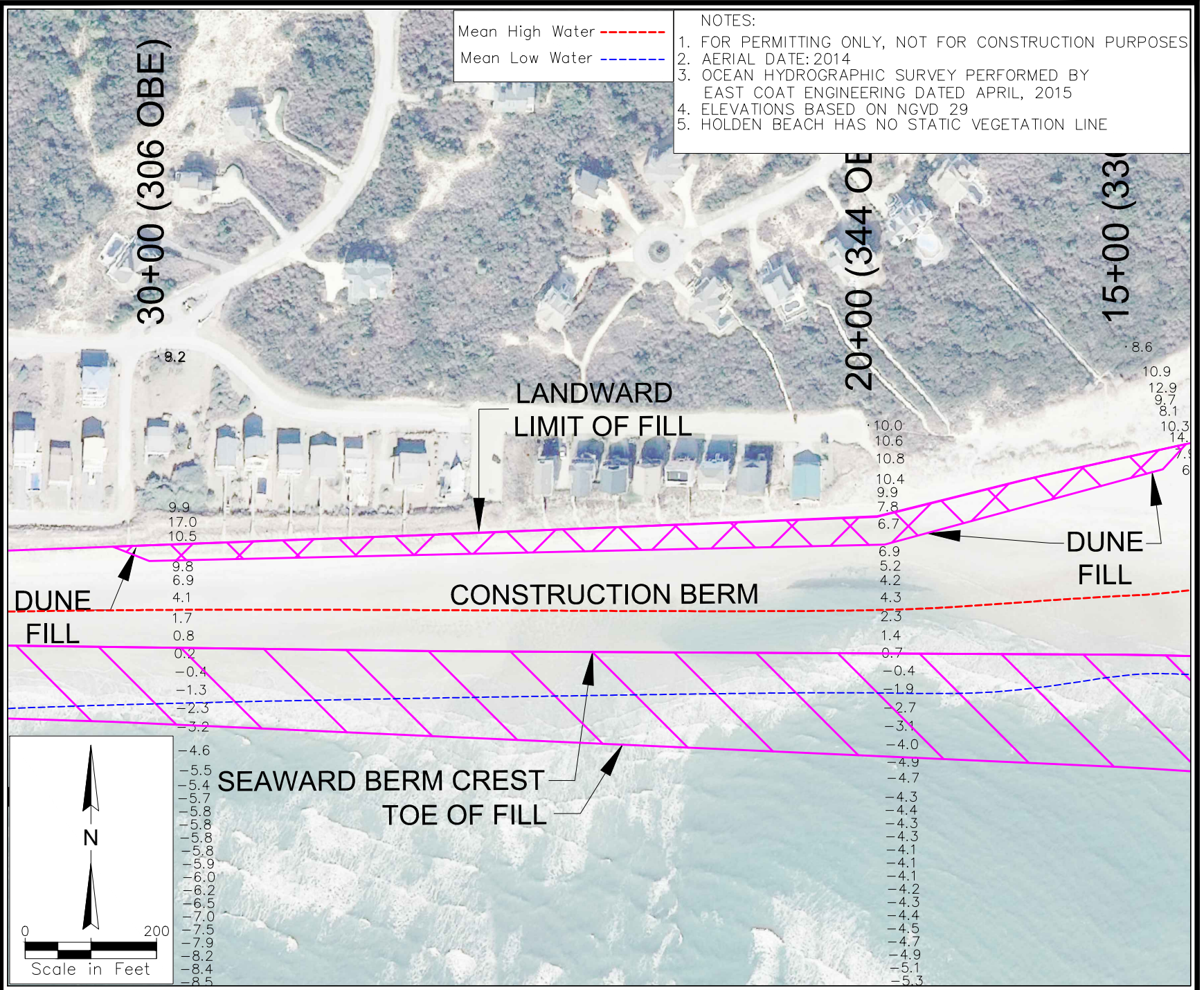
APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHSCHILD STREET
 HOLDEN BEACH, NC 28462



PROPOSED PROJECT
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 08-1687
 ISSUE DATE: 08-11-2015
 SHEET NUMBER: 5

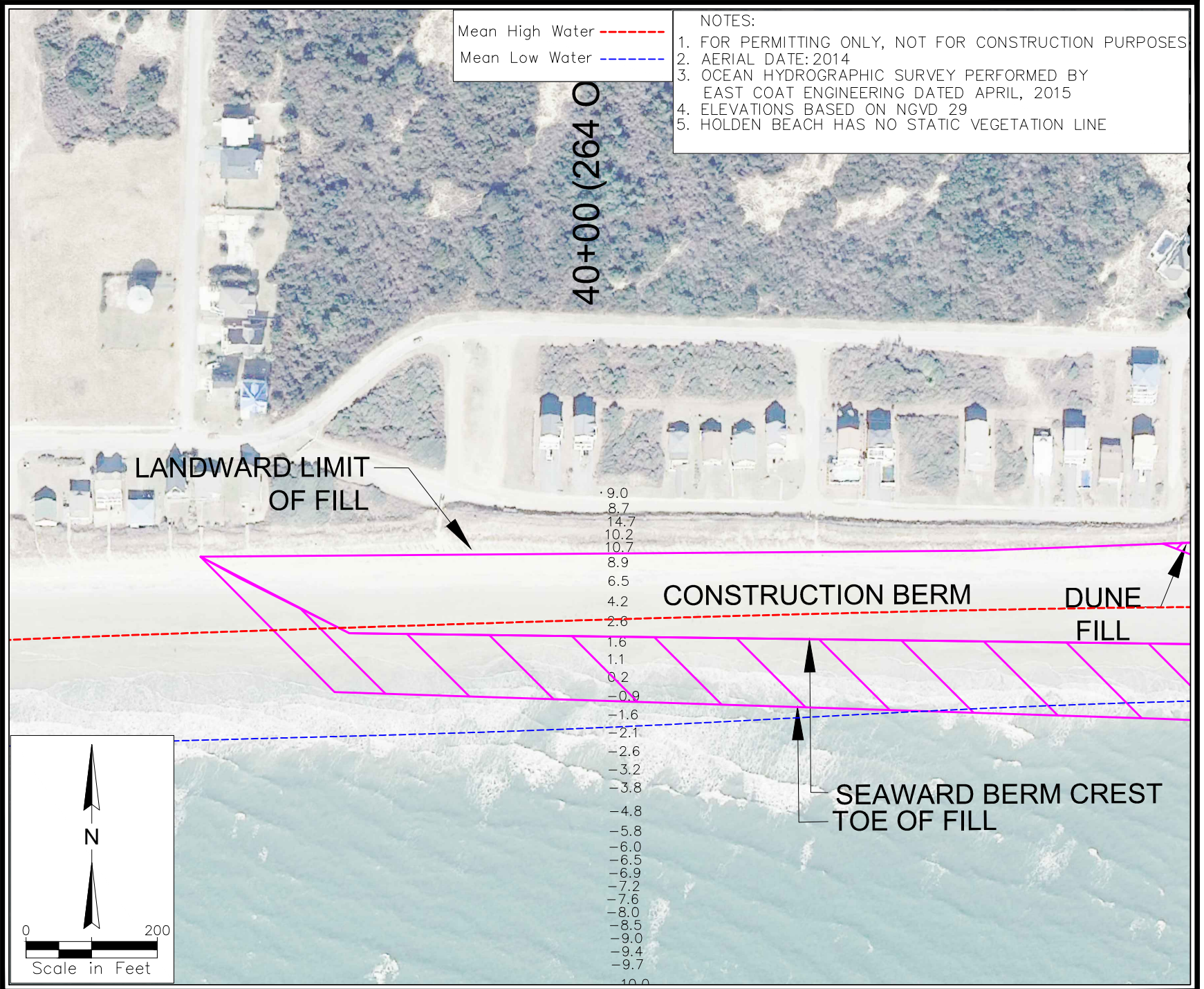
APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHSCHILD STREET
 HOLDEN BEACH, NC 28462



PROPOSED PROJECT
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 08-1687
 ISSUE DATE: 08-11-2015
 SHEET NUMBER: 6

APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHSCHILD STREET
 HOLDEN BEACH, NC 28462



LOCKWOOD FOLLY INLET TIDAL DATUMS

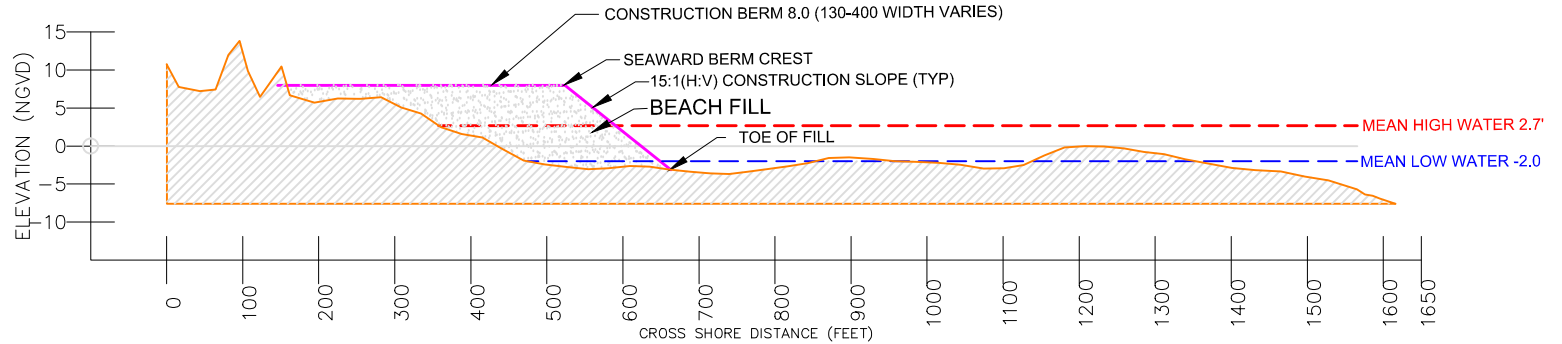
| | | |
|-------|--|-----------------|
| 2.7' | | MEAN HIGH WATER |
| 1.0' | | NAVD 88 |
| 0.5' | | MEAN SEA LEVEL |
| 0.0' | | NGVD 29 |
| -2.0' | | MEAN LOW WATER |

| | |
|--|------------------|
| | FILL |
| | EXISTING SURFACE |

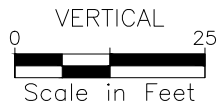
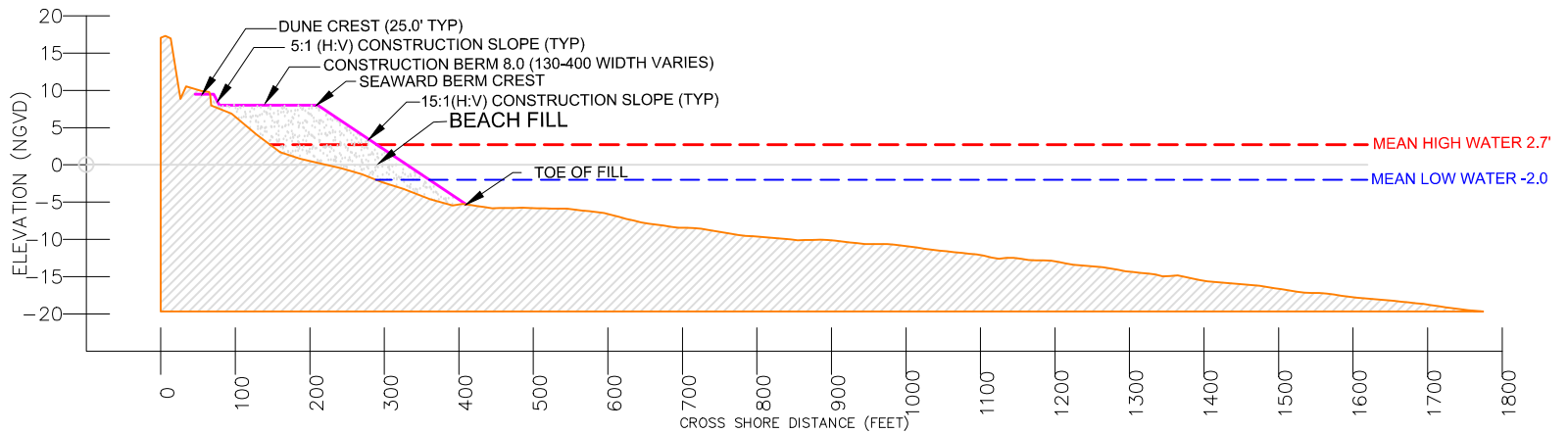
Notes:

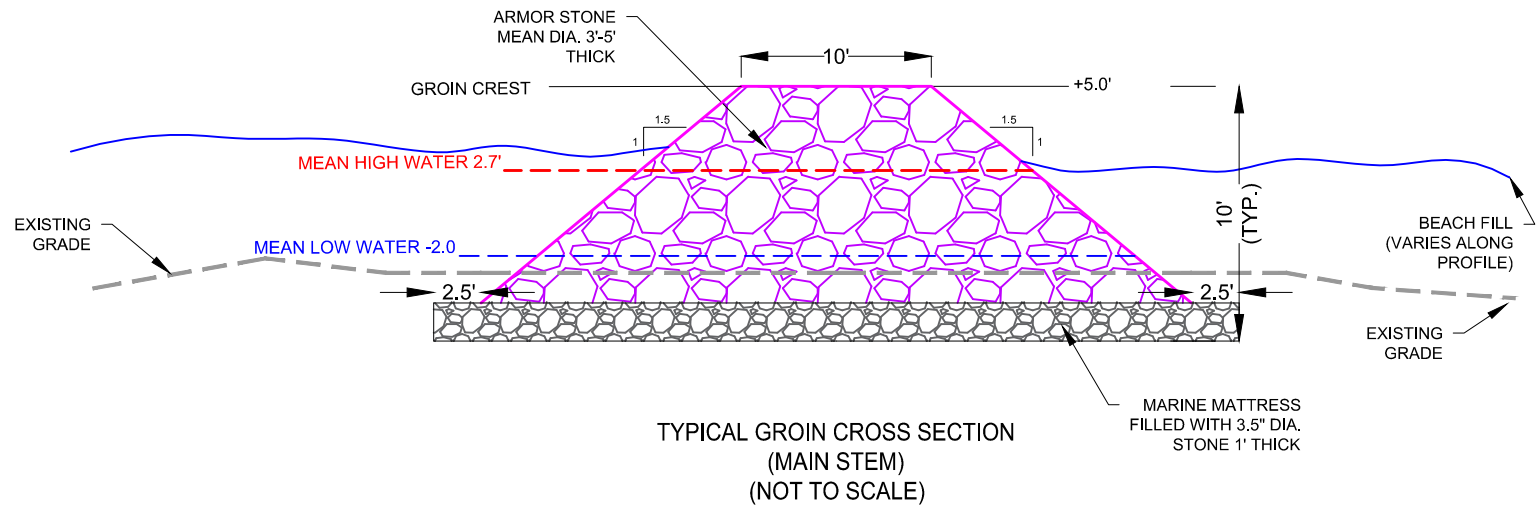
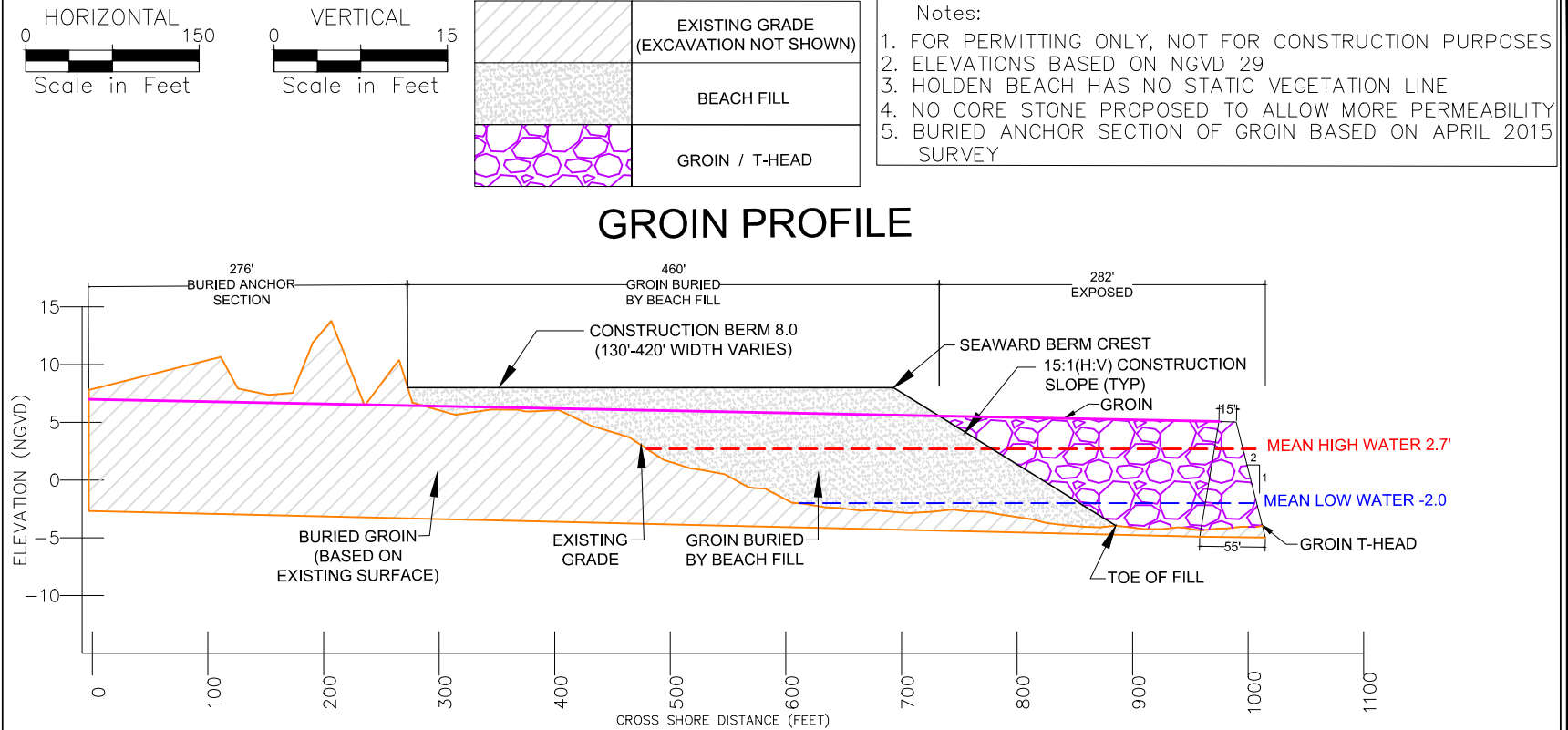
1. FOR PERMITTING ONLY, NOT FOR CONSTRUCTION PURPOSES
2. HYDROGRAPHIC SURVEY PERFORMED BY EAST COAST ENGINEERING DATED APRIL, 2015
3. HORIZONTAL COORDINATES ARE NC GRID (NAD83)
4. ELEVATIONS BASED ON NGVD 29
5. HOLDEN BEACH HAS NO STATIC VEGETATION LINE

STA 10+00 PROFILE



STA 30+00 PROFILE





BORROW AREA
 Holden Beach East End
 Shoreline Stabilization
 Brunswick County, North Carolina

JOB NUMBER: 08-1687
 ISSUE DATE: 08-11-2015
 SHEET NUMBER: 9

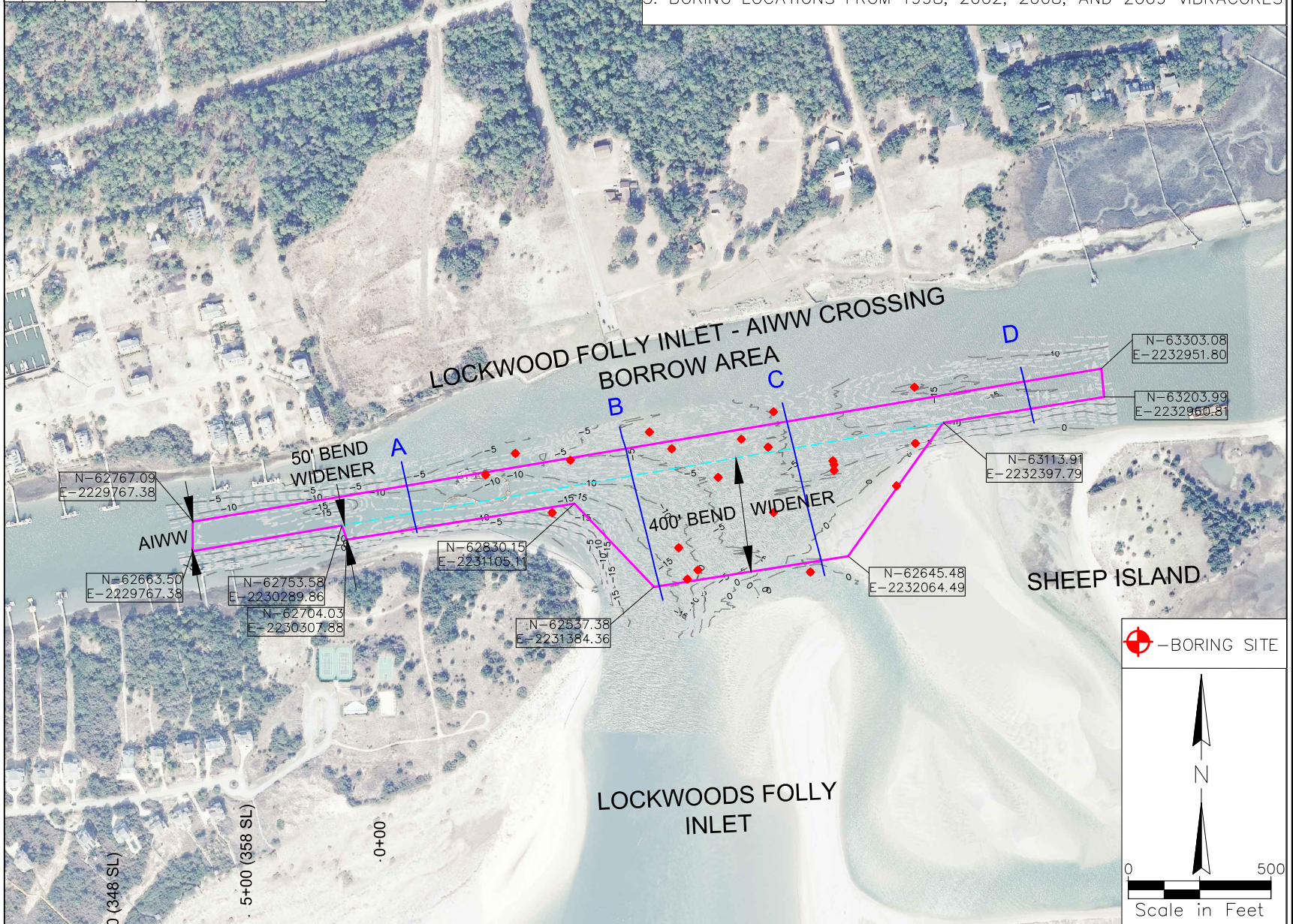
APPLICANT INFORMATION
 TOWN OF HOLDEN BEACH
 110 ROTHCHILD STREET
 HOLDEN BEACH, NC 28462

LOCKWOOD FOLLY INLET TIDAL DATUMS

| | | |
|-------|--|-----------------|
| 2.7' | | MEAN HIGH WATER |
| 1.0' | | NAVD 88 |
| 0.5' | | MEAN SEA LEVEL |
| 0.0' | | NGVD 29 |
| -2.0' | | MEAN LOW WATER |

NOTES:

1. FOR PERMITTING ONLY, NOT FOR CONSTRUCTION PURPOSES
2. AERIAL DATE: 2014
3. HYDROGRAPHIC SURVEY PERFORMED BY USACE DATED NOV 2013 (REPRESENTATIVE OF PRE-PROJECT CONDITIONS)
4. ELEVATIONS BASED ON MLW
5. BORING LOCATIONS FROM 1998, 2002, 2008, AND 2009 VIBRACORES



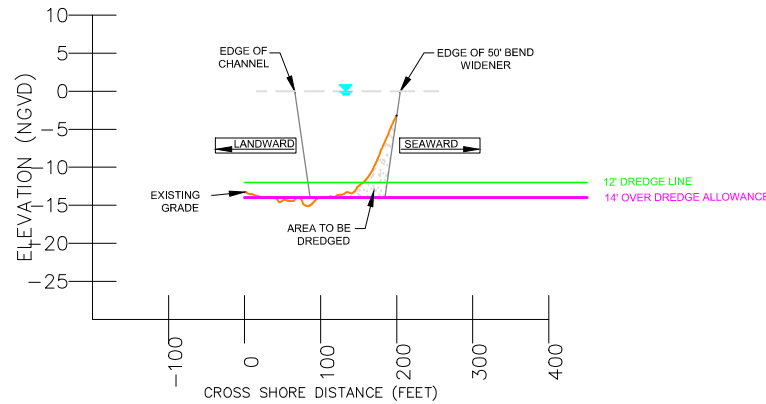
LOCKWOOD FOLLY INLET TIDAL DATUMS

| | | |
|-------|--|-----------------|
| 2.7' | | MEAN HIGH WATER |
| 1.0' | | NAVD 88 |
| 0.5' | | MEAN SEA LEVEL |
| 0.0' | | NGVD 29 |
| -2.0' | | MEAN LOW WATER |

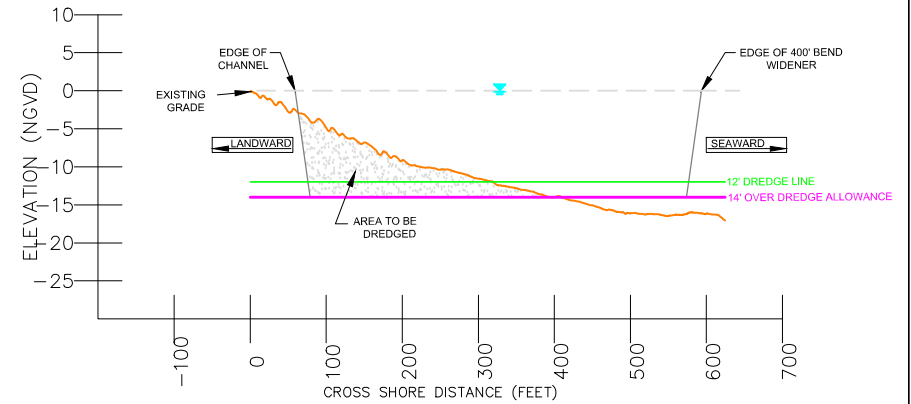
| | |
|--|---------------------|
| | AREAS TO BE DREDGED |
| | EXISTING GRADE |

- NOTES:
1. FOR PERMITTING ONLY, NOT FOR CONSTRUCTION PURPOSES
 2. HYDROGRAPHIC SURVEY PERFORMED BY USACE DATED NOV. 2013 (REPRESENTATIVE OF PRE-PROJECT CONDITIONS)
 3. HORIZONTAL COORDINATES ARE NC GRID (NAD83)
 4. ELEVATIONS BASED ON MLW
 5. HOLDEN BEACH HAS NO STATIC VEGETATION LINE

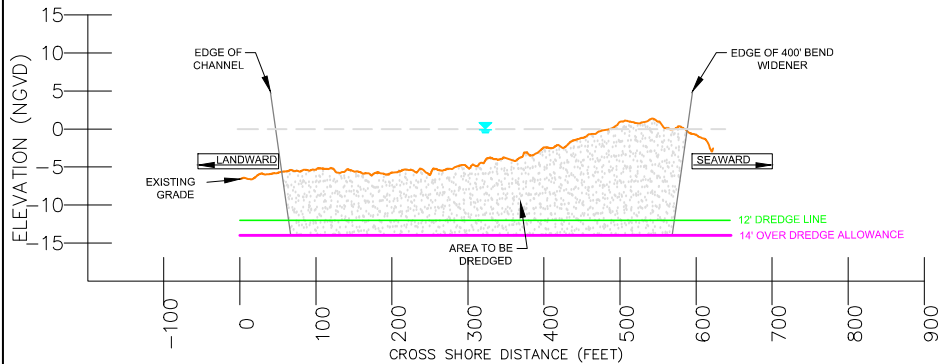
BORROW AREA PROFILE A



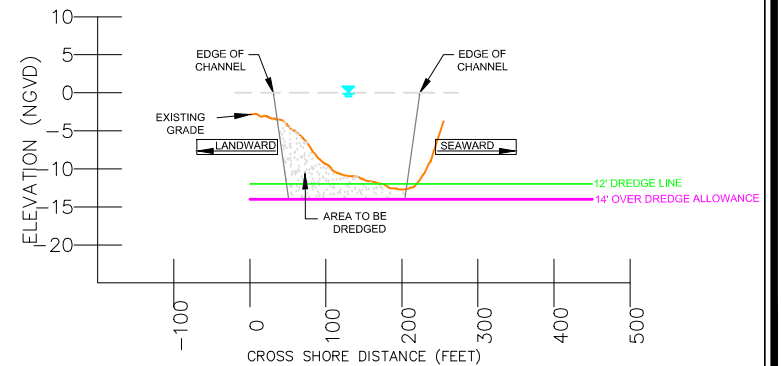
BORROW AREA PROFILE B



BORROW AREA PROFILE C



BORROW AREA PROFILE D



HORIZONTAL
 0 250
 Scale in Feet

VERTICAL
 0 25
 Scale in Feet