CLE Engineering, INC.

ENVIRONMENTAL NOTIFICATION FORM

East Chop Coastal Bank Repairs
Oak Bluffs, MA

Prepared for:
Town of Oak Bluffs
56 School Street
Oak Bluffs, MA
02557

cleengineering
15 Creek Road | Marion, MA 02738
800.668.3220 | www.cleengineering

ENVIRONMENTAL NOTIFICATION FORM
CIRCULATION LIST

East Chop Coastal Bank Repairs
East Chop Drive
Oak Bluffs, MA

Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

DCR
Attn: MEPA Coordinator
251 Causeway Street, Suite 600
Boston, MA 02114

Department of Environmental Protection
Commissioner's Office
One Winter Street
Boston, MA 02108

DEP/Southeast Regional Office
Attn: MEPA Coordinator
20 Riverside Drive
Lakeville, MA 02347

Massachusetts Department of Transportation
Public/Private Development Unit
10 Park Plaza
Boston, MA 02116

Massachusetts Department of Transportation
District #5
Attn: MEPA Coordinator
Box 111
1000 County Street
Taunton, Ma 02780

Massachusetts Historical Commission
The MA Archives Building
220 Morrissey Boulevard
Boston, MA 02125

Planning Board Office
56 School Street
Oak Bluffs, MA 02557

Zoning Board Office
56 School Street
Oak Bluffs, MA 025570

Oak Bluffs Conservation Commission
Town Hall
56 School St.
Oak Bluffs, MA 02557

Board of Health
Town Hall
56 School St.
Oak Bluffs, MA 02557

MA Coastal Zone Management
Attn: Project Review Coordinator
251 Causeway Street, Suite 800
Boston, MA 02114

MA Division of Marine Fisheries
Attn: Environmental Reviewer
1213 Purchase Street- 3rd Floor
New Bedford, Ma 02740-6694

Oak Bluffs Board of Selectmen
Town Hall
56 School St.
Oak Bluffs, MA 02557

Massachusetts Board of Underwater Archaeological Resources
Executive Office of Energy and Environmental Affairs
251 Causeway Street, Suite 800
Boston, MA 02114-2199

U.S. Army Corps of Engineers
New England District, Regulatory Division
696 Virginia Road
Concord, MA 01742

Martha's Vineyard Commission
Attn: Jo-Ann Taylor
P.O. Box 1447
Oak Bluffs, Ma 02557

Cape Cod Commission
3225 Main Street
Barnstable, MA 02630

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: Town of Oak Bluffs East Chop Coastal Bank Repairs

LOCATION: East Chop, Oak Bluffs, MA

PROPONENT: Town of Oak Bluffs

The undersigned is submitting an Environmental Notification Form ("ENF") to the Secretary of Energy & Environmental Affairs on or before June 15, 2017.

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act ("MEPA", M.G.L. c. 30, s.s. 61-62I). Copies of the ENF may be obtained from:

CLE Engineering, Inc.

15 Creek Road, Marion, MA 02738

508-748-0937

Copies of the ENF are also being sent to the Conservation Commission and Planning Board of the Town of Oak Bluffs **where they may be inspected.**

The Secretary of Energy & Environmental Affairs will publish notice of the ENF in the Environmental Monitor, will receive public comments on the project for 20 days, and will then decide, within ten days, if an environmental Impact Report is needed. A site visit and consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit or consultation session, should write to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

By: Town of Oak Bluffs.

Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Policy Act (MEPA) Office

Environmental Notification Form

For Office Use Only

EEA#: _____

MEPA Analyst: _____

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: East Chop Coastal Bank Repairs		
Street Address: East Chop Drive		
Municipality: Oak Bluffs	Watershed: Nantucket Sound	
Universal Transverse Mercator Coordinates:	Latitude:41d27'55.7" Longitude:70d33'37.7"	
Estimated commencement date: Winter 2017	Estimated completion date: Spring 2018	
Project Type: Revetment Repairs/Shoreline Protection	Status of project design: 80 %complete	
Proponent: Town of Oak Bluffs		
Street Address: 56 School Street		
Municipality: Oak Bluffs	State: MA	Zip Code: 02557
Name of Contact Person: Michael Count		
Firm/Agency: CLE Engineering, Inc.	Street Address: 15 Creek Road	
Municipality: Marion	State: MA	Zip Code: 02738
Phone: 508-748-0937	Fax: 508-748-1363	E-mail: MCount@ cleengineering.com

Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)?
☐Yes ☒No

If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:

a Single EIR? (see 301 CMR 11.06(8)) ☐Yes ☐No
a Special Review Procedure? (see 301CMR 11.09) ☐Yes ☐No
a Waiver of mandatory EIR? (see 301 CMR 11.11) ☐Yes ☐No
a Phase I Waiver? (see 301 CMR 11.11) ☐Yes ☐No
(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)

Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)? new fill in velocity zone; alteration of ½ or more acres in any other wetland.

Which State Agency Permits will the project require? MA DEP Chapter 91 License

Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres: TBD

Summary of Project Size & Environmental Impacts	Existing	Change	Total
LAND			
Total site acreage	±6.5 acres		
New acres of land altered		0	
Acres of impervious area	±1.06	±.21	±1.27
Square feet of new bordering vegetated wetlands alteration		0	
Square feet of new other wetland alteration	±28,376 SF	±12,000 SF (revetment);	±40,376 SF
Acres of new non-water dependent use of tidelands or waterways			
STRUCTURES			
Gross square footage	±47,000 SF (revetment)	±30,260 SF (revetment)	±77,650 SF (revetment)
Number of housing units	0	0	0
Maximum height (feet)			
TRANSPORTATION			
Vehicle trips per day	0	0	0
Parking spaces	0	0	0
WASTEWATER			
Water Use (Gallons per day)	0	0	0
Water withdrawal (GPD)	0	0	0
Wastewater generation/treatment (GPD)	0	0	0
Length of water mains (miles)	0	0	0
Length of sewer mains (miles)	0	0	0

Has this project been filed with MEPA before?
☐ Yes (EEA #_____) ☒No

Has any project on this site been filed with MEPA before?
☐ Yes (EEA #_____) ☒No

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION:

Describe the existing conditions and land uses on the project site:

The site is located along the northeastern shoreline of Oak Bluffs adjacent to Nantucket Sound and extends approximately 2,400 linear feet along East Chop Drive in the town of Oak Bluffs, MA. Oak Bluffs is the only town that has roads with uninterrupted public coastal water views from one island boundary to the other, with East Chop linking the two ends together. This shoreline area is protected by a variety of engineered coastline protection features including a stone revetment, a stone jetty, a timber bulkhead, and vegetated coastal bank. These features have historically provided protection to the existing public roadway (East Chop Drive) and adjacent private properties from coastal storms. Repairs and improvements to the bluff over the past century have provided stabilization of the area to the upland; however, over the past decade the engineered coastal bank area has experienced increased erosion that has undermined the paved roadway (East Chop Drive) to the point of imminent failure. Accordingly, the seaward lane of this road has been closed to traffic since 2012 and inspection monitoring events have been ongoing in order to ensure public safety.

The residences located adjacent to East Chop Drive were constructed during the late 1800's and early 1900's, the majority being listed under the state register of historic places. Revenue generated from these properties supports the local economy and East Chop Drive provides access to these residences. The roadway is also a very popular walking, biking, and touring location for locals and visitors throughout the year, offering unique vistas absent from other parts of the island. The road also provides access to the historic East Chop Lighthouse and the most direct emergency access route for emergency response vehicles in this part of Oak Bluffs.

Describe the proposed project and its programmatic and physical elements:

The proposed project will consist of extensive repairs to existing engineered coastal bank area including the existing stone revetment along approximately 2,400 linear feet of East Chop Drive. The project will protect the existing coastal bank and infrastructure located along East Chop Drive and restore/enhance public access areas. The existing stone jetty on the southeast end of the project site will remain. Raising the elevation of the reconstructed revetment above the existing 100 year flood elevation is critical to the long-term viability/protection of the existing coastal bank and public roadway. In order to ensure a long-term repair, the proposed revetment will extend both landward and seaward beyond the existing revetment with an overall revetment footprint increase of 65%, which provides adequate base for raising the existing revetment approximately 8-10' in height, to +20' NGVD29 (5.7' above the 100 year flood elevation). This height has been established to account for wave run-up and 2' of future sea level rise (See Exhibit H). A 1.5H:1V stone revetment slope made up of angular armor stones is proposed, with well-graded fill extending up from the edge of the flat revetment bench at a 27 degree maximum slope, to be planted with salt tolerant vegetation (Beach grass and Rosa Rugosa). The design revetment and upper slope have been designed based on the soil boring investigations performed at the project site and in coordination with geotechnical engineering recommendations provided by JCK Underground for the project site (See Exhibit G). The existing East Chop Drive drainage outfalls will also be re-built, as the drain pipes that discharge into Nantucket Sound have been damaged from the extensive erosion on the coastal bank.

The repair of the engineered coastal bank and revetment is anticipated to impact a total of approximately 6.2 acres of previously altered coastal resource areas. A road shoulder (4' wide) is also proposed as part of this project to offer a safe, convenient, accessible and enjoyable place for pedestrians along the seaward edge of East Chop Drive. A bike rack system and ADA accessible ramp system will be located on the southern end of the project area, which will provide safe access down to the top bench (5' wide) of the proposed revetment. This width will allow pedestrian access to the popular fishing and swimming along the length of the re-built revetment.

No eelgrass beds are located offshore of proposed repair areas based on the most recent 2016 survey data. Construction impacts will be within the footprint of the proposed repairs and will include two (2) construction access routes from East Chop Drive, one on both ends of the repair area. Work will be performed in accordance Time-of-Year (TOY) restrictions established for marine/endangered species and during the island off-season. Traffic flow will remain closed along East Chop Drive until the coastal bank area is stabilized.

NOTE: The project description should summarize both the project's direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements

of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative: **Four alternatives were evaluated for the proposed project: (1) No build. Continued erosion and undermining of the road would occur causing further damage to public infrastructure and compromising shoreline protection to the nearby private residences and does not meet project goals.**
(2) Holding existing revetment toe location and re-build revetment at a 1.5H:1V slope extending up to meet 27 degree vegetated fill. This option would require the proposed revetment top elevation to vary widely and necessitate a considerable increase in armor stone material and associated costs and is therefore not the preferred alternative.
(3) Reinforcement of the coastal bank with a steel sheet pile wall or concrete seawall. This alternative is not consistent with existing shoreline protection methods on the island and would be the most costly alternative. Alternative 3 is not the preferred alternative.
(4) Holding revetment elevation +20' NGVD29 is the 3rd alternative, which minimizes the amount of armor stone required while ensuring long-term stability to the coastal bank area. This alternative meets project goals and is the preferred alternative.

_____

NOTE*: The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.*

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:

- **The majority of the proposed rehabilitation of the coastal bank will occur within existing established footprints.**
- **All work will be conducted within TOY restrictions established for the protection of marine/endangered species.**
- **The proposed site of construction is outside of any shellfish suitability areas and NHESP designated areas.**

If the project is proposed to be constructed in phases, please describe each phase:
The proposed project may be conducted as a single or multi-phased project and sequenced based upon the availability of funds.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:
Is the project within or adjacent to an Area of Critical Environmental Concern?
☐Yes (Specify_____)
☒No
if yes, does the ACEC have an approved Resource Management Plan? ___ Yes ___ No;
If yes, describe how the project complies with this plan.
_____
Will there be stormwater runoff or discharge to the designated ACEC? ___ Yes ___ No;
If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC.
_____

RARE SPECIES:
Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/priority_habitat/priority_habitat_home.htm)
☐Yes (Specify_____) ☒No

HISTORICAL /ARCHAEOLOGICAL RESOURCES:
Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?
☐Yes (Specify_____) ☒No

The proposed repairs are adjacent to residences listed on the State Register.

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? ☐Yes (Specify_____) ☒No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? ___Yes __**X**_No; if yes, identify the ORW and its location. _____

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Are there any impaired water bodies on or within a half-mile radius of the project site? ___Yes ___No; if yes, identify the water body and pollutant(s) causing the impairment:_____.

Is the project within a medium or high stress basin, as established by the Massachusetts Water Resources Commission? ___Yes ___No

STORMWATER MANAGEMENT:

Generally describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations:
An increase in impervious area above the FEMA flood zone at the project site will occur due to the proposed 4' wide asphalt shoulder adjacent to East Chop Drive. The total area will total approximately 1/3 acres. During construction, erosion control measures will be implemented to aid in preventing siltation into Nantucket Sound. The proposed project is a redevelopment project and is therefore required to meet Stormwater Regulations "to the maximum extent practicable".

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? site (including Release Tracking Number (RTN), cleanup phase, and Response Action Outcome classification):_____

Is there an Activity and Use Limitation (AUL) on any portion of the project site? Yes ___ No _X__; if yes, describe which portion of the site and how the project will be consistent with the AUL: _____.

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN? Yes ___ No ___ ; if yes, please describe:_____

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood:_____

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

Will your project disturb asbestos containing materials? Yes ___ No __X_ ; if yes, please consult state asbestos requirements at http://mass.gov/MassDEP/air/asbhom01.htm

Describe anti-idling and other measures to limit emissions from construction equipment: _____

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River? Yes ___ No _X__ ; if yes, specify name of river and designation:

If yes, does the project have the potential to impact any of the “outstandingly remarkable” resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River?
Yes ___ No ___ ; if yes, specify name of river and designation: _____;
if yes, will the project will result in any impacts to any of the designated “outstandingly remarkable” resources of the Wild and Scenic River or the stated purposes of a Scenic River.
Yes ___ No ___ ;
if yes,describe the potential impacts to one or more of the “outstandingly remarkable” resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. List of all attachments to this document.
2. U.S.G.S. map (good quality color copy, 8-½ x 11 inches or larger, at a scale of 1:24,000) indicating the project location and boundaries.
3.. Plan, at an appropriate scale, of existing conditions on the project site and its immediate environs, showing all known structures, roadways and parking lots, railroad rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.
4 Plan, at an appropriate scale, depicting environmental constraints on or adjacent to the project site such as Priority and/or Estimated Habitat of state-listed rare species, Areas of Critical Environmental Concern, Chapter 91 jurisdictional areas, Article 97 lands, wetland resource area delineations, water supply protection areas, and historic resources and/or districts.
5. Plan, at an appropriate scale, of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing conditions upon the completion of each phase).
6. List of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).
7. List of municipal and federal permits and reviews required by the project, as applicable.

<u>LAND SECTION</u> – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to **land** (see 301 CMR 11.03(1)
___ Yes __X_ No; if yes, specify each threshold:

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	Existing	Change	Total
Footprint of buildings	_____	_____	_____
Internal roadways	_____	_____	_____
Parking and other paved areas	_____	_____	_____
Other altered areas	_____	_____	_____
Undeveloped areas	_____	_____	_____
Total: Project Site Acreage	_____	_____	_____

B. Has any part of the project site been in active agricultural use in the last five years?
___ Yes __X_ No; if yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?

C. Is any part of the project site currently or proposed to be in active forestry use?
___ Yes __X_ No; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:

D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? ___ Yes __X_ No; if yes, describe:

E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? ___ Yes__X_ No; if yes, does the project involve the release or modification of such restriction? ___ Yes ___ No; if yes, describe:

F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? ___ Yes __X_ No; if yes, describe:

G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? Yes ___ No _X__; if yes, describe:

III. Consistency

A. Identify the current municipal comprehensive land use plan
Title: _**Oak Bluffs Master Plan**___ Date____**1998**_____

B. Describe the project's consistency with that plan with regard to:

1) economic development _**restored/enhanced shoreline will preserve local shoreline and historic residences, and will support local travel/tourism, recreation, and emergency access routes. Directly to the North of the project site, the historic East Chop lighthouse sits on top of the bluff on a parcel of park land; the lighthouse and grounds are also a major seasonal resident, vacationer, and tourist attraction.**

2) adequacy of infrastructure **Existing coastal infrastructure will be rehabilitated.**

3) open space impacts _**Restored/enhanced public shoreline and fishing locations are**

compatible with open space goals. Protection of one of the most scenic roads on the Island, that is enjoyed extensively by walkers, runners, bikers, and drivers. The road is a critical piece of the scenic shoreline roadway system in Oak Bluffs that runs all the way along the Town coastline from one town border (Tisbury) to the other (Edgartown).
4) compatibility with adjacent land uses_**The proposed project will preserve the adjacent residential properties and restore the roadway adjacent to the coastal bank.**

C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)
RPA: __**Marthas Vineyard Commission**_____

Title:__**The Island Plan** _____ Date_____**2009**_____

D. Describe the project's consistency with that plan with regard to:
1) economic development _**restored/enhanced shoreline will preserve local shoreline and historic residences, and will support local travel/tourism, recreation, and emergency access routes**. **Directly to the North of the project site, the historic East Chop lighthouse sits on top of the bluff on a parcel of park land; the lighthouse and grounds are also a major seasonal resident, vacationer, and tourist attraction.**
2) adequacy of infrastructure **Existing coastal infrastructure will be rehabilitated.** _____
3) open space impacts __**Restored/enhanced public shoreline and fishing locations are compatible with open space goals. Protection of one of the most scenic roads on the Island, that is enjoyed extensively by walkers, runners, bikers, and drivers. The road is a critical piece of the scenic shoreline roadway system in Oak Bluffs that runs all the way along the Town coastline from one town border (Tisbury) to the other (Edgartown).**
4) compatibility with adjacent land uses_**The proposed project will preserve the adjacent residential properties and restore the roadway adjacent to the coastal bank.**

RARE SPECIES SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **rare species or habitat** (see 301 CMR 11.03(2))? ___ Yes __X_ No; if yes, specify, in quantitative terms:

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

B. Does the project require any state permits related to **rare species or habitat**? ___ Yes ___ No

C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes ___ No.

D. If you answered "No" to all questions A, B and C, proceed to the **Wetlands, Waterways, and Tidelands Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes _X__ No. If yes,

1. Have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? ___Yes ___No; if yes, have you received a determination as to whether the project will result in the "take" of a rare species? ___ Yes ___ No; if yes, attach the letter of determination to this submission.

2. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate rare species impacts

3. Which rare species are known to occur within the Priority or Estimated Habitat?

4. Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? ___ Yes ___ No

4. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes ___ No; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? ___ Yes ___ No

B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes _X__ No; if yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wetlands, waterways, and tidelands** (see 301 CMR 11.03(3))? _X__ Yes ___ No; if yes, specify, in quantitative terms: **Rehabilitation of existing coastal structures within a velocity zone.**

B. Does the project require any state permits (or a local Order of Conditions) related to **wetlands, waterways, or tidelands**? __X_ Yes ___ No; if yes, specify which permit: **Local Order of Conditions, DEP Chapter 91 License.**

C. If you answered "No" to both questions A and B, proceed to the **Water Supply Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? _X__ Yes ___ No; if yes, has a Notice of Intent been filed? ___ Yes X No; if yes, list the date and MassDEP file number: _____; if yes, has a local Order of Conditions been issued? ___ Yes ___ No; Was the Order of Conditions appealed? ___ Yes ___ No. Will the project require a Variance from the Wetlands regulations? ___ Yes ___ No.

B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site: Wetland resource areas permanently and/or temporarily impacted by the project include coastal beach and land under the ocean. Detailed areas are provided under Item C. below

C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

Coastal Wetlands	Area (square feet) or Length (linear feet)	Temporary or Permanent Impact?
Land Under the Ocean	____34,500 SF_____	_____Permanent_____
Designated Port Areas	_____	_____
Coastal Beaches	____14,004 SF____	_____ Permanent __
Coastal Dunes	_____	_____
Barrier Beaches	_____	_____
Coastal Banks	___200,000 SF___	_____ Permanent ___
Rocky Intertidal Shores	_____	_____
Salt Marshes	_____	_____
Land Under Salt Ponds	_____	_____
Land Containing Shellfish	_____	_____
Fish Runs	_____	_____
Land Subject to Coastal Storm Flowage	____30,000 SF____	_____ Permanent ____
Inland Wetlands		
Bank (lf)	_____	_____
Bordering Vegetated Wetlands	_____	_____
Isolated Vegetated Wetlands	_____	_____
Land under Water	_____	_____
Isolated Land Subject to Flooding	_____	_____
Borderi ng Land Subject to Flooding	_____	_____
Riverfront Area	_____	_____

D. Is any part of the project:

1. proposed as a **limited project**? ___ Yes __X_ No; if yes, what is the area (in sf)?____
2. the construction or alteration of a **dam**? ___ Yes _X__ No; if yes, describe:
3. fill or structure in a **velocity zone** or **regulatory floodway**? __X_ Yes ___ No
4. dredging or disposal of dredged material? ___ Yes _X__ No; if yes, describe the volume of dredged material and the proposed disposal site:
5. a discharge to an **Outstanding Resource Water (ORW)** or an **Area of Critical Environmental Concern (ACEC)**? ___ Yes _X__ No
6. subject to a wetlands restriction order? ___ Yes _X_ No; if yes, identify the area (in sf):
7. located in buffer zones? __X_Yes ___No; if yes, how much (in sf) **___±203,150___**

E. Will the project:
1. be subject to a local wetlands ordinance or bylaw? __X_ Yes ___ No
2. alter any federally-protected wetlands not regulated under state law? ___ Yes __X_ No; if yes, what is the area (sf)?

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? _X__ Yes ___ No; if yes, is there a current Chapter 91 license or permit affecting the project site? __X_ Yes ___ No; if yes, list the date and license or permit number and provide a copy of the historic map used to determine extent of filled tidelands:

MA DPW DIV. OF WATERWAYS CONTRACT NO.	DATE	LENGTH OF WORK (L.F.)	TYPE OF WORK
N/A	1890/1898	±1,210	REVETMENT CONSTRUCTION
2554	1966	±600	REVETMENT AND SLOPE IMPROVEMENTS
2130	1960	±200	REVETMENT AND SLOPE IMPROVEMENTS
1592	1956	±325	REVETMENT AND STONE SLOPE IMPROVEMENTS
1429	1954	±350	REVETMENT AND STONE SLOPE IMPROVEMENTS
1338	1953	±400	REVETMENT AND STONE SLOPE IMPROVEMENTS
1244	1952	±1,150	REVETMENT CONSTRUCTION
N/A	1949	130	GROIN CONSTRUCTION
1015	1947	±300	REVETMENT AND SLOPE REPAIRS
817	1945	±200	TIMBER BULKHEAD REPAIRS
472	1936	±1,475	REVETMENT AND SLOPE REPAIRS
N/A	1929	±2,088	TIMBER BULKHEAD CONSTRUCTION

B. Does the project require a new or modified license or permit under M.G.L.c.91? _X__ Yes ___ No; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use? Current ___ Change ___ Total _0__

If yes, how many square feet of solid fill or pile-supported structures (in sf)?

Proposed Revetment and Fill Area = ±235,000 SF

C. For non-water-dependent use projects, indicate the following:

Area of filled tidelands on the site:_____

Area of filled tidelands covered by buildings:_____

For portions of site on filled tidelands, list ground floor uses and area of each use: _____

Does the project include new non-water-dependent uses located over flowed tidelands? Yes ___ No ___

Height of building on filled tidelands_____

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.

D. Is the project located on landlocked tidelands? ___ Yes _X_ No; if yes, describe the project's impact on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

E. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? ___Yes _X_ No; if yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

F. Is the project non-water-dependent **and** located on landlocked tidelands **or** waterways or tidelands subject to the Waterways Act **and** subject to a mandatory EIR? ___ Yes _XNo; *(NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)*

G. Does the project include dredging? ___ Yes __X_ No; if yes, answer the following questions:

What type of dredging? Improvement ___ Maintenance ___ Both ____

What is the proposed dredge volume, in cubic yards (cys) _____

What is the proposed dredge footprint ____length (ft) ___width (ft)____depth (ft);

Will dredging impact the following resource areas?

Intertidal Yes__ No__; if yes, ___ sq ft

Outstanding Resource Waters Yes__ No__; if yes, ___ sq ft

Other resource area (i.e. shellfish beds, eel grass beds) Yes__ No__; if yes __ sq ft

If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?

If no to any of the above, what information or documentation was used to support this determination?

Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.

Sediment Characterization

Existing gradation analysis results? __Yes ___No: if yes, provide results.

Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___Yes ____No; if yes, provide results.

Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? If yes, check the appropriate option.

Beach Nourishment ___

Unconfined Ocean Disposal ___

Confined Disposal:
Confined Aquatic Disposal (CAD) ___
Confined Disposal Facility (CDF) ___
Landfill Reuse in accordance with COMM-97-001 ___
Shoreline Placement ___
Upland Material Reuse____
In-State landfill disposal____
Out-of-state landfill disposal ____
(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:

A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? __X_ Yes ___ No; if yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:

HABITAT POLICY #1: *Protect wetland areas including salt marshes, shellfish beds, dunes, beaches, barrier beaches, salt ponds, eel grass beds, and freshwater wetlands for their role as natural habitats.* The proposed project will aid in the protection of wetland resource areas by introducing a much needed rehabilitation of the existing engineered shoreline protection and will prevent future erosion in the overall shoreline system. The re-built revetment and vegetated fill area will help protect existing coastal beach and coastal bank areas.

HABITAT POLICY #2: *Promote the restoration of degraded and former wetland resources in coastal areas and ensure activities in coastal areas do not further wetland degradation but instead take advantage of opportunities to engage in wetland restoration.* The proposed project will promote the restoration of the degraded shoreline through introducing a much needed rehabilitation of the existing engineered shoreline protection to the overall shoreline system. The proposed stabilization measures will restore the eroding coastal bank area.

COASTAL HAZARD POLICY #1: *Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.* The proposed project will provide storm damage protection and flood control by repairing the existing engineered coastal bank and shoreline. Placement of revetment stone and vegetated fill will provide protection to the existing coastal bank, public roadway and historic residences located along East Chop Drive. It is anticipated that the proposed project will beneficially affect the resource areas' ability to perform their intended functions.

COASTAL HAZARD POLICY #2: *Ensure construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport*. Construction of the proposed project is not anticipated to interfere with water circulation. Revetment stone that is placed along the shoreline and placed below MLW is anticipated to cause temporary turbidity which will fall out of the water column fairly rapidly due to its grain size and therefore sediment transport is expected to be minimal.

PUBLIC ACCESS MANAGEMENT PRINCIPLE #2: *Increase capacity of existing recreation areas by facilitating multiple use and improving management, maintenance, and public support facilities.* This project will result in restored public use of the roadway and will also provide an ADA accessible walkway extending from East Chop Drive down to the proposed revetment top for access to site seeing, fishing, and swimming.

GROWTH MANAGEMENT PRINCIPLE #1: *Encourage, through technical assistance and review of publicly funded development, compatibility of proposed development with local community character and scenic resources.* Implementation of the proposed project will restore/enhance the local community character and scenic resources along East Chop shoreline. Since the early 1900s, the project area has been and presently continues to be a major tourist destination during the summer months, with the local economy depending upon the accessible roadway infrastructure. The project is consistent with the goals/objectives of the Town's municipal land use plan and the current regional policy plan (2009 Island Plan, Martha's Vineyard Commission) in that it supports economic development, addresses adequacy of coastal infrastructure, open space and compatibility with adjacent land uses.

B. Is the project located within an area subject to a Municipal Harbor Plan? ___ Yes __X_ No; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **water supply** (see 301 CMR 11.03(4))? ___ Yes __X_ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **water supply**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Wastewater Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	Existing	Change	Total
Municipal or regional water supply	_____	_____	_____
Withdrawal from groundwater	_____	_____	_____
Withdrawal from surface water	_____	_____	_____
Interbasin transfer	_____	_____	_____

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes ___ No; if yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. _____

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? _____Will the project require an increase in that withdrawal? ___Yes ___No; if yes, then how much of an increase (gpd)? _____

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? ___ Yes ___No. If yes, describe existing and proposed water supply facilities at the project site:

	Permitted Flow	Existing Avg Daily Flow	Project Flow	Total
Capacity of water supply well(s) (gpd)	_____	_____	_____	_____
Capacity of water treatment plant (gpd)	_____	_____	_____	_____

F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

G. Does the project involve:

1. new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district? ___ Yes ___ No
2. a Watershed Protection Act variance? ___ Yes ___ No; if yes, how many acres of alteration?
3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking

water supply for purpose of forest harvesting activities? ___ Yes ___ No

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wastewater** (see 301 CMR 11.03(5))? ___ Yes _X__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **wastewater**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	Existing	Change	Total
Discharge of sanitary wastewater	_____	_____	_____
Discharge of industrial wastewater	_____	_____	_____
TOTAL	_____	_____	_____

	Existing	Change	Total
Discharge to groundwater	_____	_____	_____
Discharge to outstanding resource water	_____	_____	_____
Discharge to surface water	_____	_____	_____
Discharge to municipal or regional wastewater facility	_____	_____	_____
TOTAL	_____	_____	_____

B. Is the existing collection system at or near its capacity? ___ Yes ___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

C. Is the existing wastewater disposal facility at or near its permitted capacity? ___ Yes___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes ___ No; if yes, describe as follows:

	Permitted	Existing Avg Daily Flow	Project Flow	Total
Wastewater treatment plant capacity (in gallons per day)	_____	_____	_____	_____

E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new?

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ___ Yes ___ No

G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ___ Yes ___ No; if yes, what is the capacity (tons per day):

	Existing	Change	Total
Storage	_____	_____	_____
Treatment	_____	_____	_____
Processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

III. Consistency

A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___ Yes ___ No; if yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan:

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

A. Will the project meet or exceed any review thresholds related to **traffic generation** (see 301 CMR 11.03(6))? ___ Yes __X_ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **state-controlled roadways**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	Existing	Change	Total
Number of parking spaces	_____	_____	_____
Number of vehicle trips per day	_____	_____	_____
ITE Land Use Code(s):	_____	_____	_____

B. What is the estimated average daily traffic on roadways serving the site?

Roadway	Existing	Change	Total
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____

C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement:

D. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

C. Is there a Transportation Management Association (TMA) that provides transportation demand management (TDM) services in the area of the project site? ____ Yes ____ No; if yes, describe if and how will the project will participate in the TMA:

D. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? ____ Yes ____ No; if yes, generally describe:

E. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title 14 Part 77.13, forms 7460-1 and 7460-2)?

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? ___ Yes __X_ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **roadways or other transportation facilities**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

B. Will the project involve any

1. Alteration of bank or terrain (in linear feet)? _____
2. Cutting of living public shade trees (number)? _____
3. Elimination of stone wall (in linear feet)? _____

III. Consistency -- Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **energy** (see 301 CMR 11.03(7))? ___ Yes _X__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **energy**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	Existing	Change	Total
Capacity of electric generating facility (megawatts)	_____	_____	_____
Length of fuel line (in miles)	_____	_____	_____
Length of transmission lines (in miles)	_____	_____	_____
Capacity of transmission lines (in kilovolts)	_____	_____	_____

B. If the project involves construction or expansion of an electric generating facility, what are:

1. the facility's current and proposed fuel source(s)?
2. the facility's current and proposed cooling source(s)?

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___Yes ___No; if yes, please describe:

D. Describe the project's other impacts on energy facilities and services:

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ___ Yes __X_ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **air quality**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Solid and Hazardous Waste Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___ Yes ___ No; if yes, describe existing and proposed emissions (in tons per day) of:

	Existing	Change	Total
Particulate matter	_____	_____	_____
Carbon monoxide	_____	_____	_____
Sulfur dioxide	_____	_____	_____
Volatile organic compounds	_____	_____	_____
Oxides of nitrogen	_____	_____	_____
Lead	_____	_____	_____
Any hazardous air pollutant	_____	_____	_____
Carbon dioxide	_____	_____	_____

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ___ Yes __X_ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **solid and hazardous waste**? ___ Yes ___ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	Existing	Change	Total
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	Existing	Change	Total
Storage	_____	_____	_____
Recycling	_____	_____	_____
Treatment	_____	_____	_____
Disposal	_____	_____	_____

C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos? ___ Yes ___ No

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Have you consulted with the Massachusetts Historical Commission? ___ Yes _X__ No; if yes, attach correspondence. For project sites involving lands under water, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? ____Yes __X__ No; if yes, attach correspondence

B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes __X_ No; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___ Yes __X_ No; if yes, please describe:

C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes __X_ No; if yes, does the project involve the destruction of all or any part of such archaeological site? ___ Yes ___ No; if yes, please describe:

D. If you answered "No" to <u>all parts of both</u> questions A, B and C, proceed to the **Attachments and Certifications** Sections. If you answered "Yes" to <u>any part of either</u> question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

CERTIFICATIONS:

1. The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

   (Name) Marthas Vineyard Times (Date) TBD

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

Signatures:

	5-26-17		
Date	Signature of Responsible Officer or Proponent	Date	Signature of person preparing ENF (if different from above)

	Michael Count
Name (print or type)	Name (print or type)
Town of Oak Bluffs	CLE Engineering, Inc.
Firm/Agency	Firm/Agency
56 School Street	15 Creek Road
Street	Street
Oak Bluffs, MA 02557	Marion, MA 02738
Municipality/State/Zip	Municipality/State/Zip
(508) 693-3554	(508) 748-0937
Phone	Phone

Table of Attachments

Exhibit A Locus Map

Exhibit B Project Plans

Exhibit C FEMA Map

Exhibit D Soil Boring Logs

Exhibit E Historic Engineered Bank Repair Plan

Exhibit F State Register of Historic Places (MACRIS Results)

Exhibit G Geotechnical Design Report (by JCK Underground)

Exhibit H Wave Run-up Analysis Calculations

Exhibit I Site Photographs

EXHIBIT A

Locus Map

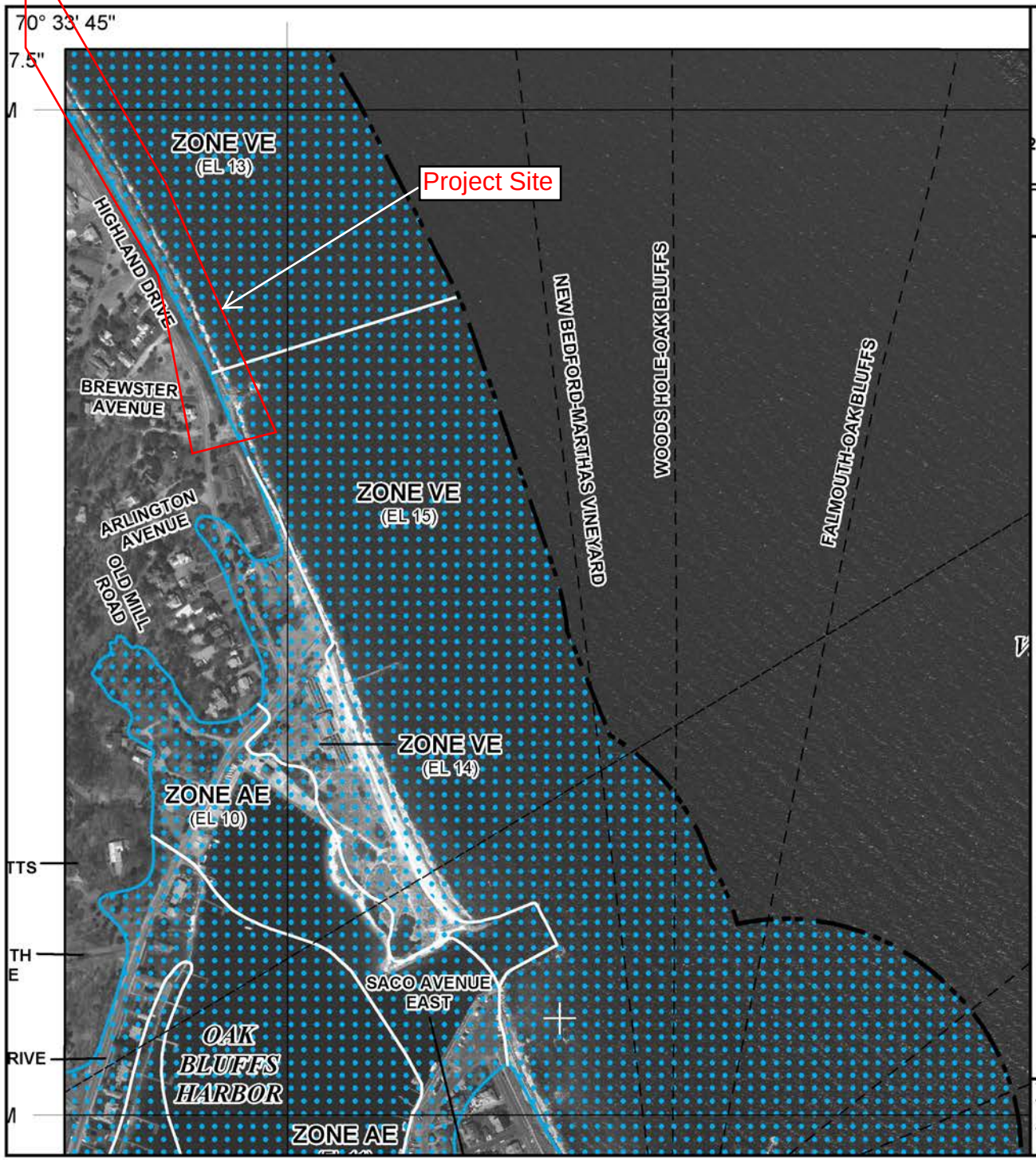
SITE LOCATION MAP	*U.S.G.S. QUADRANGLE: OAK BLUFFS, MA* *APPROX. SCALE: 1:1,000*	cleengineering
LOCATION OAK BLUFFS, MASSACHUSETTS		15 Creek Road | Marion, Massachusetts 02738 t: 508.748.0937 | www.cleengineering.com
CLIENT TOWN OF OAK BLUFFS		

EXHIBIT B

Project Plans
Prepared by CLE Engineering, Inc.
Dated May 25, 2017 (4 Sheets)

EXHIBIT C

Fema Map



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0108J

FIRM

FLOOD INSURANCE RATE MAP

DUKES COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 108 OF 227

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OAK BLUFFS, TOWN OF	250072	0108	J

-NOTE-

THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

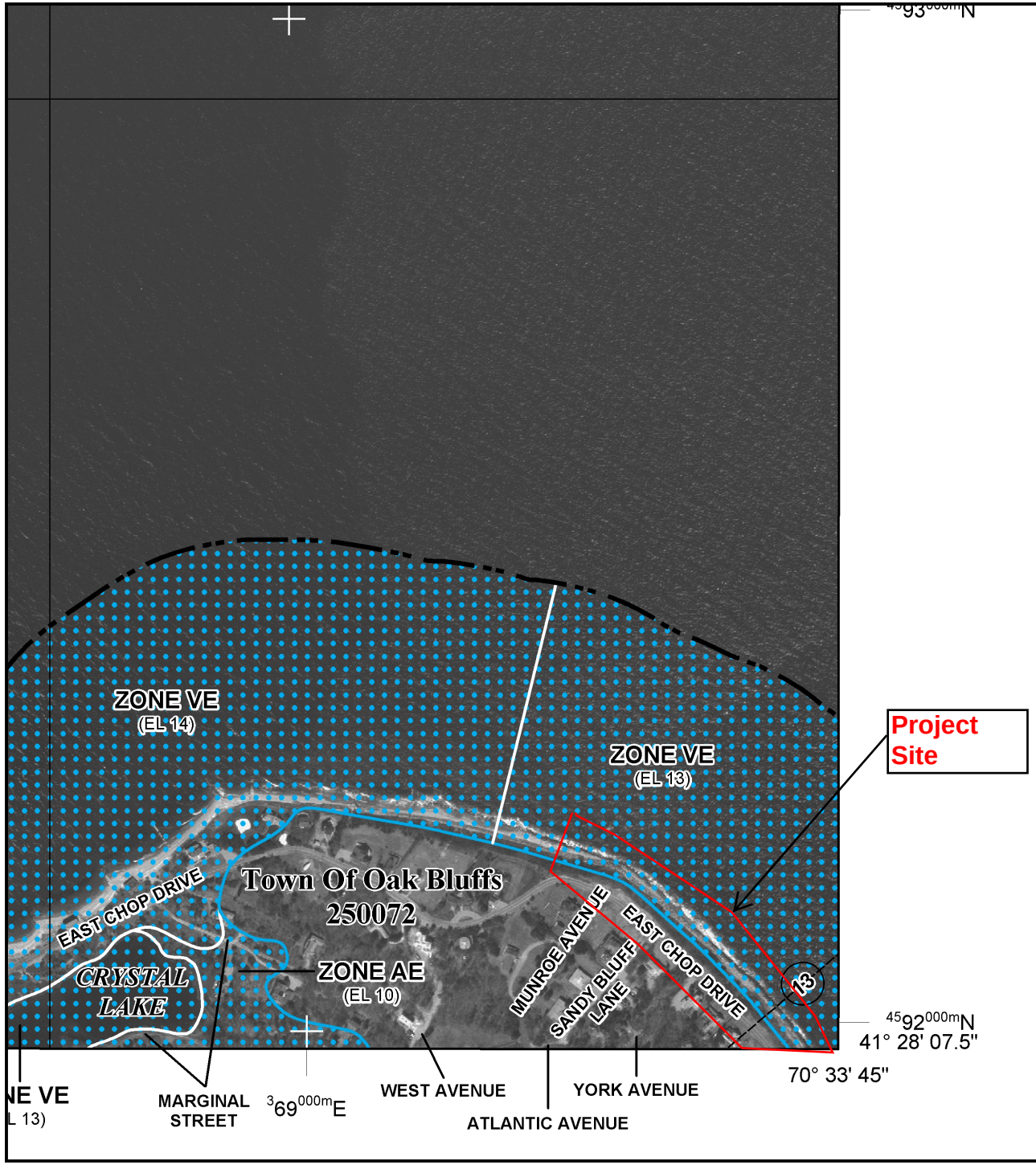
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25007C0108J

MAP REVISED
JULY 20, 2016

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0102J

FIRM

FLOOD INSURANCE RATE MAP

DUKES COUNTY, MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 102 OF 227

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OAK BLUFFS, TOWN OF	250072	0102	J
TISBURY, TOWN OF	250073	0102	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25007C0102J

MAP REVISED
JULY 20, 2016

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

EXHIBIT D

Boring Logs

DEERE & AULT CONSULTANTS, INC.

		Boring	SPT-1 STA 2+50
		Page	1 of 1
		Date	Monday, September 08, 2008
		Weather	60-70's, Sunny
Groundwater Depth	* feet	Project Name	East Chop Bluff
Total Depth of Hole	61 feet	Job No	D&A 0193.021.00, CLE 08.057.100, Dig Safe 2009-360-2447 (9/5/08)
Depth to Rock	N.E. feet	Driller	Geologic, Scott Canning (508) 384-4434, Dave Sheldon (drill foremen) & Taylor
N.E. = not encountered		Logged By	Joel Q. Kantola (978) 886 4550

Elev. feet	Depth feet	Sample Type & No.	Blows per 6"	RQD or Blow Count	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions 7:00-7:30: setup on hole. 7:30-11:10: advance hole to 61'. 11:10- : Clean up and move to hole SPT-3.
								8" asphalt.
	1-3	S1	13	35	24	8		Sand, fine grain, trace gravel, trace fines, wet from drill water, brown, SP.
			21					
			14					
			12					
	4-6	S1	17	28	24	4		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet*, brown, SP..
			12					*wet from drilling.
			16					
			16					Drilling 6-9': fine to meidum grain sand.
	9-11	S1	45b	105	24	6		Sand, fine to medium grain, trace gravel, trace fines, wet*, brown, SP.
			38					Note: wash material at top. Start mixing mud for drilling.
			67					45b = spoon bouncing for almost all 45 blows.
			68					Drilling 11-14': fine to coarse fragment, with occassional grinding noises.
	14-16	S1	22	43	24	8		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, moist, brown, SP.
			22					
			21					Drilliing 16-19': fine to coarse sand with rock fragments occassionally, occassional grinding indicative
			22					of thin layers of gravel.
	19-21	S1	20	59	21	6		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet, brown, SP.
			23					50b/3": spoon bounced for last 20 blows.
			36					Drilling 21-24': mostly medium-coarse sand and fine gravel.
			50b/3"					
	24-26	S1	50	50+	9	6		Sand, fine to coarse grain, little gravel, trace fines,wet, brown, SW/SP.
			60b/3"					60b/3": spoon bounced for half of the blows (throughout drive).
	29-31	S1	25	47	24	9		Sand, fine to coarse grain, trace gravel, trace fines, wet, brown, SP.
			24					
			23					
			27					Drilling 31-34': mostly fine to coarse sand with some gravel layers.
	34-36	S1	21	56	24	8		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet, brown, SP.
			27					
			29					Drilling 36-39': mostly fine to medium sand.
			20					
	39-41	S1	18	41	24	9		Sand, fine to medium grain, trace gravel, trace fines, wet, brown, SP.
			13					
			28					
			14					Detail arrives at 10:15.
	44-46	S1	11	13	24	5		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet, brown, SP.
			6					
			7					Drilling 46-49': mostly fine to medium sand.
			9					
	49-51	S1	9	12	24	5		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet, brown, SP.
			6					
			6					Drilling 51-54': mostly fine to medium sand.
			6					
	54-56	S1	16-18	37	24	7		Sand, fine to medium grain, no gravel, trace fines, wet, brown, SP.
			19-17					
	59-61	S1	14-16	31	24	8		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet, brown, SP.
			15-17					

Notes: * Groundwater depth estimated, because drilling mud used.
Drilling performed with 4" casing w/tricone bit and mud (Cetco Variflo QD quick dispersing Guar Gum). Standard Penetration Testing used to take split spoon samples (S-#) w/ trip cable. Mobile Drill Rig.B53
Name (intro, modifier, predominant), Gradation and/or Plasiticity, Density or Consistency, Moisture, Color, Structure, Local Name, USC Symbol

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 2- 4 , firm (f) = 4-8 , stiff (st) = 8-15, very stiff (vs) = 15-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

DEERE & AULT CONSULTANTS, INC.

		Boring	SPT-2 STA. 7+50
		Page	1 of 1
		Date	Tuesday, September 09, 2008
		Weather	60-70's, Sunny until 14:15. 14:15 and later - raining (hard at time).
Groundwater Depth	* feet	Project Name	East Chop Bluff
Total Depth of Hole	58 feet	Job No	D&A 0193.021.00, CLE 08.057.100, Dig Safe 2009-360-2447 (9/5/08)
Depth to Rock	N.E. feet	Driller	Geologic, Scott Canning (508) 384-4434, Dave Sheldon (drill foremen) & Taylor
N.E. = not encountered		Logged By	Joel Q. Kantola (978) 886 4550

Elev. feet	Depth feet	Sample Type & No.	Blows per 6"	RQD or Blow Count	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions 7:15-7:45: Setup on SPT-2. 7:45-9:15: Advance hole to 24'. Pump breaks down, followed by drill rig starter. 9:15-14:15: Wait for mechanic. 14:15-15:45 : Mechanics fixes rig. John Breckenridge stops by the site. 15:45-17:45: Advance hole to 58'. Crews cleanup to about 18:30 (with police detail). D&A leaves on 18:15 ferry.
								8" asphalt.
	1-3	S1	18	24	24	10		Sand, fine grain, no gravel, trace fines, moist, brown, SP.
			14					
			10					
			11					
	4-6	S1	10	27	24	6		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet*, brown, SP.
			11					*wet from drilling.
			16					
			15					Drill 6-9': mostly fine sand, but lesser amount of medium to coarse grain and fine gravel.
	9-11	S1	19	46	24	6		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet*, brown, SP.
			21					Mix drilling mud.
			25					Drill 11-14': fine to coarse sand.
			23					
	14-16	S1	14	NA	7	0		No recovery. 50b = 50 blows bouncing on something hard.
			50b/3"					
								Drill 16-19': fine to medium sand with very thin to thin gravelly layers.
	19-21	S1	17	34	24	0		Tip filled with clean gravel (had to be hammered out) - not jarred.
			18					
			16					Drill 21-24': gravelly layers to a depth of 23'. Smooth drilling from 23-24'.
			17					
	24-26	S1	35	25	24	5		Sand, fine to coarse grain, trace gravel, trace fines, wet from drilling, brown, SP. (3:45pm)
			13					
			12					Drill 26-29': fine to coarse sand. Still have to case hole due to lost drill mud circulation.
			8					
	29-31	S1	9	13	24	2		Sand, fine to coarse grain, little gravel, trace fines, wet from drilling, brown, SP/SW (wash material?).
			7					The blow count may be low due to thin drilling mud. Mud thickened.
			6					
			5					
								Mud circulation lost throughout. Difficult to advance hole. Case to a depth of 39'.
								Drill 36 to 39': Gravelly material with trace to little sand in cuttings.
	39-41	S1	23	32	24	4		Sand, mostly fine to medium grain with lesser amounts of coarse grain, trace gravel, trace fines,
			16					wet, brown, SP.
			16					
			28					Attempts to drill with mud, but keep losing circulation. Decide to case hole down to 49'.
								Drill 41-44': mostly gravel with little sand.
								Drive casing to 49': Casing drove very hard and slow.
								Drill 44-49': sand and gravel.
								Raining very hard.
	49-51	S1	35	52	24	5		Sand, fine to coarse grain, some gravel, trace fines, wet, brown, SW.
			24					
			28					Drill to 58': fine to coarse sand, with trace amounts gravel.
			25					
								Raining very hard.

Notes: * Groundwater depth estimated, because drilling mud used.
Drilling performed with 4" casing w/tricone bit and mud (Cetco Variflo QD quick dispersing Guar Gum). Standard Penetration Testing used to take split spoon samples (S-#) w/ trip cable. Mobile Drill Rig.B53
Name (intro, modifier, predominant), Gradation and/or Plasiticity, Density or Consistency, Moisture, Color, Structure, Local Name, USC Symbol

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 2- 4 , firm (f) = 4-8 , stiff (st) = 8-15, very stiff (vs) = 15-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

DEERE & AULT CONSULTANTS, INC.

		Boring	SPT-3 STA 12+50
		Page	1 of 1
		Date	Monday, September 08, 2008
		Weather	60-70's, Sunny
Groundwater Depth	* feet	Project Name	East Chop Bluff
Total Depth of Hole	61 feet	Job No	D&A 0193.021.00, CLE 08.057.100, Dig Safe 2009-360-2447 (9/5/08)
Depth to Rock	N.E. feet	Driller	Geologic, Scott Canning (508) 384-4434, Dave Sheldon (drill foremen) & Taylor
N.E. = not encountered		Logged By	Joel Q. Kantola (978) 886 4550

Elev. feet	Depth feet	Sample Type & No.	Blows per 6"	RQD or Blow Count	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions
								9" asphalt.
	1-3	S1	21	27	24	9		Sand, fine grain, no gravel, trace fines, moist, brown, SP.
			16					
			11					
			14					
	4-6	S1	50b/3"	NA	3	0		No recovery.
	9-11	S1	23b	38	24	6		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, wet from drill water, brown, SP.
			19					
			19					Mix drilling mud.
			20					Drill 11-14': Mostly fine to medium sand, with lesser amount of coarse sand.
	14-16	S1	12	30	24	7		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, moist, brown, SP.
			13					
			17					Drill 16-19': Mostly fine to medium sand, with lesser amount of coarse sand.
			20					
	19-21	S1	14	35	24	6		Sand, fine to medium with trace coarse grain, trace gravel, trace fines, moist, brown, SP.
			14					
			21					Drill 21-24': Mostly fine to medium sand, with lesser amount of coarse sand.
			15					
	24-26	S1	24	43	24	6		Sand, fine to medium with trace coarse grain, trace gravel, trace/little fines, moist, brown, SP.
			21					
			22					Drill 26-29': Mostly fine to coarse sand.
			20					
	29-31	S1	28	63	24	9		Sand, fine with trace medium grain, trace gravel, trace fines, moist, brown, SP.
			30					
			33					Drill 31-34': Mostly fine to coarse sand, with occassional thin gravelly layers.
			33					
	34-36	S1	54b	68	24	7		Sand, fine to coarse grain, trace gravel, trace to little fines, wet, brown, SP/SW.
			34					
			34					Drill 36-39': Boulder 36-37, remainder is fine to coarse sand and gravelly layers.
			27					
	39-41	S1	25	51	21	7		Sand, fine to coarse grain(mostly medium grain), trace gravel, trace fines, wet, brown, SP/SW.
			24					
			27					Drill 41-44': fine to coarse sand with gravelly layers.
			50b/3"					
	44-46	S1	15	33	24	8		Sand, fine to coarse (mostly medium) grain, no gravel, trace fines, wet, brown, S.
			14					
			19					Drill 46-49': fine to coarse sand.
			28					
	49-51	S1	24	28	24	7		Sand, fine to coarse grain but mostly medium with very thin beds of coarse sand, trace gravel,
			13					no fines, wet, brown, SP.
			15					Drill 51-54': fine to medium sand.
			26					
	54-56	S1	35-28	51	24	9		Sand, fine to medium grain, no gravel,trace fines, wet, brown, SP.
			23-26					1" interbed of clean coarse sand and fine gravel.
								Drill 56-59': fine to medium sand.
	59-61	S1	13-9	28	24	6		Sand, fine to coarse (mostly medium) grain, trace gravel, trace fines, wet, brown, SP.
			19-20					

Notes: * Groundwater depth estimated, because drilling mud used.
Drilling performed with 4" casing w/tricone bit and mud (Cetco Variflo QD quick dispersing Guar Gum). Standard Penetration Testing used to take split spoon samples (S-#) w/ trip cable. Mobile Drill Rig.B53
Name (intro, modifier, predominant), Gradation and/or Plasiticity, Density or Consistency, Moisture, Color, Structure, Local Name, USC Symbol

Key: Fines Content: trace (tr) = 1-10%, little (lt) = 10-20%, some (sm) = 20-35%, and (&) = 35-50%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 4-10, medium dense (md) = 10-30, dense (d) = 30-50 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 2- 4 , firm (f) = 4-8 , stiff (st) = 8-15, very stiff (vs) = 15-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

cle engineering		Boring	SPT-4
		Page	1 of 2
		Date	9-Nov-16
		Weather	Overcast, 40-50, calm
Groundwater Depth	+/-29' feet	Project Name	East Chop Slope Stabilization
Total Depth of Hole	61 feet	Job No	
Depth to Cored Rock	N/A feet	Driller	New England Boring, Jerry, James
		Logged By	M.Campagnone, P.E. CLE Engineering

Elev. 47 feet	Depth feet	Sample Type & No.	Blows per 6"	Uncorr (Corr) Blows	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions
47' to 45'	' to 2'	S-1	40 15 12 7	27	24"	13		S1= Med dense, brown, fine sand, dry, trc silt (SP) Cut through 4" asphault *No Casing set prior to S2*
43' to	4' to	S-2	6	20	24"	7		S2= Med Dense, yellow, Fine-med sand, dry, trc gravel, trc silt (SP/SW)
41'	6'		9 11 12					*Set 10' of 4" casing, tip to 9'*
38' to	9' to	S-3	65	41	24"	5		S3= Dense, yellow, Crse-Fine sand, wet, trc gravel, trc silt (SP/SW)
36'	11'		28 13 15					*Set 5' of 4" casing, tip to 14'*
33' to	14' to	S-4	9	18	24"	6		S4= Med. Dense, yellow, med-crse sand, moist, trc gravel, trc silt (SW/SP)
31'	16'		9 9 11					*Set 5' of 4" casing, tip to 19'*
28' to	19' to	S-5	6	16	24"	10		S5= Med. Dense, yellow, med-crse sand, moist, trc gravel, trc silt (SW/SP)
26'	21'		7 9 10					*Set 5' of 4" casing, tip to 24'*
23' to	24' to	S-6	9	21	24"	13		S6= Med. Dense, yellow, med-fine sand, moist, trc gravel, trc silt (SW/SP)
21'	26'		10 11 16					*Set 5' of 4" casing, tip to 29'* *Add quik-gel bentontie drilling mud*
18' to	29' to	S-7	7	11	24"	2		S7= Med. Dense, yellow, med-fine sand, wet, trc gravel, trc silt (SW/SP)
16'	31'		6 5 4					*Set 5' of 4" casing, tip to 34'*
13' to	34' to	S-8	5	28	24"	14		S8= Med. Dense, yellow, med-fine sand, wet, trc gravel, trc silt (SW/SP)
11'	36'		12 16 23					*Attempt open hole, losing water* *Set 5' of 4" casing, tip to 39'*
8' to	39' to	S-9	13	17	24"	16		S9= Med. Dense, yellow, Med-fine sand, wet, trc gravel, trc silt (SW/SP)
6'	41'		9 8 8					*Set 5' of 4" casing, tip to 44'*
3' to	44' to	S-10	19	38	24"	13		S10= Dense, yellow, Med-fine sand, wet, trc gravel, trc silt (SW/SP)
1'	46'		20 18 15					*Set 5' of 4" casing, tip to 49'*
-2' to	49' to	S-11	11	37	24"	8		S11= Dense, yellow, Med-fine sand, wet, trc gravel, trc silt (SW/SP)
-4'	51'		17 20 16					*Drill & Wash open hole*

Notes: Boring located on East Chop Ave. 6opposite drive for #172, on east EOP ATV rig, all SPT taken with safety hammer - cathead (1.5 wraps) (Ef 70%).
Drill and wash w/SPT and sampling 5' intervals. Blow counts shown in (xx) are corrected to N70
SPT done with 2" split spoon sampler and safety hammer, dropped by cathead (2 wraps)

Name (Density, Color, Classification), Moisture, Plasticity, Secondary grain Size, (USC Group Symbol)

Key: Fines Content: trace (tr) = <5%, little (lt) = 6-15%, few = 16-30%, some (sm) = 31-49%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 5-10, medium dense (md) = 11-29, dense (d) = 30-49 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 3 - 4 , medium (f) = 5-8 , stiff (st) = 9-15, very stiff (vs) = 16-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

cle engineering		Boring	SPT-4
		Page	2 of 2
		Date	9-Nov-16
		Weather	Overcast, 40-50, calm
Groundwater Depth	+/-25' feet	Project Name	East Chop Slope Stabilization
Total Depth of Hole	61 feet	Job No	
Depth to Cored Rock	N/A feet	Driller	New England Boring, Jerry, James
		Logged By	M.Campagnone, P.E. CLE Engineering

Elev. 45 feet	Depth feet	Sample Type & No.	Blows per 6"	Uncorr (Corr) Blows	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions
-9' to -11'	54' to 56'	S-12	14 10 12 16	22	24"	16		S12= Med. Dense, yellow, Med-fine sand, wet, trc gravel, trc silt (SW/SP) *Drill & Wash open hole*
-14' to -16'	59' to 61'	S-13	10 9 16	19	24"	12		S13= Med. Dense, yellow, Med-fine sand, wet, trc gravel, trc silt (SW/SP) *Drill & Wash open hole*

Notes: Boring located on East Chop Ave. 6opposite drive for #172, on east EOP ATV rig, all SPT taken with safety hammer - cathead (1.5 wraps) (Ef 70%).
Drill and wash w/SPT and sampling 5' intervals. Blow counts shown in (xx) are corrected to N70
SPT done with 2" split spoon sampler and safety hammer, dropped by cathead (2 wraps)

Name (Density, Color, Classification), Moisture, Plasticity, Secondary grain Size, (USC Group Symbol)

Key: Fines Content: trace (tr) = <5%, little (lt) = 6-15%, few = 16-30%, some (sm) = 31-49%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 5-10, medium dense (md) = 11-29, dense (d) = 30-49 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 3 - 4 , medium (f) = 5-8 , stiff (st) = 9-15, very stiff (vs) = 16-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

cle engineering		Boring	SPT-5
		Page	1 of 2
		Date	8-Nov-16
		Weather	Sunny, 40-50d , Calm
Groundwater Depth	+/-25' feet	Project Name	East Chop Slope Stabilization
Total Depth of Hole	61 feet	Job No	
Depth to Cored Rock	N/A feet	Driller	New England Boring, Jerry, James
		Logged By	M.Campagnone, P.E. CLE Engineering

Elev. 45 feet	Depth feet	Sample Type & No.	Blows per 6"	Uncorr (Corr) Blows	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions
45' to 43'	' to 2'	S-1	15 14 10 6	24	24"	11		S1= Med dense, brown, fine sand, dry, trc silt (SP) Cut through 4" asphault *No Casing set prior to S2*
41' to	4' to	S-2	4	10	24"	16		S2= Loose, brown, Fine-med sand, dry, trc gravel, trc silt (SP/SW)
39'	6'		5 5 6					*Set 10' of 4" casing, tip to 9'*
36' to	9' to	S-3	11	23	24"	7		S3= Med Dense, brown, Fine-med sand, moist, trc gravel, trc silt (SP/SW)
34'	11'		12 11 9					*Set 5' of 4" casing, tip to 14'* *Add quik-gel bentontie drilling mud*
31' to	14' to	S-4	10	16	24"	8		S4= Med. Dense, orange, Fine-crse sand, moist, trc gravel, trc silt (SW/SP)
29'	16'		8 8 7					*Set 5' of 4" casing, tip to 19'*
26' to	19' to	S-5	86	46	24"	9		S5= Med. Dense, orange, Fine-crse sand, moist, trc gravel, trc silt (SW/SP)
24'	21'		23 23 11					rock frag in top of spoon. *Set 5' of 4" casing, tip to 24'*
21' to	24' to	S-6	10	9	24"	11		S6= Med. Dense, yellow, Med-fine sand, moist (SW/SP)
19'	26'		5 4 6					*Set 5' of 4" casing, tip to 29'*
16' to	29' to	S-7	7	23	24"	3		S7= Med. Dense, yellow, Crse sand, some gravel, trc silt (SW/SP)
14'	31'		7 16 10					*Set 5' of 4" casing, tip to 34'*
11' to	34' to	S-8	10	18	24"	3		S8= Med. Dense, yellow, Fine-crse sand, wet, trc gravel, trc silt (SW)
9'	36'		8 10 16					*Set 5' of 4" casing, tip to 39'*
6' to	39' to	S-9	26	44	24"	10		S9= Dense, yellow, Med-crse sand, wet, little gravel, trc silt (SP)
4'	41'		23 21 28					*Set 5' of 4" casing, tip to 44'*
1' to	44' to	S-10	13	27	24"	7		S10= Med. Dense, yellow, Med-crse sand, wet, little gravel, trc silt (SP)
-1'	46'		13 14 11					*Drill & Wash open hole*
-4' to	49' to	S-11	17	39	24"	2		S11= Dense, yellow, Med-crse sand, wet, little gravel, trc silt, 1" gravel in spoon (SP)
-6'	51'		19 20 19					*Drill & Wash open hole*

Notes: Boring located on East Chop Ave. 60' north of drive #180, on EOP ATV rig, all SPT taken with safety hammer - cathead (1.5 wraps) (Ef 70%).
Drill and wash w/SPT and sampling 5' intervals. Blow counts shown in (xx) are corrected to N70
SPT done with 2" split spoon sampler and safety hammer, dropped by cathead (2 wraps)

Name (Density, Color, Classification), Moisture, Plasticity, Secondary grain Size, (USC Group Symbol)

Key: Fines Content: trace (tr) = <5%, little (lt) = 6-15%, few = 16-30%, some (sm) = 31-49%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 5-10, medium dense (md) = 11-29, dense (d) = 30-49 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 3 - 4 , medium (f) = 5-8 , stiff (st) = 9-15, very stiff (vs) = 16-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

cle engineering		Boring	SPT-5
		Page	2 of 2
		Date	8-Nov-16
		Weather	Sunny, 40-50d , Calm
Groundwater Depth	+/-25' feet	Project Name	East Chop Slope Stabilization
Total Depth of Hole	61 feet	Job No	
Depth to Cored Rock	N/A feet	Driller	New England Boring, Jerry, James
		Logged By	M.Campagnone, P.E. CLE Engineering

Elev. 45 feet	Depth feet	Sample Type & No.	Blows per 6"	Uncorr (Corr) Blows	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions
-9' to -11'	54' to 56'	S-12	23 14 12 8	26	24"	6		S12= Med dense, yellow, Fine-med sand, ltle gravel, trc silt (SW/SP) *Drill & Wash open hole*
-14' to -16'	59' to 61'	S-13	12 11 14 21	25	24"	11		S13= Dense, yellow, Med-crse sand, wet, little gravel, trc silt (SP) *Drill & Wash open hole*

Notes: Boring located on East Chop Ave. 60' north of drive #180, on EOP ATV rig, all SPT taken with safety hammer - cathead (1.5 wraps) (Ef 70%).
Drill and wash w/SPT and sampling 5' intervals. Blow counts shown in (xx) are corrected to N70
SPT done with 2" split spoon sampler and safety hammer, dropped by cathead (2 wraps)

Name (Density, Color, Classification), Moisture, Plasticity, Secondary grain Size, (USC Group Symbol)

Key: Fines Content: trace (tr) = <5%, little (lt) = 6-15%, few = 16-30%, some (sm) = 31-49%
Cohesionaless Soil Density (blows/ft): very loose (vl) = 0-4, loose (l) = 5-10, medium dense (md) = 11-29, dense (d) = 30-49 , very dense (vd) = 50+
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 3 - 4 , medium (f) = 5-8 , stiff (st) = 9-15, very stiff (vs) = 16-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

cle engineering		Boring	SPT-6
		Page	1 of 1
		Date	7-Nov-16
		Weather	Sunny, 40-50d , Wind 15-20 NE, E
Groundwater Depth	+/-25' feet	Project Name	East Chop Slope Stabilization
Total Depth of Hole	51 feet	Job No	
Depth to Cored Rock	N/A feet	Driller	New England Boring, Jerry, James
		Logged By	M.Campagnone, P.E. CLE Engineering

Elev. 38 feet	Depth feet	Sample Type & No.	Blows per 6"	Uncorr (Corr) Blows	Pen. inch	Rec. inch	Graphic Log	Soil & Rock Descriptions
38' to 36'	' to 2'	S-1	2 2 3 5	5	24"	13"		S1= Loose, brown, fine sand, dry, trc silt (SP) *No Casing set prior to S2*
34' to	4' to	S-2	6	17	24"	15		S2= Med. Dense, orange, Med-Fine sand, dry, trc gravel, trc silt, rock in tip (SP/SW)
32'	6'		8 9 17					*Set 10' of 4" casing, tip to 9'* *Add quik-gel bentontie drilling mud*
29' to	9' to	S-3	64	REF	24"	0		S3= Med. Dense, yellow, Fine-med sand, moist, little gravel, little silt, 1" rock in spoon (SW/SP)
27'	11'		Ref					Wood in spoon first attempt, Sent spoon dwon with #300 hammer, recovered 8" *Drill & Wash open hole*
24' to	14' to	S-4	12	23	24"	7		S4= Med. Dense, yellow, Med-crse sand, moist, little gravel, trc silt (SW/SP)
22'	16'		10 13 13					*Drill & Wash open hole*
19' to	19' to	S-5	12	19	24"	6		S5= Med. Dense, yellow, Med-crse sand, wet, little gravel, trc silt (SW/SP)
17'	21'		10 9 8					*Drill & Wash open hole*
14' to	24' to	S-6	26	95	24"	10		S6= Med. Dense, yellow, Crse-fine sand, wet, some gravel, trc silt, weathered rock (SW)
12'	26'		57 38 34					*Drill & Wash open hole*
9' to	29' to	S-7	7	20	24"	4		S7= Med. Dense, yellow, Med-fine sand, wet, little gravel, trc silt (SP)
7'	31'		7 13 26					*Drill & Wash open hole*
4' to	34' to	S-8	15	26	24"	4		S8= Med. Dense, yellow, Med-fine sand, wet, little gravel, trc silt (SP)
2'	36'		14 12 14					*Drill & Wash open hole*
-1' to	39' to	S-9	17	12	24"	3		S9= Med. Dense, yellow, Med-fine sand, wet, little gravel, trc silt, 1" gravel in spoon (SP)
-3'	41'		7 5 9					*Drill & Wash open hole*
-6' to	44' to	S-10	10	24	24"	7		S10= Med. Dense, yellow, Med-crse sand, wet, little gravel, trc silt (SP)
-8'	46'		12 12 12					*Drill & Wash open hole*
-11' to	49' to	S-11	21	52	24"	5		S11= Dense, yellow, Med-crse sand, wet, little gravel, trc silt (SP)
-13'	51'		25 27 20					*Drill & Wash open hole*

Notes: Boring located on East Chop Ave. 21' north of CL Monroe, 10' east of EOP ATV rig, all SPT taken with safety hammer - cathead (1.5 wraps) (Ef 70%).
Drill and wash w/SPT and sampling 5' intervals. Blow counts shown in (xx) are corrected to N70
SPT done with 2" split spoon sampler and safety hammer, dropped by cathead (2 wraps)

Name (Density, Color, Classification), Moisture, Plasticity, Secondary grain Size, (USC Group Symbol)

Key: Fines Content: trace (tr) = <5%, little (lt) = 6-15%, few = 16-30%, some (sm) = 31-49%
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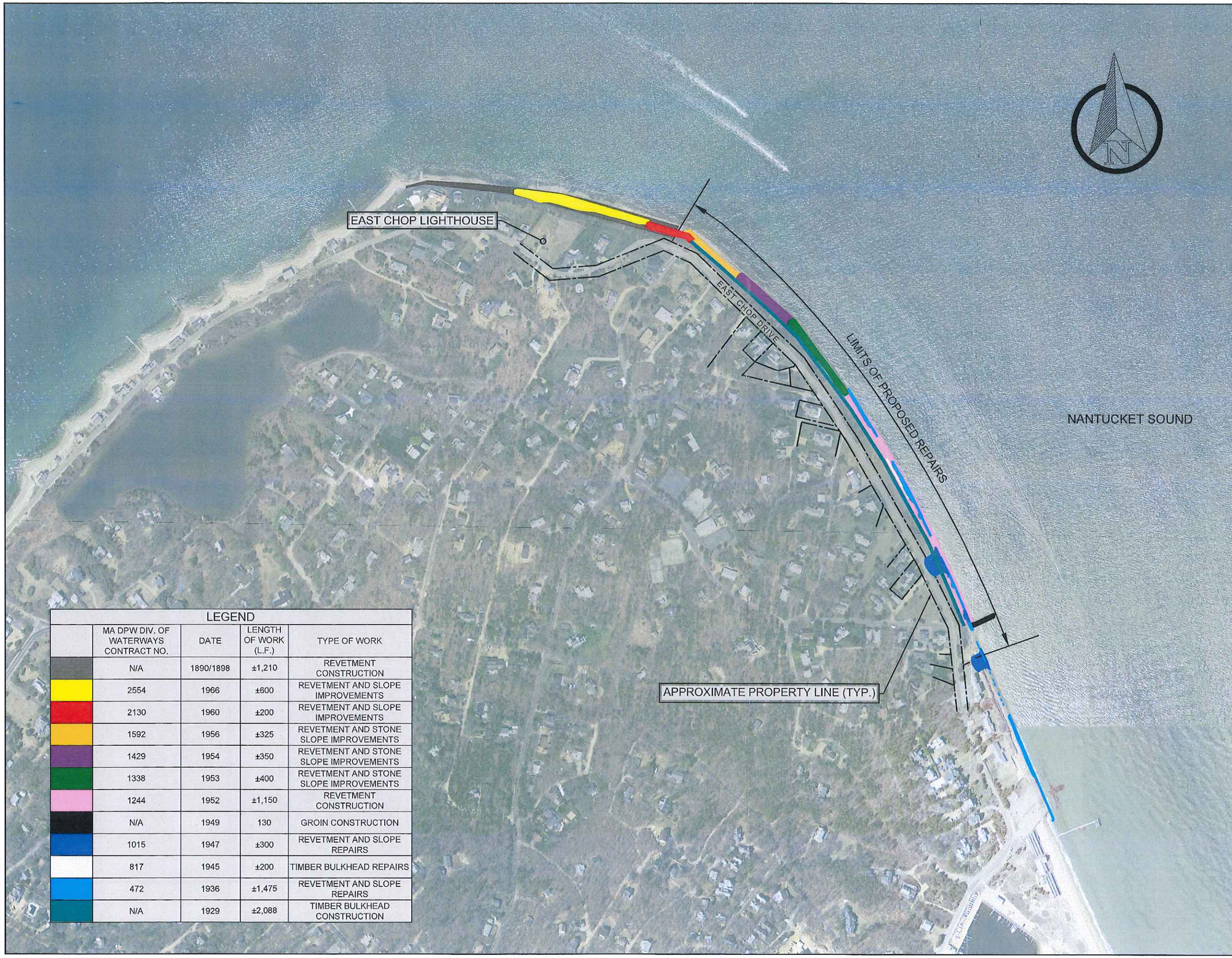
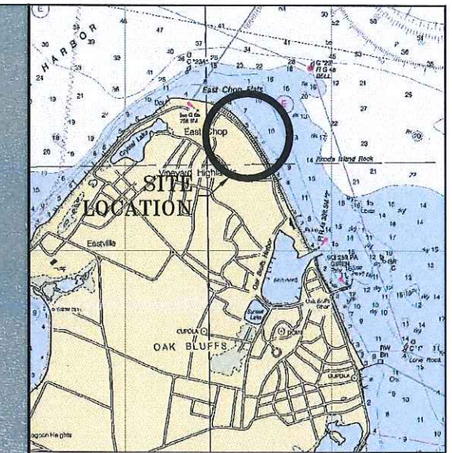
Cohesive Soil Consistency (bows/ft): very soft (vs) <2, soft (s) = 3 - 4 , medium (f) = 5-8 , stiff (st) = 9-15, very stiff (vs) = 16-30, hard (h) >30
Color: br = brown, gy = grey, gn = green, yl = yellow, ol = olive, og = orange, bl = black
Plasticity: np = non plastic, sp = slightly plastic, mp = moderately plastic, hp = highly plastic, vhp = very highly plastic

EXHIBIT E

Historic Engineered Bank Repair Plan dated February 26, 2014



LEGEND				
	MA DPW DIV. OF WATERWAYS CONTRACT NO.	DATE	LENGTH OF WORK (L.F.)	TYPE OF WORK
	N/A	1890/1898	±1,210	REVETMENT CONSTRUCTION
	2554	1966	±600	REVETMENT AND SLOPE IMPROVEMENTS
	2130	1960	±200	REVETMENT AND SLOPE IMPROVEMENTS
	1592	1956	±325	REVETMENT AND STONE SLOPE IMPROVEMENTS
	1429	1954	±350	REVETMENT AND STONE SLOPE IMPROVEMENTS
	1338	1953	±400	REVETMENT AND STONE SLOPE IMPROVEMENTS
	1244	1952	±1,150	REVETMENT CONSTRUCTION
	N/A	1949	130	GROIN CONSTRUCTION
	1015	1947	±300	REVETMENT AND SLOPE REPAIRS
	817	1945	±200	TIMBER BULKHEAD REPAIRS
	472	1936	±1,475	REVETMENT AND SLOPE REPAIRS
	N/A	1929	±2,088	TIMBER BULKHEAD CONSTRUCTION



LOCUS PLAN

NOTES:

1. AERIAL IMAGE FROM MASS GIS DATABASE (2009).
2. LOCATIONS OF PROPERTY LINES ARE FROM PLAN TITLED "SITE PLAN IN OAK BLUFFS, MASS." BY VINEYARD ENGINEERING AND LAND SURVEYING, INC. DATED MAY 29, 2013 AND SHOULD BE CONSIDERED APPROXIMATE.
3. REPAIR AREAS HAVE BEEN SCALED IN FROM MA DPW DIV. OF WATERWAYS REFERENCE DRAWINGS AND SHOULD BE CONSIDERED APPROXIMATE.

REFERENCES:

DRAWINGS

- "PROPOSED SHORE PROTECTION HIGHLANDS" JUL. 1936 CONTRACT NO. 472.
- "PROPOSED BULKHEAD REPAIRS" JAN. 1945 CONTRACT NO. 817.
- "REPAIRS TO BULKHEAD ATLANTIC AVE" NOV. 1947 CONTRACT NO. 1015.
- "SHORE PROTECTION EAST CHOP BULKHEAD REVETMENT" JUN. 1952 CONTRACT NO. 1244.
- "PROPOSED SHORE PROTECTION STONE MOUND" SEP. 1953 CONTRACT NO. 1338.
- "PROPOSED SHORE PROTECTION STONE MOUND CONSTRUCTION" SEP. 1954 CONTRACT NO. 1429.
- "PROPOSED SHORE PROTECTION STONE MOUND CONSTRUCTION" MAR. 1956 CONTRACT NO. 1592.
- "PROPOSED SHORE PROTECTION STONE MOUND CONSTRUCTION" APR. 1960 CONTRACT NO. 2130.
- "PROPOSED SHORE PROTECTION STONE MOUND" JUN. 1966 CONTRACT NO. 2554.

REPORTS

- "BEACH EROSION CONTROL REPORT ON COORPERATIVE STUDY OF MARTHA'S VINEYARD MASSACHUSETTS" BY U.S. ARMY ENGINEER DIVISION, NEW ENGLAND. AUG. 1965.

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PROJECT:
OAK BLUFF (CLIFF EMBANKMENT)
EAST CHOP DRIVE, OAK BLUFFS, MA

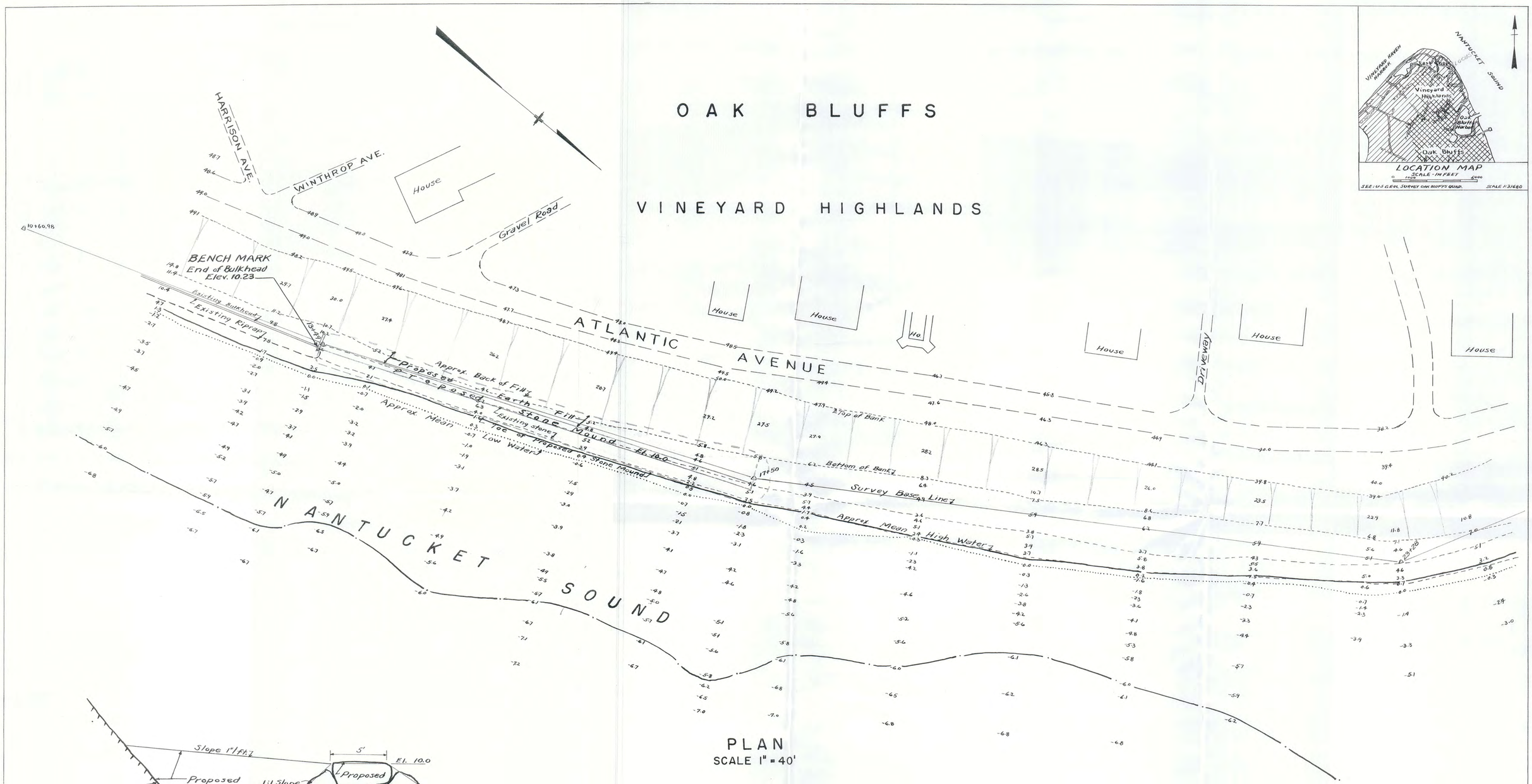
CLIENT:
TOWN OF OAK BLUFFS

cleengineering
15 Creek Road | Marion, Massachusetts 02738
t: 508.748.0937 | www.cleengineering.com

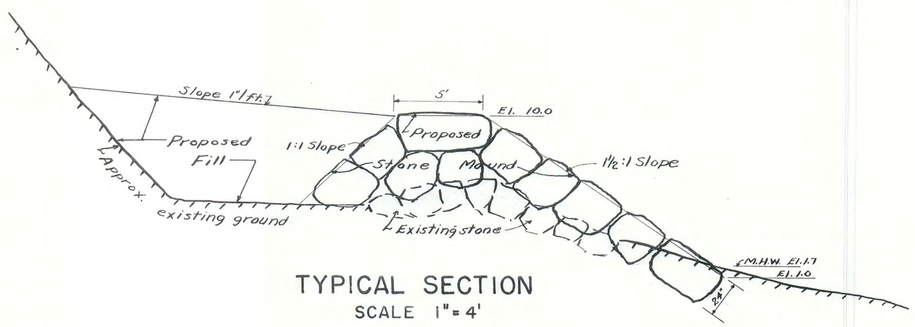
HISTORIC CONSTRUCTION FIGURE

SCALE:	NOT TO SCALE	CHECKED	DATE 2-26-14	DRAWING No.	
DRAWN BY:	DMG	BY:		COMP.CODE	13021
REVISION No.	DATE	COMMENT			

0200



PLAN
SCALE 1" = 40'



TYPICAL SECTION
SCALE 1" = 4'

NOTE
Elevations are in feet and tenths above the plane of mean low water. Minus figures show depths below the same.
Reference: Transit Book No. 582
Sounding Book No. 636

PROPOSED WORK SHOWN IN RED

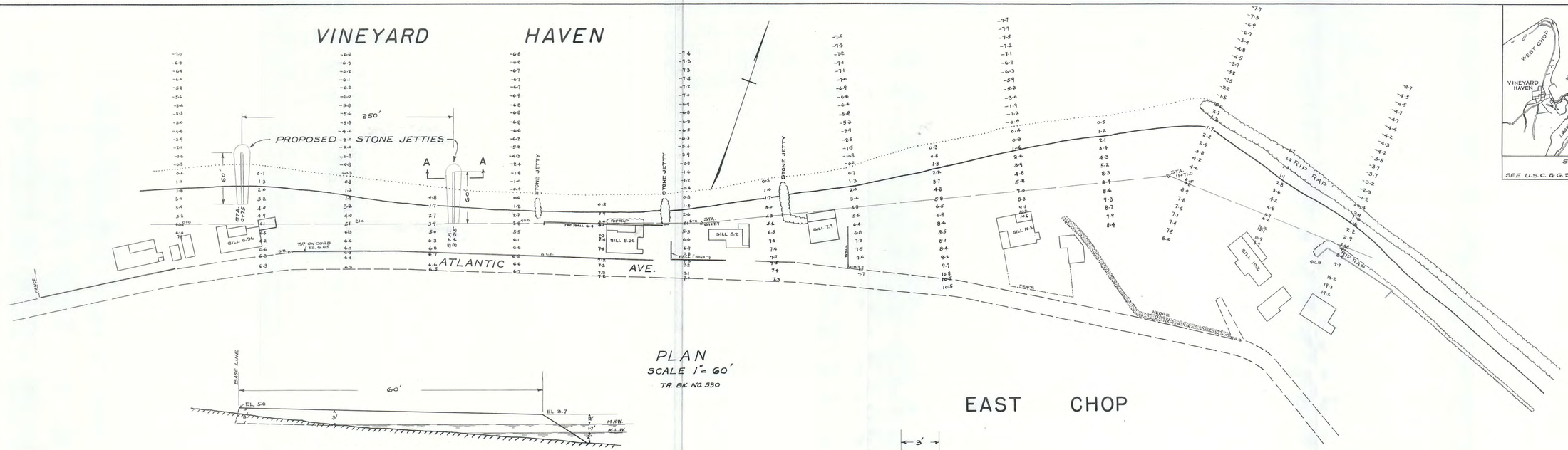
PROPOSED SHORE PROTECTION
STONE MOUND
VINEYARD HIGHLANDS
OAK BLUFFS
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
SEPTEMBER 1953
SCALE: AS SHOWN

Robert B. MacKenzie
ACTING DISTRICT WATERWAYS ENGINEER

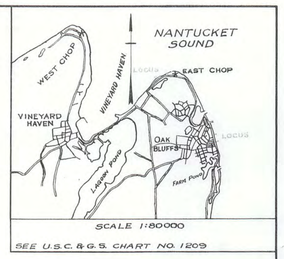
CONTRACT NO. 1338
ACC. 03149

K0200

K0200



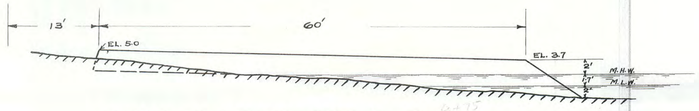
PLAN
SCALE 1" = 60'
TR. BK. NO. 530



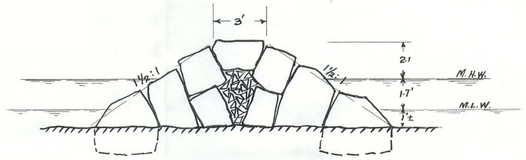
SCALE 1:80000
SEE U.S.C. & G.S. CHART NO. 1209

EAST CHOP

PROFILE OF PROPOSED JETTY AT STA. 3+25
SCALE 1" = 10'

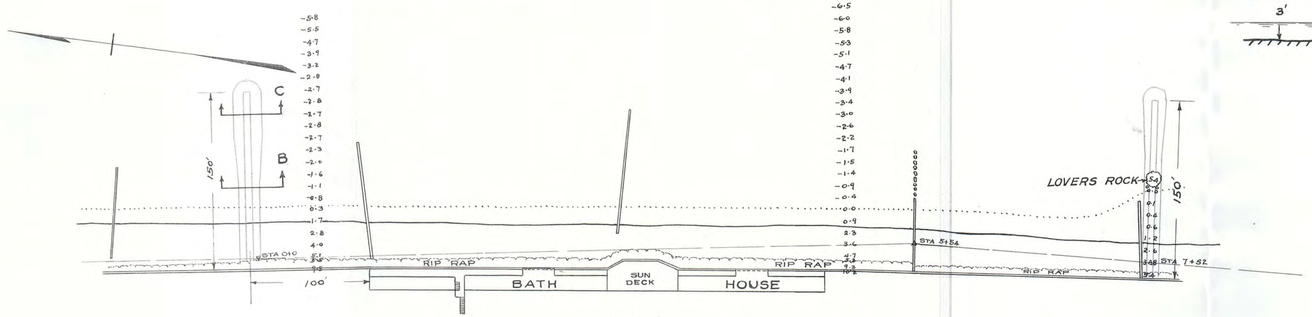


PROFILE OF PROPOSED JETTY AT STA. 2+0
SCALE 1" = 10'



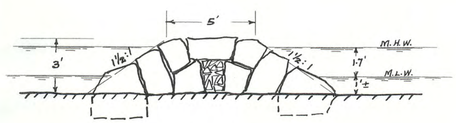
SECTION A-A
TYPICAL FOR EAST CHOP JETTIES
SCALE 1/4" = 1'

NANTUCKET SOUND

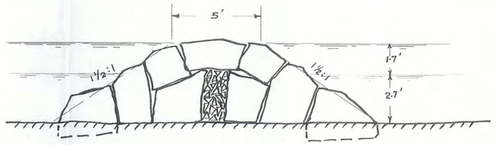


PLAN
SCALE 1" = 60'
TR. BKS. 530 & 533

OAK BLUFFS

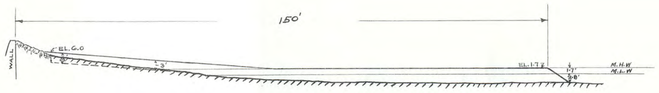


SECTION B-B

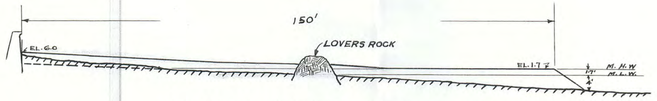


SECTION C-C

SECTIONS TYPICAL FOR JETTIES AT BATH HOUSE
SCALE 1/4" = 1'



PROFILE OF PROPOSED JETTY AT STA 0+50
SCALE 1" = 20'



PROFILE OF PROPOSED JETTY AT STA. 7+52
SCALE 1" = 20'

PROPOSED SHORE PROTECTION

OAK BLUFFS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS

MAY 1946

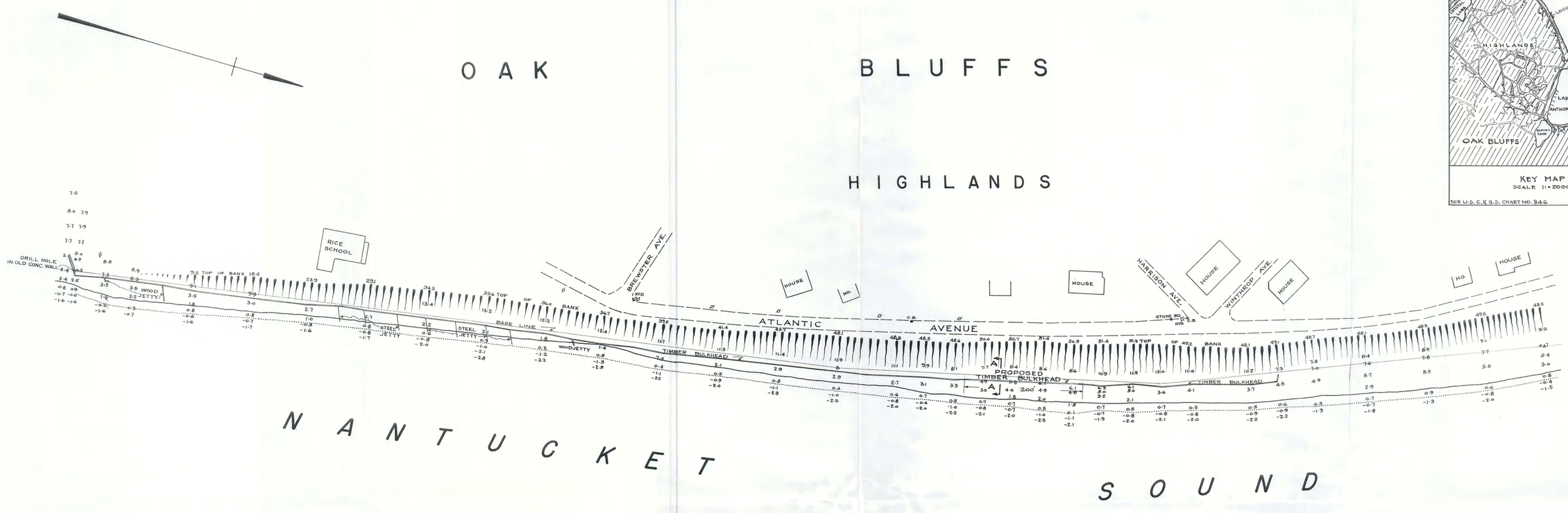
SCALES AS NOTED

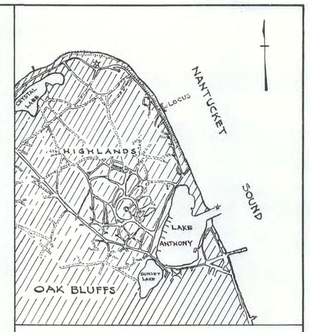
Earl A. Hutchins
DISTRICT WATERWAYS ENGINEER

CONTRACT NO. 892
ACC. 02515

K0200

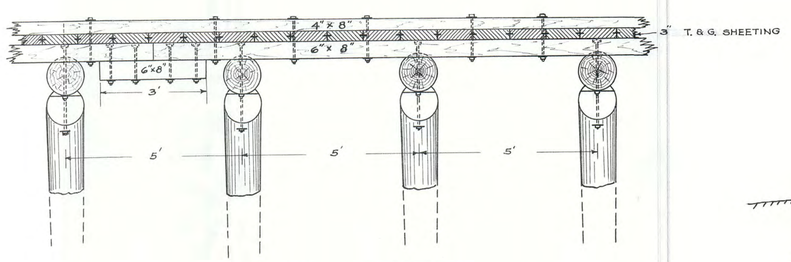
KO 200



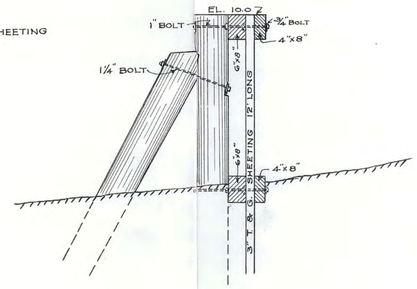


KEY MAP
SCALE 1"=20000

SEE U.S.C.&G.S. CHART NO. 346



PLAN OF BULKHEAD
SCALE — 1/2" = 1'-0"



SECTION A-A
SCALE — 1/2" = 1'-0"

ELEVATIONS ARE IN FEET AND TENTHS ABOVE THE PLANE OF M.L.W.
MINUS FIGURES SHOW DEPTHS BELOW THE SAME PLANE.
TR. BK. NO.

PROPOSED BULKHEAD REPAIRS

OAK BLUFFS
HIGHLANDS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
JANUARY 1945
SCALE 1" = 1000

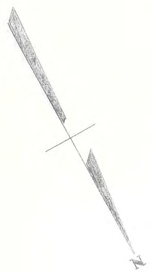
Everett N. Hutchins
DISTRICT WATERWAYS ENGINEER

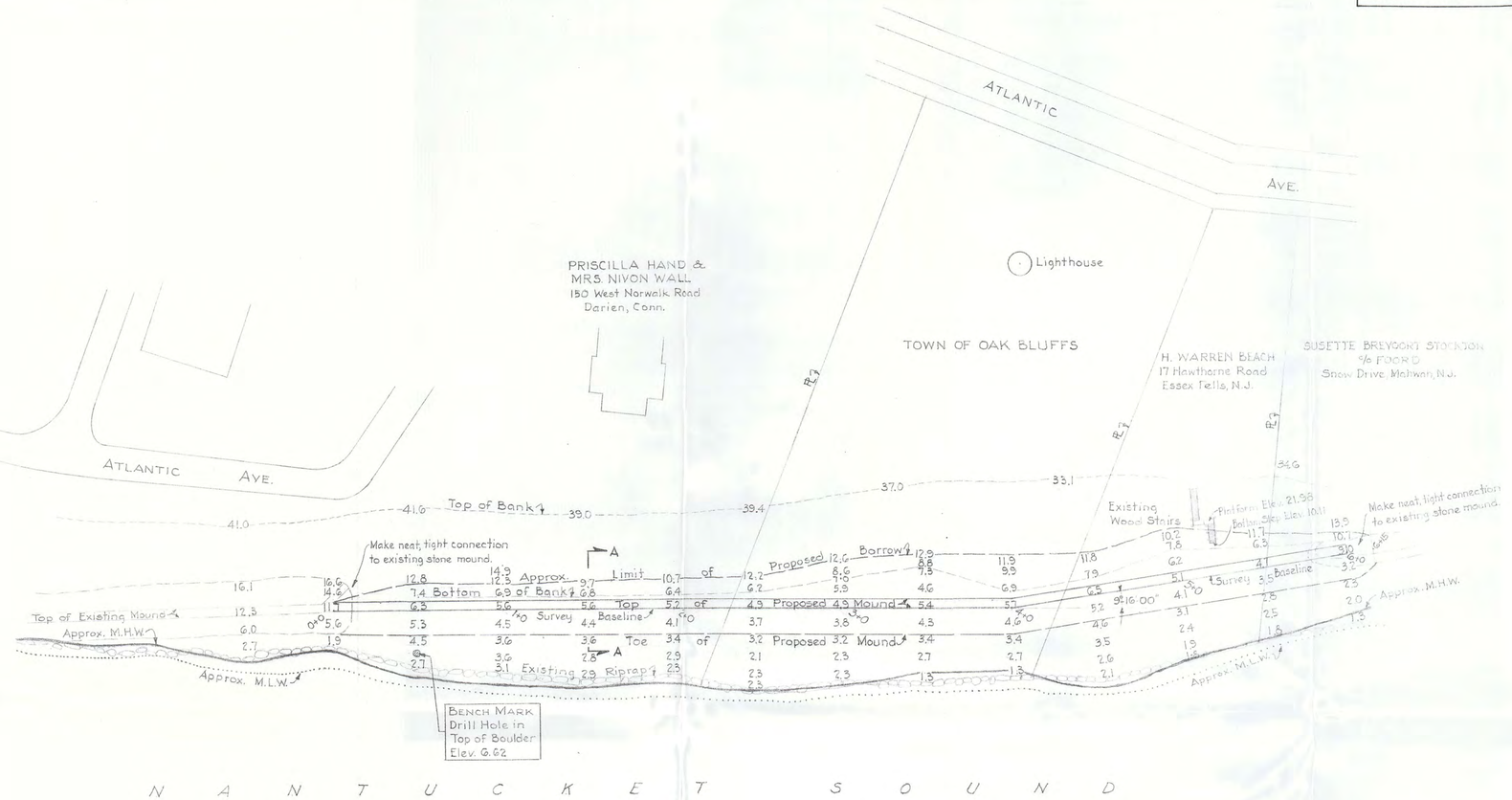
CONTRACT NO. 817

ACC. NO. 02447

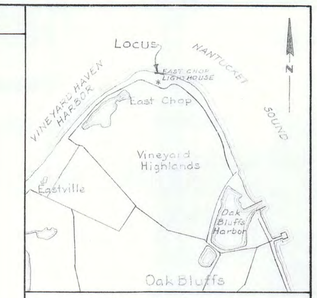
KO200

SHEET NO. 1 OF 1

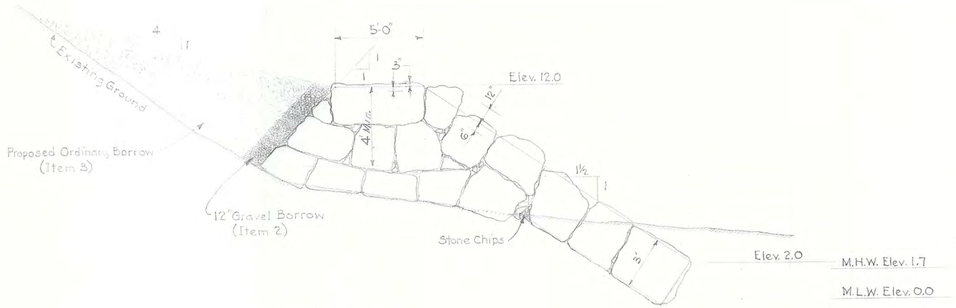




PLAN
Scale 1" = 40'
40 0 40 80



LOCATION PLAN
TRACED FROM U.S.G.S. EDGARTOWN, MASS. QUAD.
SCALE 1:24,000



SECTION A-A
Scale 1" = 4'
4 0 4 8

Note –
Elevations are in feet and tenths and refer to the plane of Mean Low Water.

Refer to Transit Book No. 958.

Survey made March 15, 1966 by Walter E. Rowley & Associates.

PROPOSED SHORE PROTECTION
STONE MOUND

EAST CHOP

VINEYARD HIGHLANDS, OAK BLUFFS

PLAN & DETAILS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS

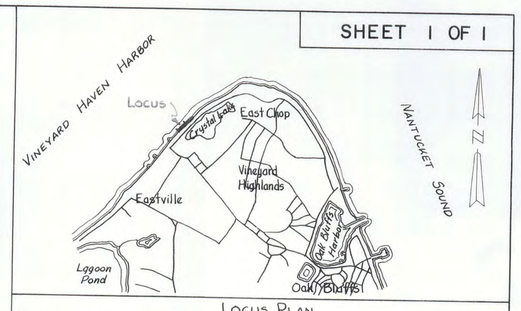
WALTER E. ROWLEY & ASSOCIATES
WEST WAREHAM, MASS.

JUNE 1966	DESIGNED BY E.H.B.	
D.P.W. REVIEW	TRACED BY E.H.B.	
BY JRK DATE 12/6/66	CHECKED BY R.A.O.	DEPUTY CHIEF ENGINEER, WATERWAYS

CONTRACT NO. 2554 | ACC. NO. 04544

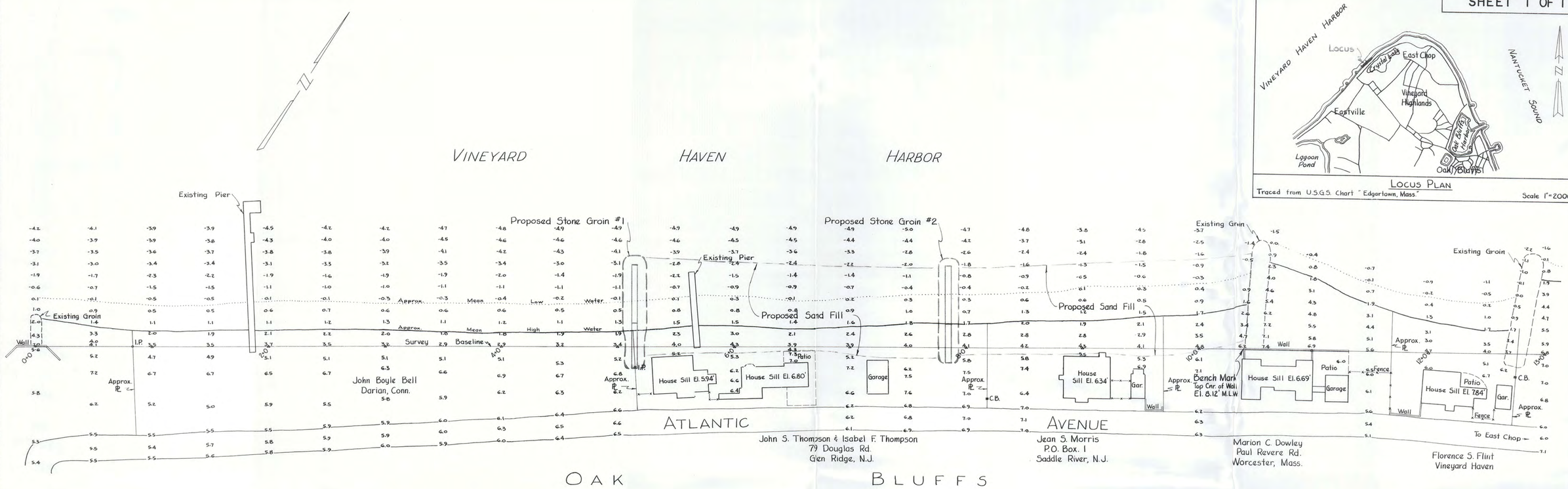
COMMONWEALTH OF MASSACHUSETTS ROBERT A. HANLAN REGISTERED PROFESSIONAL ENGINEER

SHEET 1 OF 1



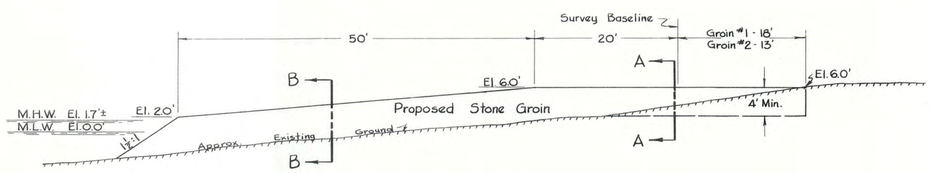
LOCUS PLAN

Traced from U.S.G.S. Chart "Edgartown, Mass." Scale 1"=2000'



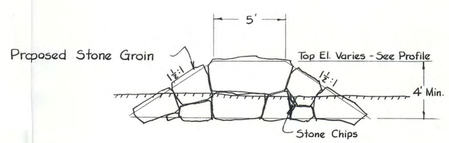
PLAN

SCALE 1"=20'



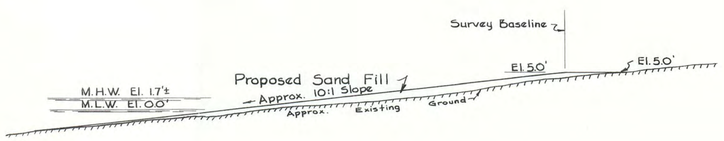
TYPICAL PROFILE OF GROINS

SCALE 1"=10'



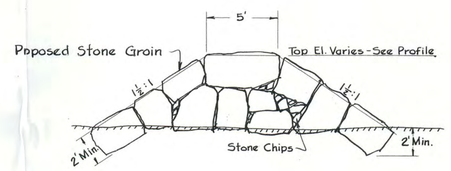
SECTION A-A

SCALE 1"=5'



TYPICAL SECTION THRU SAND FILL

SCALE 1"=10'



SECTION B-B

SCALE 1"=5'

NOTES -

1. Elevations are in feet and tenths and refer to the plane of mean low water.
2. Minus figures indicate depths below that plane.
3. Refer to transit book no. 958.

LOCATION OF PROPOSED WORK SHOWN IN RED.

PROPOSED SHORE PROTECTION
STONE GROINS & SAND FILL

VICINITY OF ATLANTIC AVENUE
EAST CHOP, OAK BLUFFS

PLAN & DETAILS

PREPARED FOR THE DIVISION OF WATERWAYS
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS BY
WALTER E. ROWLEY & ASSOCIATES, W. WAREHAM, MASS.

COMMONWEALTH OF MASSACHUSETTS — ROBERT A. BRANAN — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY K.E.S.
TRACED BY M.C.W.
DPW REVIEW :
BY F.C.S. DATE 11/61

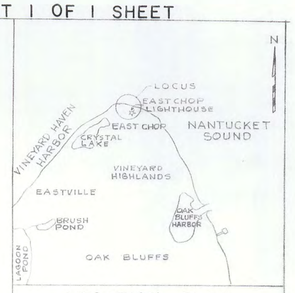
Robert B. MacDonnon
CHIEF WATERWAYS ENGINEER

John D. Bradford
DIRECTOR

JUNE 1961	CONTRACT # 2316	ACCESSION # 04287

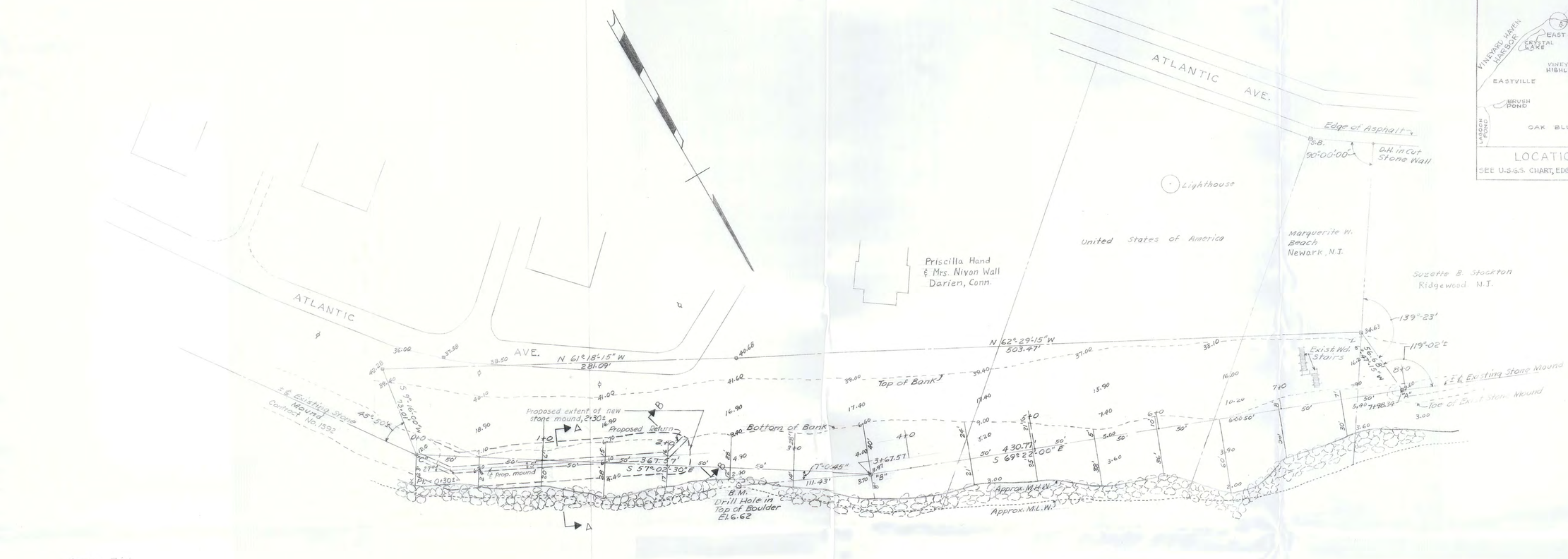
Reviewed Nov 1961 F.C.S.

SHEET 1 OF 1 SHEET



LOCATION PLAN

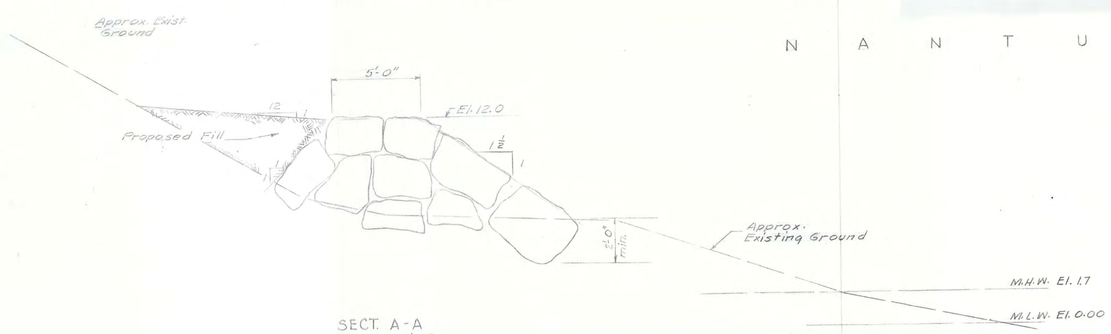
SEE U.S.G.S. CHART, EDGARTOWN QUAD. SCALE: 1/80



PLAN

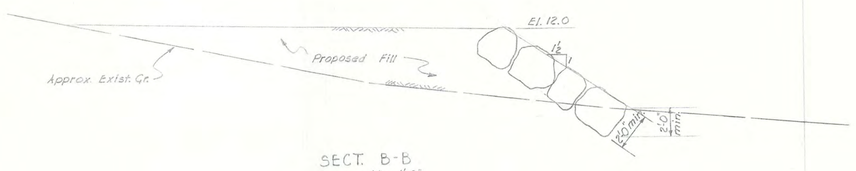
Scale: 1" = 40'

Elevations Are in Feet & Tenths Above the Plane of Mean Low Water



SECT. A-A

Scale ¼" = 1'-0"



SECT. B-B

Scale ¼" = 1'-0"

Note:
Location of proposed work shown in red
Ref.-Field Book No. 685
Survey Sept. 1958

PROPOSED SHORE PROTECTION
STONE MOUND CONSTRUCTION

EAST CHOP

VINEYARD HIGHLANDS, OAK BLUFFS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS

APRIL, 1960

SCALES AS SHOWN

Prepared by:
COMMONWEALTH CORPORATION,
BOSTON, MASS.

CHIEF WATERWAYS ENGINEER

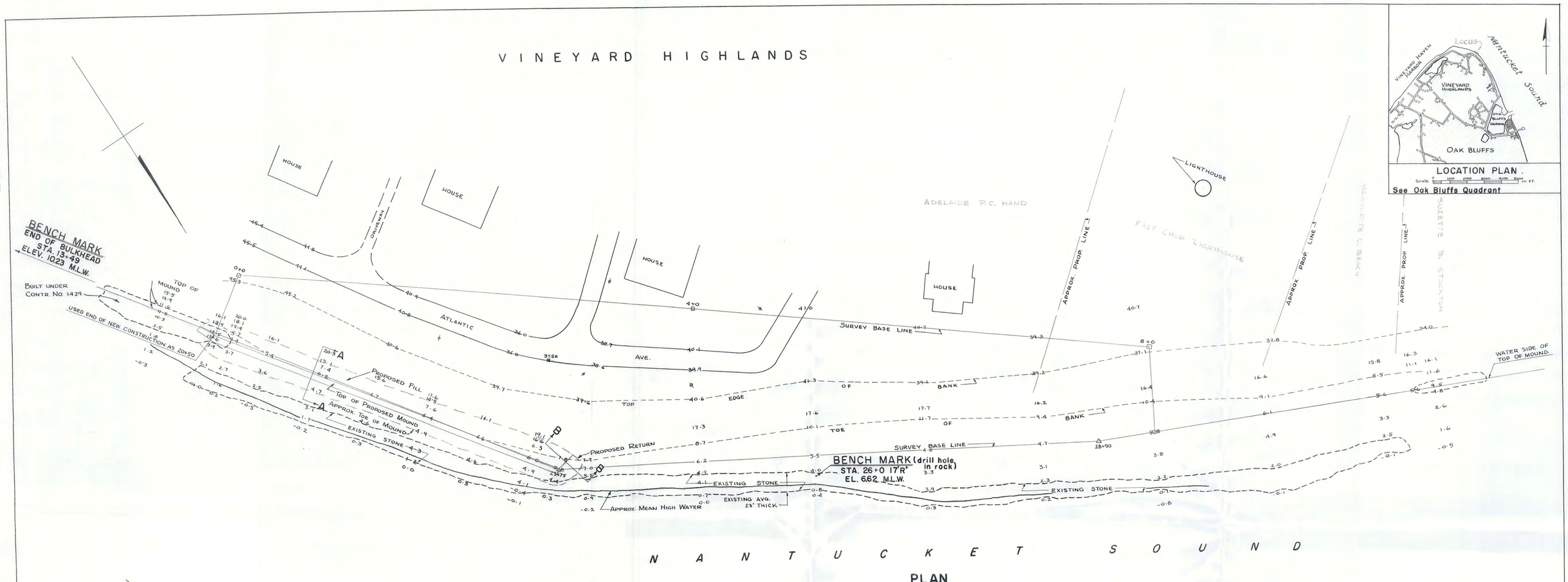
CONTRACT NO. 2130

ACC. NO. 04125

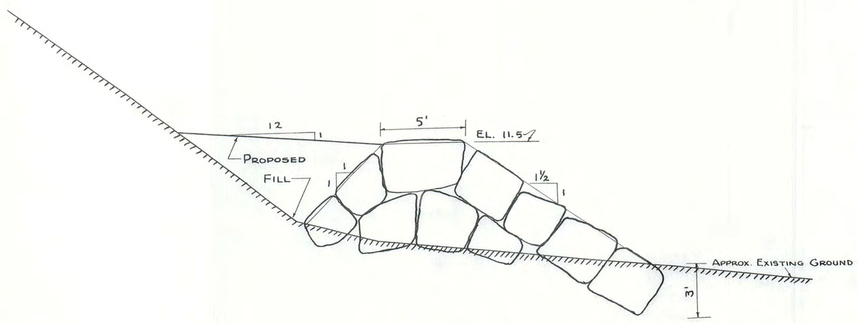
Reviewed by F.C.S. 7/60

K0200

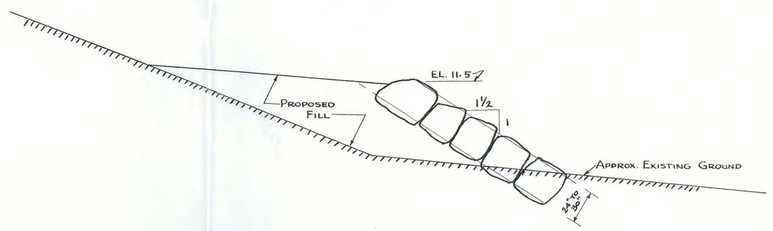
K0200



PLAN
SCALE: 1"=40'



SECTION A-A
SCALE 1"=4'



SECTION B-B
SCALE 1"=4'

NOTE:
ELEVATIONS ARE IN FEET AND TENTHS ABOVE THE PLANE OF MEAN LOW WATER. MINUS FIGURES SHOW DEPTH BELOW SAME PLANE.
REFERENCE: TRANSIT BOOK NO. 685
SURVEY MADE BY: W.E. ROWLEY, CONSULTING ENGR.

LOCATION OF PROPOSED WORK SHOWN IN RED

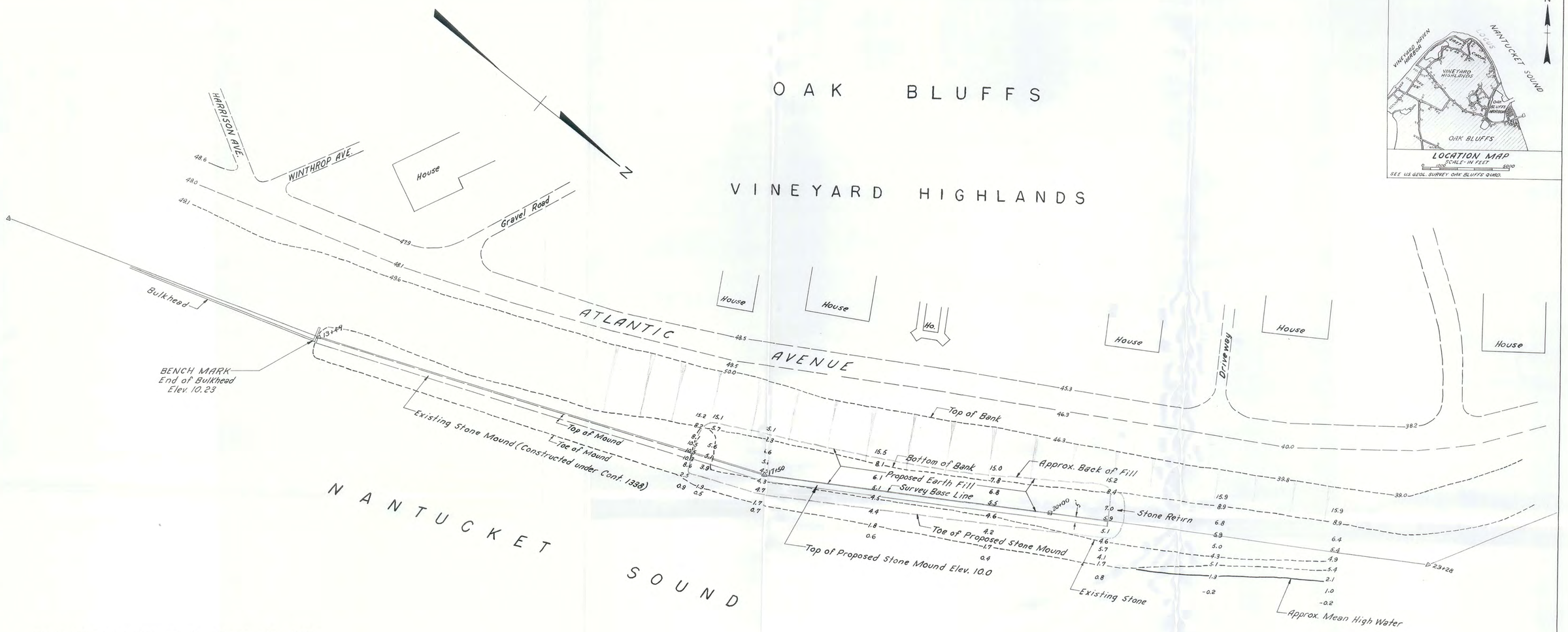
PROPOSED SHORE PROTECTION
STONE MOUND CONSTRUCTION
VINEYARD HIGHLANDS
OAK BLUFFS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
MARCH 1956
SCALE: AS SHOWN

Robert A. MacLennan
DISTRICT WATERWAYS ENGINEER

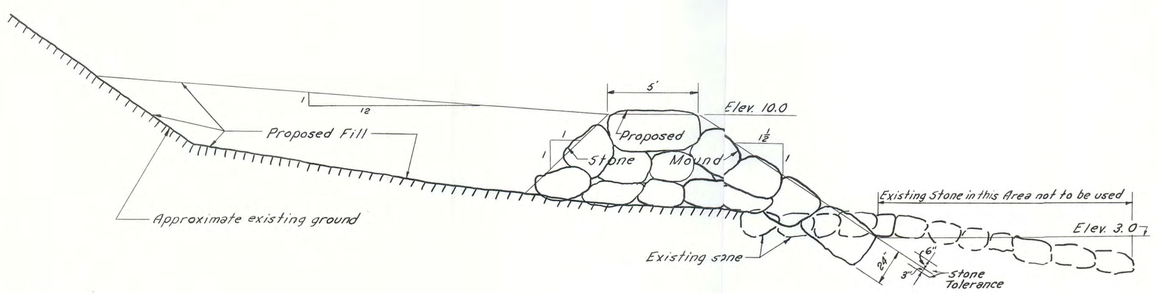
CONTRACT NO. 1592

ACC. 03522



PROPOSED WORK SHOWN IN RED

PLAN
SCALE 1" = 40'



TYPICAL SECTION
SCALE 1" = 4'

NOTE

Elevations are in feet and tenths above the plane of mean low water. Minus figures show depths below the same. Reference: Transit Book No. 582

PROPOSED SHORE PROTECTION
STONE MOUND CONSTRUCTION
VINEYARD HIGHLANDS
OAK BLUFFS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS

SEPTEMBER 1954

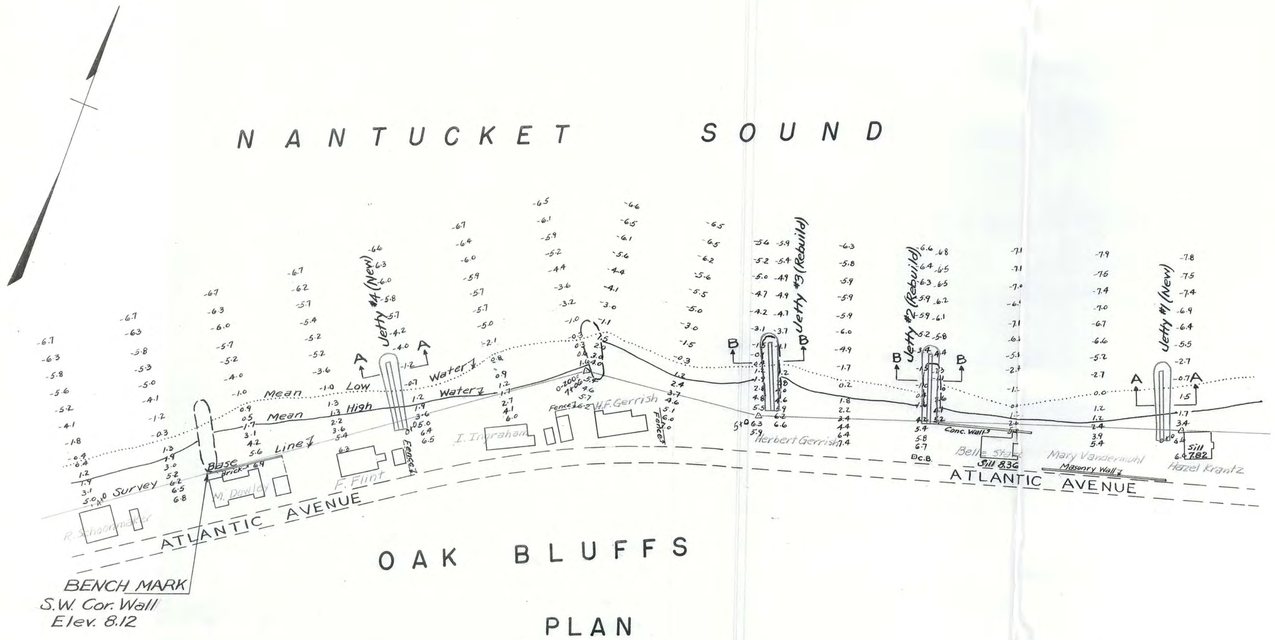
SCALE: AS SHOWN

Robert A. MacGinnon
DISTRICT WATERWAYS ENGINEER

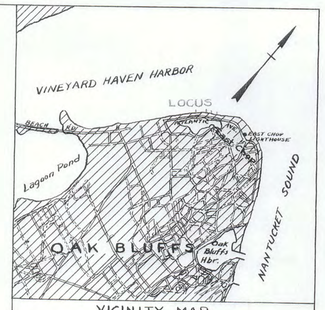
CONTRACT NO. 1429

ACC. 03289

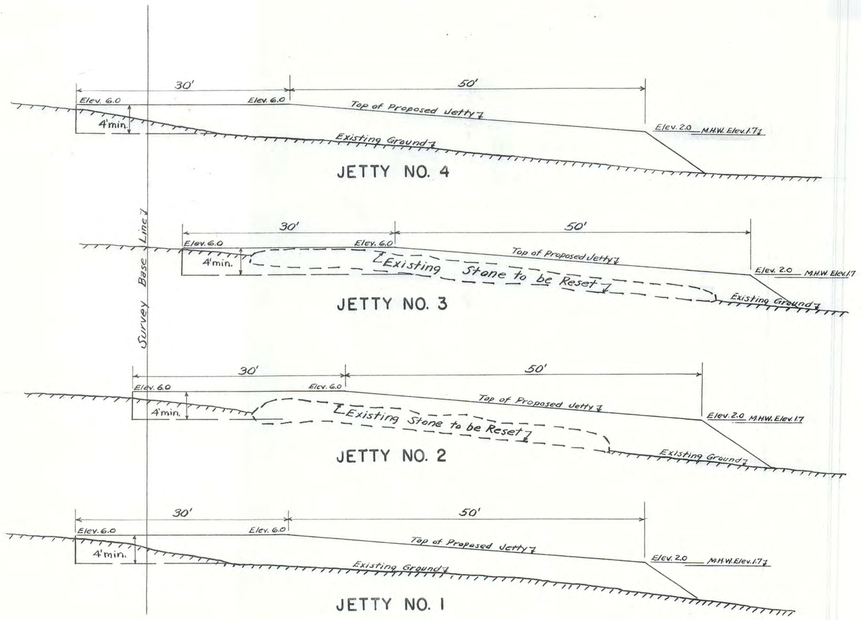
K030



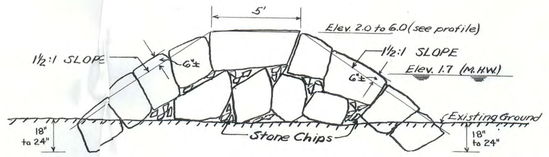
PLAN
SCALE 1:1000



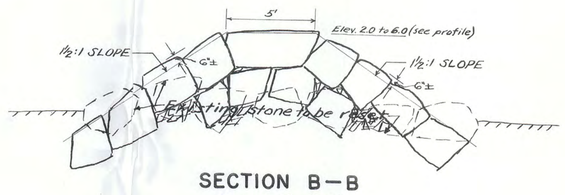
VICINITY MAP
SCALE: IN FEET
SEE: EDGARTOWN QUADRANGLE
SCALE 1:31680



PROFILES OF PROPOSED JETTIES
SCALE 1" = 10'



SECTION A—A
SCALE ¼" = 1'-0"



SECTION B—B
SCALE ¼" = 1'-0"

PROPOSED WORK SHOWN IN RED

NOTE

Elevations are in Feet and Tenths and refer to the Plane of Mean Low Water. Minus Figures show depths below the same.
Reference: Transit Book Nos. 379 & 533

PROPOSED STONE JETTIES
EAST CHOP
OAK BLUFFS

DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS
JANUARY 1952
SCALE: AS SHOWN

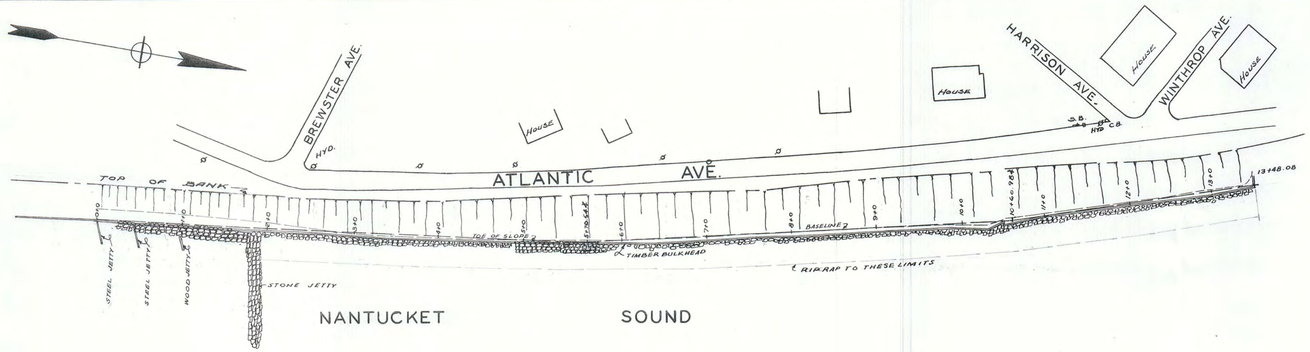
DISTRICT WATERWAYS ENGINEER

CONTRACT NO. 1193
ACC. 02923

K0200

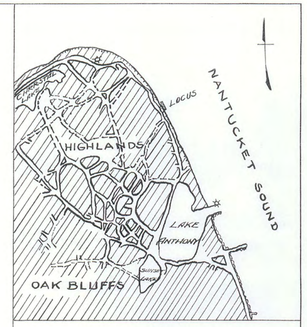
K0200

KO 200



PLAN

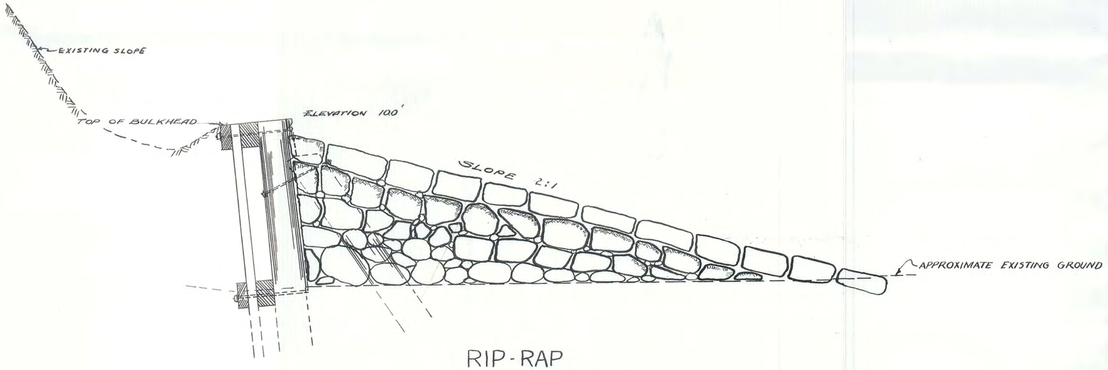
SCALE 1" = 1000'



KEY MAP

SCALE 1" = 20000

SEE U.S.C. & G.S. CHART NO. 346



RIP-RAP

TYPICAL SECTION

NOT TO SCALE

SHORE PROTECTION
EAST CHOP BULKHEAD REVETMENT
OAK BLUFFS
HIGHLANDS

PREPARED FOR
DEPARTMENT OF PUBLIC WORKS OF MASSACHUSETTS
DIVISION OF WATERWAYS

PLAN AND SECTION

DUFFILL ASSOCIATES, INC. 80 BOYLSTON ST.		CONSULTING ENGINEERS BOSTON MASS.
DATE JUNE 1952		DISTRICT WATERWAYS ENG.
SHEET 1 OF 1	CONTRACT NO. 1244	ACC. - 02982

KO 200

EXHIBIT F

State Register of Historic Places (MACRIS Results)

Massachusetts Cultural Resource Information System
MACRIS

MHC Home | MACRIS Home

Results

Get Results in Report Format
PDF Spreadsheet

Below are the results of your search, using the following search criteria:
Town(s): Oak Bluffs
Place: East Chop
Street Name: east chop Dr
Resource Type(s): Area, Building, Burial Ground, Structure, Object

For more information about this page and how to use it, click here

Inv. No.	Property Name	Street	Town	Year	SR			
OAK.415	Banfield, Julia D. House	94 East Chop Dr	Oak Bluffs	1888			INV	
OAK.420	Howes, Abbie M. House	108 East Chop Dr	Oak Bluffs	1885			INV	
OAK.343	Raymond, E. H. House	144 East Chop Dr	Oak Bluffs	1888			INV	
OAK.344	Davis, Lucy M. House	150 East Chop Dr	Oak Bluffs	1888			INV	
OAK.345	Ferris, F. A. House	154 East Chop Dr	Oak Bluffs	1890			INV	
OAK.356	Smith, Eleanore House	172 East Chop Dr	Oak Bluffs	1912			INV	
OAK.355	Merriam, Samuel House	176 East Chop Dr	Oak Bluffs	1877			INV	
OAK.354	Taylor, E. G. House	180 East Chop Dr	Oak Bluffs	1879			INV	
OAK.353	Elliott, Samuel T. House	186 East Chop Dr	Oak Bluffs	c 1917			INV	
OAK.350	Fuller, Melville B. House	194 East Chop Dr	Oak Bluffs	1911			INV	
OAK.349	Davis, W. B. W. House	202 East Chop Dr	Oak Bluffs	1890			INV	
OAK.357	Hand, Adelaide House	221 East Chop Dr	Oak Bluffs	1909			INV	
OAK.900	East Chop Light	231 East Chop Dr	Oak Bluffs	1876	SR		INV	NR
OAK.336	Newton, John F. House	233 East Chop Dr	Oak Bluffs	1872			INV	
OAK.335	Ward, Ann J. House	239 East Chop Dr	Oak Bluffs	c 1900			INV	

Page 1 of 2 Next 15

EXHIBIT G

Geotechnical Design Report (by JCK Underground)

March 23, 2017

Carlos G. Peña, P.E.
CLE Engineering, Inc.
15 Creek Road
Marion, MA 02738
cpena@cleengineering.com

Re: East Chop Drive Coastal Bank – Preliminary Design Review

Dear Carlos,

As a follow up to the Condition Update Report provided to CLE Engineering by JCK Underground (JCK) on March 10, 2017, the following provides comments/input on the preliminary design of the bluff repair. Our comments are based on the review of the preliminary drawings titled East Chop Bluff Repair, Plan View, Sections, and Details, dated 01/20/17 included as Attachment A:

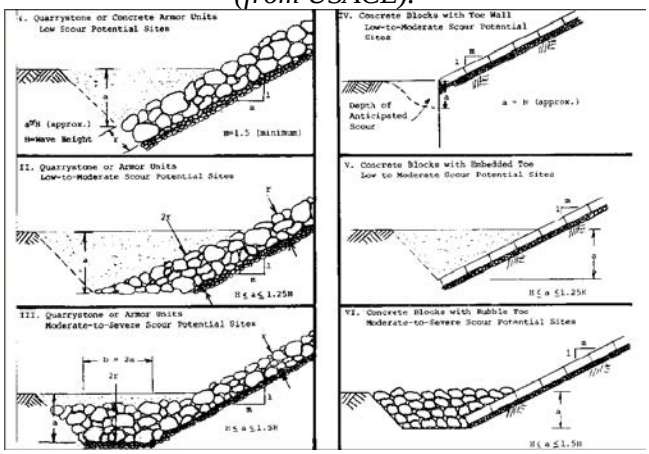
1. Stone Revetment

    a. The slope of the stone revetment is consistent with large angular armor stone that are set into place. Set stone is more labor intensive then dumped riprap, but can achieve a higher slope angle. When constructed properly, large angular stones can typically be used for slopes as steep as 1 Vertical to 1.5 Horizontal (1V:1.5H).

    b. If dumped riprap is used for the revetment, we recommend flattening the maximum slope to 1V:2H, which is consistent to guidelines provided in U.S. Army Corp of Engineering Manual 110-2-1614, Design of Coastal Revetments, Seawalls and Bulkheads, 1995 (hereafter USACE).

    c. The design is consistent with revetments used for Condition I "Low Scour Potential Sites", as shown in Figure 2-4 (below) taken from USACE. Please note that the embedment ("a") of the riprap is related to the wave height ("H").

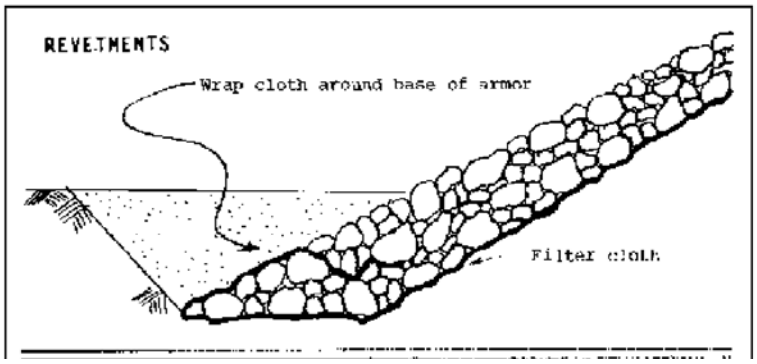
Figure 2-4. Revetment Toe Protection (Designs I through VI) (from USACE).



d. Construction will require excavating sands beneath the mud-line, and we expect these materials will not hold a steep angle of repose. We recommend planning to extend the upper surface of the riprap toe further out, as shown in the figure above for Condition II "Low to Moderate Scour Potential Sites".

e. We recommend wrapping the filter fabric over the top of the riprap as follows:

Figure 2-8. Use of Filter Cloth Under Revetment and Toe Protection Stone (from USACE).



f. The final design should include using manufacturer recommended overlaps between strips of filter fabric.

g. We agree with the use of a 1-foot thick layer of filter stone placed on top of the filter fabric.

h. The thickness of the revetment, measured perpendicular to the slope, should be:

i. At least twice the nominal diameter of the W_{50} stone ($D = (W/\gamma)^{1/3}$), where W is the weight of the stone in pounds and γ (or γ_r) is the unit weight of the stone (typically 160 pounds per cubic foot).

ii. At least 25 percent greater than the nominal diameter of the largest stone

iii. $$r_{\min} = \max\left[2.0\left(\frac{W_{50\min}}{\gamma_r}\right)^{1/3},\quad 1.25\left(\frac{W_{100}}{\gamma_r}\right)^{1/3},\quad 1\ ft \right]$$

i. We did not check the size of the stone, but it should be sized in accordance to the wave height and the slope of the revetment.

j. The Access Ramp Detail on Sheet 4 labels the 3 foot thick middle layer of quarried granite as "800-120 LB STONES". Please revise the 120 to 1200. The note shall read "3' THICK LAYER OF 800-1200 LB STONES".

k. Sufficient free board should be added to the height of the revetment to preclude overtopping events from occurring.

2. Upper Slope Recommendations

    a. Assuming the upper slope is constructed in compacted lifts using sands like what exists on the site, we recommend a using 1V:2.3H slope. This recommendation is based on a factor of safety of 1.5 for permanent slopes, as suggested by NAVFAC DM 7.1, Chapter 7, Section 5, page 7.1-329.

    b. Slopes as steep as 1V:2H are possible using well graded fill material, however short term stability will be depend on the slope being protected from storm erosion.

    c. The long-term stability of the slope is dependent on the prevention of foot traffic from accessing the slope and the establishment of erosion-resistant vegetation.

    d. The upper slope must also be protected from surface water runoff. Runoff should be redirected away from the slope or collected and piped through the slope and discharged onto the revetment slope.

    e. The foundations supporting the ADA ramp should be designed such that the weight bearing portion of the foundation extends below the freeze line.

If you have any questions or concerns, please e-mail me at Kantola@JCKUnderground.com or call me directly at (857) 294-1317.

Sincerely,

JCK Underground

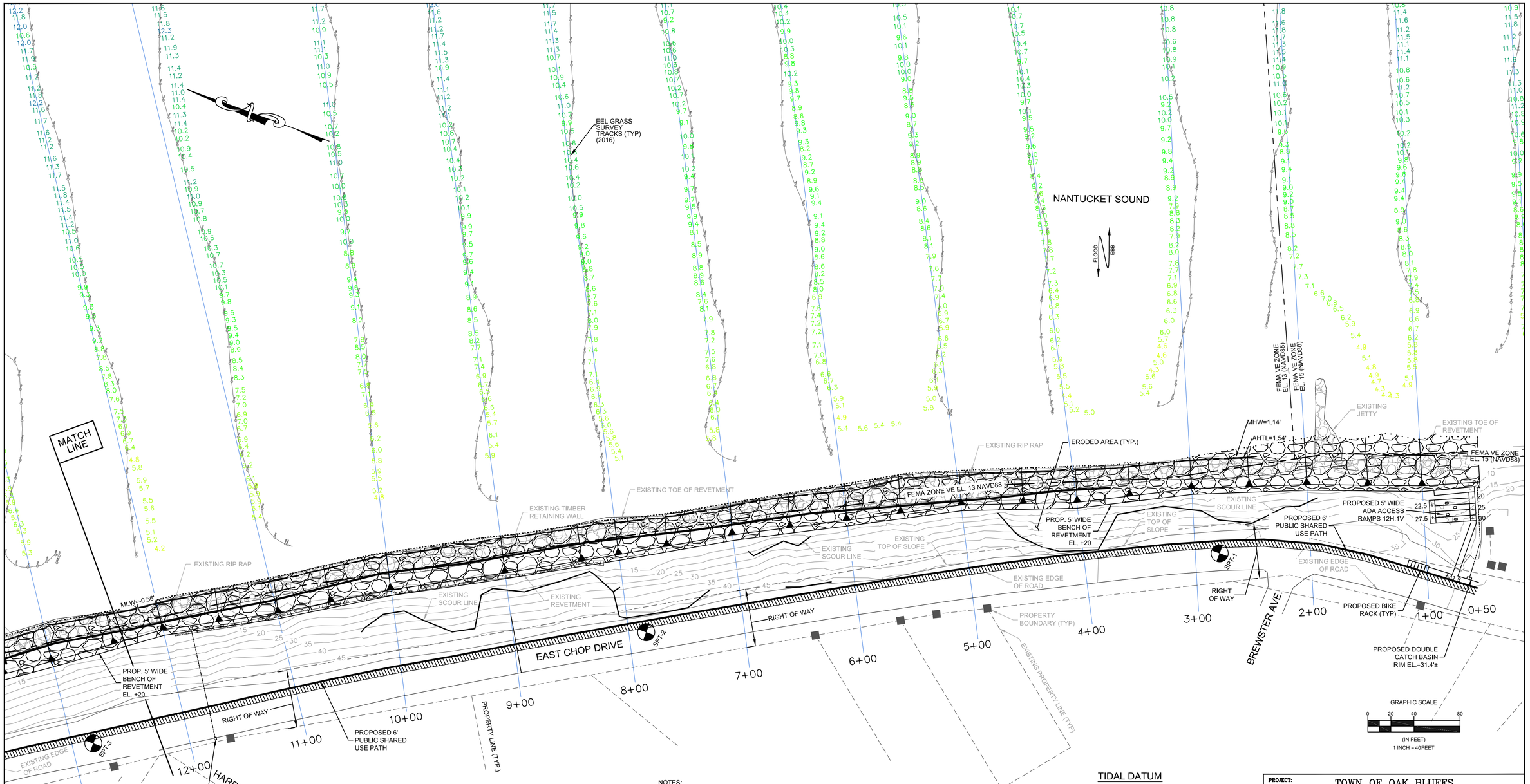
Joel Kantola, PE
Principal

Attachments:

Attachment A: East Chop Bluff Repair, CLE Engineering, Sheets 1 through 4, dated 1/20/17/

Attachment A:

East Chop Bluff Repair, CLE Engineering, Sheets 1 through 4, dated 1/20/17



SURVEY NOTES:

1. PROJECT NAME:	HYDROGRAPHIC SURVEY
2. PROJECT NUMBER:	09027.300 & 13021.300
3. PLOT SCALE:	1"=40'
4. SURVEY DATE:	SEPTEMBER 14, 2016
5. SURVEYOR:	M.COUNT, J. BARANELLO
6. VESSEL:	"OLAF"
7. TRANS./FATH.:	200KHZ, 4 DEGREE ODOM CVM
8. WEATHER COND:	SUNNY, 60 DEGREES, WIND LIGHT, SEAS CALM
9. PROJECT DATUM:	NGVD29
10. COOR. SYSTEM:	NAD-83, MA-2001 MASS ISLAND
11. DATA REDUCTION:	DATA SORTED WITH 10' RADIUS
12. BENCHMARK:	BENCHMARK NO. 1 EL. +14.85' NGVD29

NOTES:

1. RESULTS OF TOPOGRAPHIC SURVEY BY CLE ENGINEERING, INC. (CLE) ON 9/9, 9/15, 9/21,11/10, AND 11/11/2016.
2. RESULTS OF HYDROGRAPHIC SURVEY BY CLE ON 9/14/2016.
3. EEL GRASS INSPECTION BY CLE ENGINEERING, INC. (CLE) ON 9/16/2016.
4. EEL GRASS INSPECTION CONFIRMED THERE IS NO EEL GRASS IN THE SCOPE OF WORK.
5. ELEVATIONS AND SOUNDINGS ARE IN FEET AND TENTHS, AND REFER TO THE NGVD29 DATUM. AHTL=+1.54'.
6. DATUM CONVERSIONS PERFORMED USING NOAA BM DISK NO. 1 SET IN ROCK AT BUS STATION.
7. COORDINATES ARE BASED ON NAD83 MASSACHUSETTS ISLAND STATE PLANE GRID SYSTEM.
8. SOUNDINGS ARE BASED ON THE 5' MINIMUM VALUE DATA SET FOR MAPPING.
9. PROJECT BENCHMARK IS NOAA DISK "BM NO.1". BENCHMARK ELEVATION IS +14.85' NGVD29 SET IN ROCK AT BUS STATION NEAR OAK BLUFFS FERRY TERMINAL.
10. PROPERTY LINES FOR EAST CHOP PROVIDED BY REID & SILVA ON PLAN DATED 5/29/13.
11. FERRY TERMINAL LIMITS ARE APPROXIMATE AND WERE SCALED FROM GOOGLE EARTH AERIAL IMAGERY.
12. PROJECT SITE IS IN FEMA ZONE VE EL. +13 NAVD88 (EL. +14.3 NGVD29) & VE EL. 15' NAVD88 (EL. +16.3 NGVD29) IN ACCORDANCE TO MOST RECENT FEMA FIRM #25007C0108J, EFFECTIVE DATE JULY 20, 2016.
13. POSSESSION AND USE OF THE MATERIAL CONTAINED ON THESE DRAWINGS IS GRANTED ONLY IN CONNECTION WITH ITS USE AS IT RELATES TO THE TITLED PROJECT, ANY OTHER USE, REPRODUCTION OR DISCLOSURE OF THE INFORMATION CONTAINED HEREON IS EXPRESSLY PROHIBITED WITHOUT THE WRITTEN CONSENT OF CLE ENGINEERING INC.

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TIDAL DATUM

NGVD29		MLW
1.54	2.1	ANNUAL HIGHEST TIDE (2017)
1.14	1.70	M.H.W.
0.00	0.56	NGVD29
-0.56	0.00	M.L.W.

TIDAL OFFSETS FROM NOAA TIDE STATION OAK BLUFFS #8448208 AND VDATUM V3.5

PROJECT: TOWN OF OAK BLUFFS EAST CHOP BLUFF

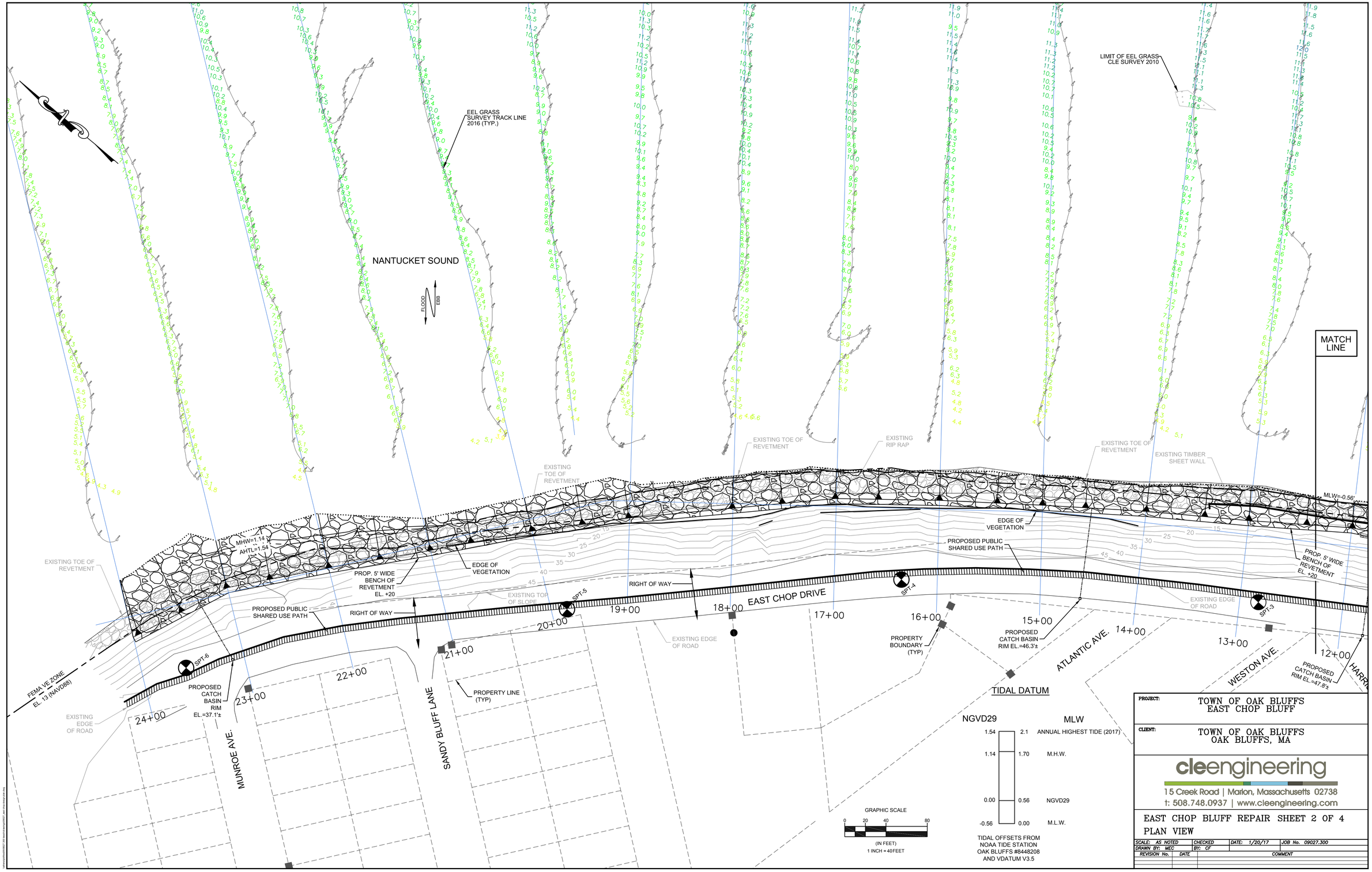
CLIENT: TOWN OF OAK BLUFFS OAK BLUFFS, MA

cleengineering
15 Creek Road | Marion, Massachusetts 02738
t: 508.748.0937 | www.cleengineering.com

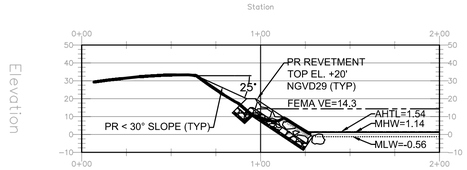
EAST CHOP BLUFF REPAIR SHEET 1 OF 4
PLAN VIEW

SCALE: AS NOTED	CHECKED	DATE: 1/20/17	JOB No. 09027.300
DRAWN BY: MEC	BY: CF		

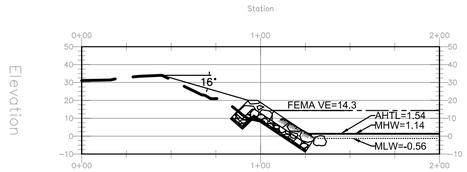
REVISION No.	DATE	COMMENT


EEL GRASS SURVEY TRACK LINE 2016 (TYP.)
LIMIT OF EEL GRASS CLE SURVEY 2010
NANTUCKET SOUND
FLOOD
EBB
MATCH LINE
EXISTING TOE OF REVETMENT
EXISTING RIP RAP
EXISTING TIMBER SHEET WALL
MLW=-0.56'
MHW=1.14'
AHTL=1.54'
EDGE OF VEGETATION
PROPOSED PUBLIC SHARED USE PATH
PROP. 5' WIDE BENCH OF REVETMENT EL. +20
RIGHT OF WAY
EXISTING TOP OF SLOPE
EAST CHOP DRIVE
EXISTING EDGE OF ROAD
PROPERTY BOUNDARY (TYP)
PROPOSED CATCH BASIN RIM EL.=46.3'±
PROPOSED CATCH BASIN RIM EL.=47.8'±
PROPOSED CATCH BASIN RIM EL.=37.1'±
PROPERTY LINE (TYP)
FEMA VE ZONE EL. 13 (NAVD88)
SPT-3
SPT-4
SPT-5
SPT-6
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
ATLANTIC AVE.
WESTON AVE.
MUNROE AVE.
SANDY BLUFF LANE
TIDAL DATUM
NGVD29
MLW
1.54 2.1 ANNUAL HIGHEST TIDE (2017)
1.14 1.70 M.H.W.
0.00 0.56 NGVD29
-0.56 0.00 M.L.W.
TIDAL OFFSETS FROM NOAA TIDE STATION OAK BLUFFS #8448208 AND VDATUM V3.5
GRAPHIC SCALE
0 20 40 80
(IN FEET)
1 INCH = 40FEET
PROJECT: TOWN OF OAK BLUFFS EAST CHOP BLUFF
CLIENT: TOWN OF OAK BLUFFS OAK BLUFFS, MA
cleengineering
15 Creek Road | Marion, Massachusetts 02738
t: 508.748.0937 | www.cleengineering.com
EAST CHOP BLUFF REPAIR SHEET 2 OF 4
PLAN VIEW
SCALE: AS NOTED
CHECKED
DATE: 1/20/17
JOB No. 09027.300
DRAWN BY: MEC
BY: CF
REVISION No.
DATE
COMMENT

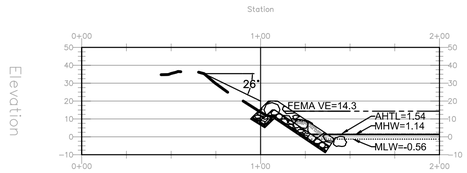
SECTION STATION 0+50



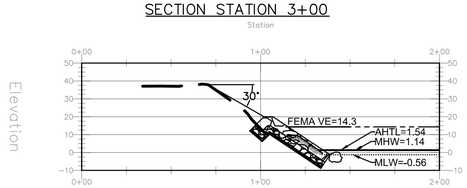
SECTION STATION 1+00



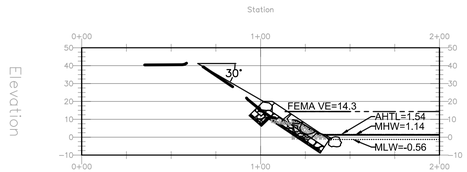
SECTION STATION 2+00



SECTION STATION 3+00



SECTION STATION 4+00



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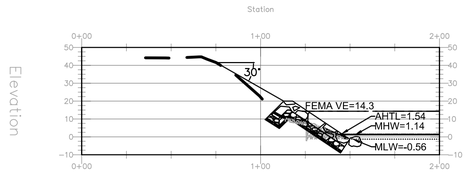

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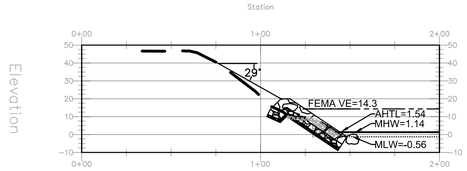

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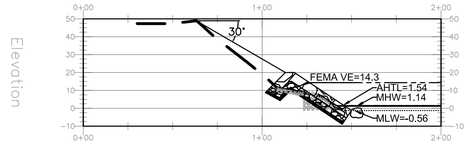

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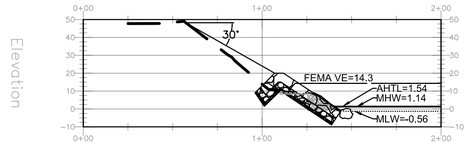

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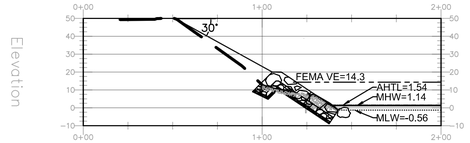

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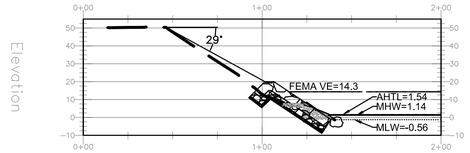

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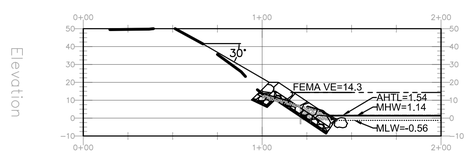

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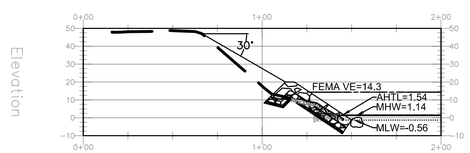

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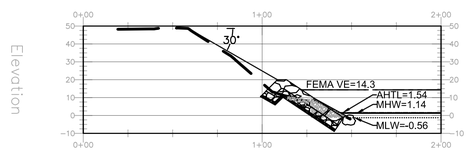

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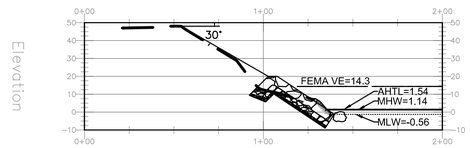

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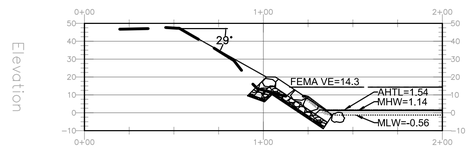

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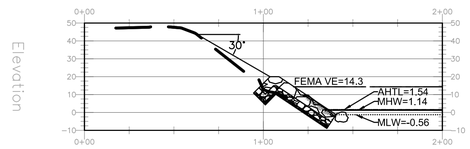

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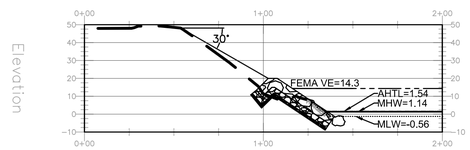

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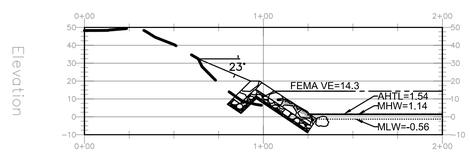

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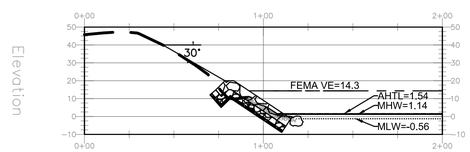

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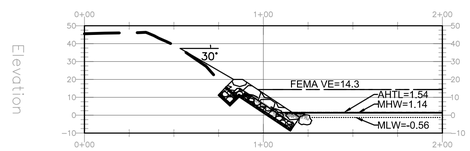

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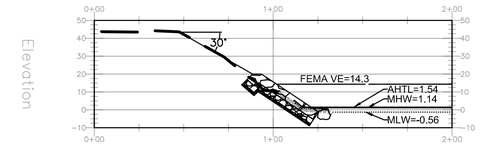

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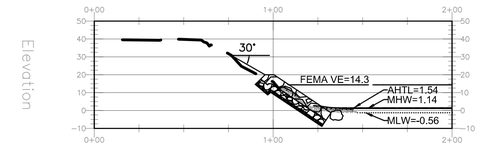

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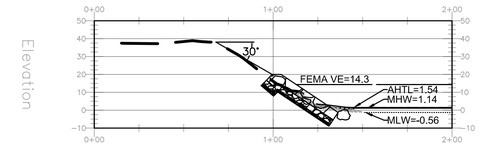

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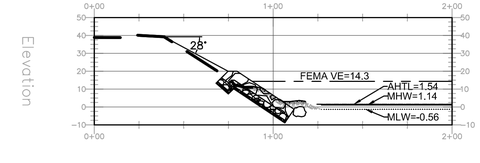


GRAPHIC SCALE

0 20 40 80

(IN FEET)
1 INCH = 40FEET

PROJECT: TOWN OF OAK BLUFFS
EAST CHOP BLUFF

CLIENT: TOWN OF OAK BLUFFS
OAK BLUFFS, MA

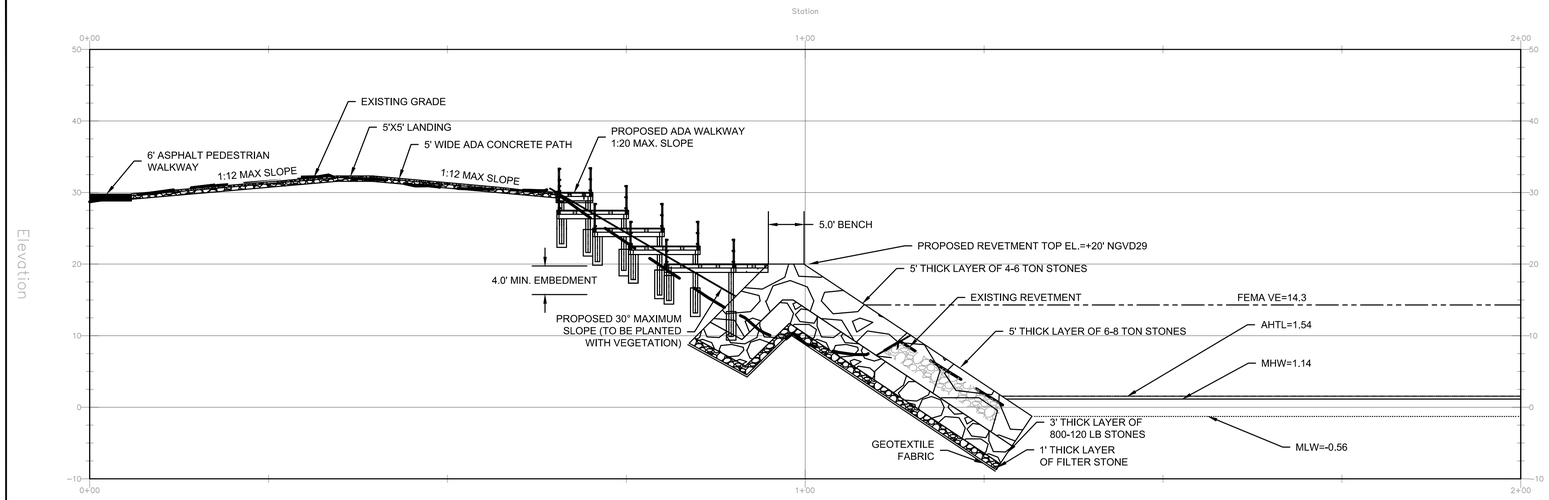
cleengineering
15 Creek Road | Marion, Massachusetts 02738
t: 508.748.0937 | www.cleengineering.com

EAST CHOP BLUFF REPAIR SHEET 3 OF 4
SECTIONS

SCALE: AS NOTED	CHECKED	DATE: 1/20/17	JOB No. 09027.300
DRAWN BY: MEC	BY: CF		

REVISION No.	DATE	COMMENT

PROFILE STA 0+54.8

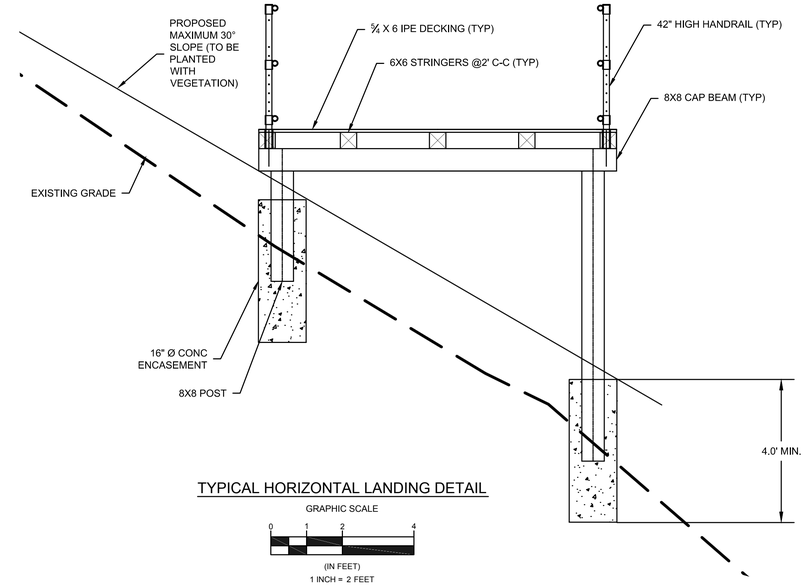


ACCESS RAMP DETAIL

GRAPHIC SCALE

0 10 20 40

(IN FEET)
1 INCH = 20FEET

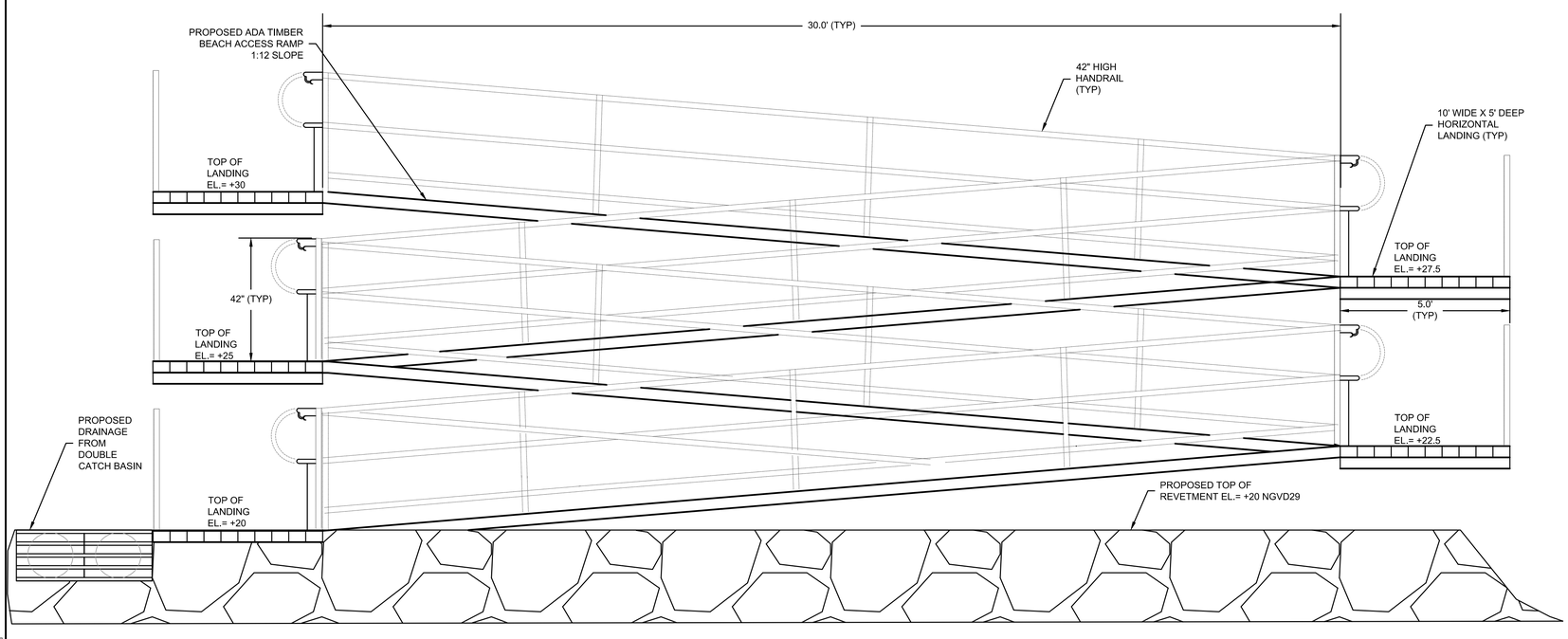


TYPICAL HORIZONTAL LANDING DETAIL

GRAPHIC SCALE

0 1 2 4

(IN FEET)
1 INCH = 2 FEET

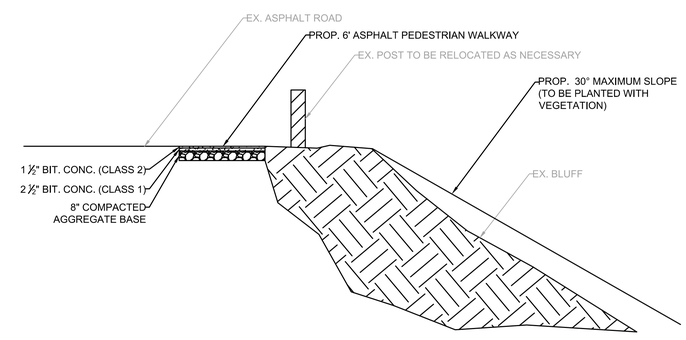


ACCESS RAMP PROFILE

GRAPHIC SCALE

0 1 2 4

(IN FEET)
1 INCH = 2 FEET



PEDESTRIAN WALKWAY DETAIL

GRAPHIC SCALE

0 2.5 5 10

(IN FEET)
1 INCH = 5 FEET

PROJECT: TOWN OF OAK BLUFFS
EAST CHOP BLUFF

CLIENT: TOWN OF OAK BLUFFS
OAK BLUFFS, MA

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EAST CHOP BLUFF REPAIR SHEET 4 OF 4
DETAILS

SCALE: AS NOTED	CHECKED	DATE: 1/20/17	JOB No. 09027.300
DRAWN BY: MEC	BY: CF		

REVISION No.	DATE	COMMENT

EXHIBIT H

Wave Run-up Analysis Calculations

EXHIBIT I

Site Photographs

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Site Photographs

Photo 1: Station 3+00 Looking Northwest (Erosion)

Photo 2: Station 8+50 Looking Southeast (Erosion)

Photo 3: Station 9+00 Looking Northwest (Erosion)

Photo 4: Station 11+00 Looking Southeast (Erosion)

Photo 5: Station 11+50 Looking Southeast (Erosion)

Photo 6: Station 11+50 Looking East (Damaged drain pipe)

Photo 7: Station 13+50 Looking Southeast

Photo 8: Station 17+00 Looking Southeast (Erosion)