Final Supplemental Environmental Assessment

Town of Oak Bluffs Resilient Infrastructure for East Chop Drive

Town of Oak Bluffs, Dukes County, Massachusetts

PDMC-PJ-01-MA-2018-001

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FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency, Region I
99 High Street, Sixth Floor
Boston, MA 02110

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ACRONYMS

ADA	Americans with Disabilities Act
BMP	Best Management Practice
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DCR	Massachusetts Department of Conservation and Recreation
EA	Environmental Assessment
EAB	Emerald Ash Borer
EFH	Essential Fish Habitat
EGM	European Gypsy Moth
EO	Executive Order
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
HTL	High Tide Line
ILF	In-lieu Fee
IPaC	Information for Planning and Consultation
MA CZM	Massachusetts Office of Coastal Zone Management
MADEP	Massachusetts Department of Environmental Protection
MDAR	Massachusetts Department of Agricultural Resources
MIPAG	Massachusetts Invasive Plant Advisory Group
NEPA	National Environmental Policy Act
NHESP	Massachusetts Natural Heritage and Endangered Species Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PDM	Pre-Disaster Mitigation Grant
SEA	Supplemental Environmental Assessment
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

The Massachusetts Emergency Management Agency submitted to the Federal Emergency Management Agency (FEMA) a Pre-Disaster Mitigation (PDM) grant application on the behalf of the Town of Oak Bluffs (Town). The PDM Grant Program is authorized under Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 United States Code (U.S.C.) 5133. Under the PDM grant program, FEMA may provide technical and financial assistance to states and local governments to assist in the implementation of pre-disaster hazard mitigation measures that are cost-effective and are designed to reduce injuries, loss of life, and damage and destruction of property, including damage to critical services and facilities resulting from natural disasters.

The Proposed Action would stabilize and improve 1,200 linear feet of a failing coastal revetment along East Chop Bluff. The revetment experienced erosion that has undermined the existing road, East Chop Drive, to the point of imminent failure.

The National Environmental Policy Act (NEPA) requires FEMA to consider potential environmental effects before funding or approving actions and projects and to ensure that the public is fully informed about the potential consequences of a proposed federal action. The United States Army Corps of Engineers (USACE) completed an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI) on January 21, 2020, for this project. USACE issued a permit to the town under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403) and Section 404 of the Clean Water Act (CWA) (33 U.S.C. § 1344) (USACE file number NAE 2017-01616) on January 21, 2020. The project reviewed in the USACE EA included 2,400 linear feet of revetment work from the toe of the revetment up to the high tide line (HTL). The work proposed for funding under the FEMA grant would include the southern 1,200 linear feet of the area reviewed by USACE and would also include work above the HTL up to the western side of East Chop Drive.

FEMA is proposing to adopt the USACE EA in accordance with Title 40 Code of Federal Regulations (C.F.R.) 1506.3(c) because the actions covered by the original environmental assessment and the Proposed Action are substantially the same below the HTL. Because the project proposed for funding under the PDM grant program encompasses a larger area than considered in the USACE EA, FEMA has prepared this Supplemental Environmental Assessment (SEA) to evaluate the potential effects of the Proposed Action and alternatives that were not analyzed in the USACE EA. FEMA will use the findings in this final SEA to determine whether to prepare an environmental impact statement or to issue a FONSI.

2.0 PURPOSE AND NEED

The purpose of the proposed PDM project is to reduce erosion hazards along East Chop Bluff. The existing revetment is failing due to continued erosion caused by wave and storm surge action. Continued erosion has deteriorated the existing revetment and reduced the vegetation on the bluff, thus destabilizing the slope and posing a threat to nearby residential homes. Additionally, because the roadbed is undermined by the continued erosion, East Chop Drive is currently closed, affecting evacuation routes and emergency response.

3.0 PROJECT LOCATION AND BACKGROUND

East Chop Bluff is located along the northeastern shoreline of Oak Bluffs in Dukes County, Massachusetts, and is owned by the Town (**Appendix A, Figure 1**). The project area commences near the intersection of Brewster Avenue and East Chop Drive to the south, extends approximately 1,200 linear feet north to the intersection of Harrison Avenue and East Chop Drive, and extends seaward into the Atlantic Ocean to encompass the existing revetment (**Appendix A, Figure 2**).

The project area consists of an engineered coastal bank with landside vegetation and is armored with a stone revetment along the bank toe and shoreline. The existing engineered bank and stone revetment was installed by the Commonwealth of Massachusetts in the late 1800s and was improved in the 1930s and 1960s. Severe weather and storms have significantly eroded East Chop Bluff and damaged the existing revetment to the point that it is considered in failing condition (CLE 2017). Erosion on the face of the upper slope is developing into horizontal cracks along the top of the bank, parallel to East Chop Drive (CLE 2017). In some areas, the bluff slope has steepened to near vertical and the top of the bank is eroding closer to the roadway (CLE 2017). Continued erosion of the bluff increases the risk to nearby residents from storm surges and has made East Chop Drive unsafe for vehicular use (FEMA 2000). The northbound (oceanside) lane has been closed to vehicular traffic since Hurricane Sandy in October 2012; heavy winter storms in 2018 caused the permanent closure of both lanes. This restricts residents' access to their homes, affects the ability of emergency service responders to effectively perform their duties, and affects access for utility maintenance/repair vehicles and tourists.

The Proposed Action would be the first of two phases to restore and improve the existing revetment. The second phase would extend north from the project area for an additional 1,200 linear feet along East Chop Bluff between Harrison Avenue at the south and Munroe Avenue to the north. The second phase would address a section of the bluff that is less eroded and where East Chop Drive remains open for vehicular use (it is not considered at-risk according to site inspections performed in 2019). The second phase would be an independent action and would be constructed after the first phase is completed. Each section of revetment would protect its associated section of bluff and East Chop Drive and is not dependent upon completion of the other section to provide erosion protection or meet the purpose of the project. The source of funding and timing of the second phase has not been determined.

4.0 ALTERNATIVES

NEPA regulations state that an agency must explore and objectively evaluate all reasonable alternatives, and for alternatives that were eliminated from detailed study, briefly discuss the reasons for their elimination (40 C.F.R. 1502.14). Additionally, a No Action alternative must be included. This section describes the No Action Alternative, the Proposed Action (that would provide for the purpose and need), and other alternatives that were considered but eliminated from the full analysis.

As described in **Section 1**, USACE completed an EA and a FONSI on January 21, 2020. As part of that EA, four alternatives were considered. Two alternatives were carried through in this SEA (see **Section 4.1** and **Section 4.2**) and two alternatives were dismissed. The alternatives that were dismissed are (1) maintaining the existing revetment footprint and (2) the installation of steel sheet piles and/or concrete walls. Because the dismissed alternatives were determined to be infeasible in the USACE EA (USACE 2019), they will not be analyzed in this SEA.

4.1 No Action Alternative

Under the No Action alternative, there would be no federal financial assistance provided to repair the existing coastal revetment. Severe weather conditions and storms would continue to erode the bluff within the project area, East Chop Drive would not be safe to reopen for vehicular traffic, and the continued erosion could lead to failure of the bluff, thus risking loss of infrastructure, utilities, and adjacent property. Eroded coastlines have a lower capacity to buffer against the storm surges associated with hurricanes, nor'easters, and other coastal storms, resulting in the greater vulnerability of populations living on the coast and increased risk of property and infrastructure damage or loss of life (FEMA 2000).

4.2 Proposed Action

Under the Proposed Action alternative, approximately 1,200 linear feet of the East Chop Bluff armored shoreline revetment would be reconstructed to account for future sea level rise, increased occurrence and intensity of storms, and to provide for a 50-year design life. The revetment would be extended both landward and seaward, increasing the footprint by 65 percent.

The revetment would be extended from approximately 9 to 24 feet beyond the HTL and would require placement of approximately 6,005 cubic yards of riprap material and 13,333 cubic yards of well-graded fill over a 15,180-square-foot area (below the HTL). Approximately 3,821 square feet of new fill would be placed seaward of the existing revetment footprint, between the mean high water line and the mean low water line, half of which would be landward of the HTL. There would also be an additional 622 cubic yards of fill and 160 cubic yards of crushed gravel placed for the southern temporary construction entrance. The expanded footprint would provide an adequate base for increasing the revetment height approximately 8 to 12 feet to +20 feet National Geodetic Vertical Datum 1929 (NGVD29), which is 5.7 feet above the 100-year flood elevation. The Proposed Action would reduce the existing revetment slope from a 34-degree grade to a 27-degree grade by regrading the bank. The bluff would be stabilized with well-graded fill and angular armor stones. The bluff above the stone revetment up to the East Chop Drive guardrail would be planted with native salt-tolerant vegetation, including beach rose (*Rosa rugosa*) and other native species, thus meeting the requirements of the Massachusetts Wetland Protection Act to add stability to the bluff and further reduce erosion. The revetment expansion and stabilization would result in approximately 105,545 square feet of ground disturbance.

A 12-foot-wide temporary construction access road would be built adjacent to and seaward of East Chop Drive and would be made of compacted crushed stone supported by sheet pile walls. The temporary road would be removed after project implementation. As part of the Proposed Action, the materials from the construction access road would be reused in a concrete path at the southern end of the project area that would extend 55 feet from the edge of East Chop Drive seaward to the top bench of the revetment. The path would be compliant with the Americans with Disabilities Act (ADA) and include a 5-foot ramp at the end to allow recreational access to fishing and swimming spots (location shown on page 1 of **Appendix B, Document 1**). The ramp would consist of aluminum and timber set at 1:12 slope with a 42-inch-tall handrail and would be supported by timber encased in concrete footings. The construction access road, redeveloped into the concrete path and ADA ramp, would result in approximately 8,680 square feet of ground disturbance.

Two existing drainage outfalls under East Chop Drive would be repaired, one outfall is approximately halfway between Harrison Avenue and Brewster Avenue and the second is at the intersection with Harrison Avenue. The work would include repairing drainage pipes and retrofitting the existing catch basins with proprietary treatment filters. Minor roadway repairs may occur around the catch basins, as necessary or as required, to fix potential road damage caused by construction.

Construction staging would be located along East Chop Drive. The contractor may need to secure additional space to stockpile materials, and such space would be located landward of the HTL on town-owned property. Access would be provided via the temporary construction access road. Equipment for the project would include backhoes, dump trucks, front-end loaders, skid steers, and other miscellaneous contractor storage equipment, such as conex boxes. It is anticipated that materials would be delivered to the Vineyard Haven Harbor and be trucked to the site via public right-of-way.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL EFFECTS

This section describes the environment potentially affected by the alternatives, evaluates potential environmental effects, and recommends measures to avoid or reduce those effects. Effects are changes to the existing environment including ecological, aesthetic, historic, cultural, economic, social, or health conditions. Effects may also include consequences resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial (40 C.F.R. 1508.1(g)(1)).

When possible, quantitative information is provided to establish the magnitude of potential effects; otherwise, the potential effects are evaluated qualitatively based on the criteria listed in Table 5-1.

Table 5-1: Classification of Potential Effects

Effect Scale	Criteria
None/Negligible	Resource area would not be affected and there would be no effect, OR changes or benefits would either be nondetectable or, if detected, would have effects that would be slight and local. Effects would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Adverse or beneficial effects would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional scale effects/benefits. Effects would be within or below regulatory standards, but historic conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes to the resource would be readily measurable and would have substantial consequences/benefits on a local or regional level. Effects would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce effects, though long-term changes to the resource would be expected.

Table 5-2 dentifies the resources that would not be affected by either the No Action alternative or the Proposed Action because they do not exist in or adjacent to the project area or the alternatives would have no effect on the resource. These resources were removed from further consideration in this SEA. In addition, a number of resources were adequately evaluated in the USACE EA and those evaluations are incorporated by reference. Additional evaluation of resources sufficiently analyzed in the USACE EA is not required.

Table 5-2: Resources Not Present or Fully Covered Under USACE EA

Resource	Reason for Elimination from SEA
Designated Farmland Soils (Farmland Policy Protection Act)	Soils in the project area are approximately 73 percent Carver loamy coarse sand and 27 percent land under the ocean. Neither of these soils are prime farmland soils, unique farmland soils, or farmlands of statewide or local importance. The Farmland Policy Protection Act would not apply.
Seismic Hazards (Executive Order 12699 Seismic Safety)	The project is not in a seismically active area nor would it affect seismic activity.
Air Quality (Clean Air Act)	The proposed action was analyzed for conformity applicability in the USACE EA pursuant to regulations implementing Section 176(c) of the Clean Air Act. It was determined that the proposed activities would not exceed *de minimis* levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 C.F.R. Part 93.153. The evaluation in the USACE EA adequately addressed potential effects of the project.
Climate Change	Release of greenhouse gases would be negligible and would not result in a significant effect on climate.
Wetlands (Executive Order 11990)	There would be no effect on wetlands. A portion of the project is mapped within Marine Subtidal Unconsolidated Bottom on the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (USFWS 2021a). This classification does not require the wetland 8-step process under Executive Order (EO) 11990, as it is not classified as wetlands per Section 7(c) of the EO. As part of their permit review, USACE reviewed the entire project area and did not find any wetlands outside of the area covered by the USACE EA; therefore, this resource has been adequately evaluated by USACE.
Federally Designated Wild and Scenic Rivers (Wild and Scenic Rivers Act)	The project is not near and would not affect a Wild or Scenic River. The closest river designated as wild and scenic is the Taunton River, which is off-island and approximately 35 miles northwest of the project site.
Coastal Barrier Resources System (Coastal Barrier Resources Act)	The project area is not within a Coastal Barrier Resource Unit, an Otherwise Protected Area, or associated Buffer Zone (USFWS 2021c).
Endangered and Threatened Species (Endangered Species Act)	The USFWS's Information for Planning and Consultation (IPaC) system identified the Roseate tern (*Sterna dougallii dougallii*) and the northern long-eared bat (*Myotis septentrionalis*) as the only listed species potentially present in the project area. The USACE EA determined that no suitable habitat for the Roseate tern was present in or adjacent to the project area and a no effect determination was made with concurrence from USFWS. The Proposed Action would not remove trees; hence, there would be no effect on the northern long-eared bat. Compliance with the Endangered Species Act was adequately addressed in the USACE EA. USACE consulted with NMFS regarding threatened and endangered species that has resulted in a Not Likely to Adversely Affect determination.

Resource	Reason for Elimination from SEA
Bald Eagles (Bald and Golden Eagle Protection Act)	Bald and Golden eagles are not present and the habitat in the project area is not suitable for perching, roosting, or foraging. Determination made after coordination with Emily Holt (MA Division of Fish and Wildlife) on January 21, 2021 a review of the MA Natural Heritage and Endangered Species Program's rare species viewer, Priority Habitat Mapper, and USFWS IPaC.
Transportation	The current closure of East Chop Drive has resulted in the rerouting of traffic to neighborhood streets. The project would not result in additional street closures and would utilize the current closure of East Chop Drive to facilitate project activities. The USACE EA concluded that the project would result in the protection and reconstruction of the existing roadway and infrastructure, including landward private property.
Hazardous Waste (Resource Conservation and Recovery Act)	Project activities would not affect or be affected by hazardous waste sites.

5.1 Physical Resources

5.1.1 Topography, Geology, and Soils

5.1.1.1 Existing Conditions

The project area is within the Cape Cod Coastal Lowlands and Island ecoregion, where the topography is characterized by generally flat elevations of less than 150 feet and has a relief typically less than 60 feet (EPA 2009, MDFW 2020). The project area's elevations range between -7 and 30 feet National Geodetic Vertical Datum of 1929. The bedrock geology in the area consists of granites, gneiss, and schist covered in 200 to 400 feet or more of gravel, sand, silt, and clay (MDFW 2020). The project area consists of 73 percent carver loamy coarse sand and 27 percent ocean water (See **Appendix A, Figure 3**) (EPA 2021d). According to an engineering study on the conditions of the Bluff (CLE 2017), the existing slope of the project area is 34 degrees, which limits soil stability and contributes to the project area's vulnerability to erosion. Steeper slopes are associated with higher levels of erosion because of the increased velocity of surface water runoff and its ability to collect more soil and sediment as it flows downhill (Duley and Hays 1932). For sandy and loamy soils, such as those in the project area, the angle of repose, or the angle beyond which a slope has a tendency to fail, is 34 degrees.

5.1.1.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, the topography, bedrock, and soils in the project areas would not be disturbed by construction activity. However, the existing revetment would not be stabilized or expanded, and the slope of the bluff would not be reduced. The bluff slope would maintain the high risk of erosion, which could lead to slope failure. Soil erosion would likely not reach bedrock depths, and thus, there would be no effect on bedrock geology. The bluff would remain at risk of erosion from continued wave action, storm surge, and stormwater runoff that could worsen from sea-level rise. The Town may use localized erosion control measures to reduce soil erosion at the project area under the No Action alternative, but measures would likely be temporary or would not provide cohesive protection to the entire project area. Therefore, there would be a moderate long-term adverse effect on soils and topography from continued wave action, storm surge, and stormwater runoff.

Proposed Action

Under the Proposed Action, ground disturbance would occur both landward and seaward of the HTL. Ground disturbance seaward of the HTL is discussed in the USACE EA. Construction of the Proposed Action would require a total ground disturbance of approximately 2.6 acres to depths ranging between approximately 10 and 20 feet, and would occur up to approximately 70 feet landward of the HTL. The topography of the project area would be regraded to reduce the slope from the existing 34 degrees to 27 degrees, enhancing slope stability. Construction site best management practices (BMPs) would be implemented to minimize construction-related erosion and sediment loss. BMPs would include the use of a silt curtain or turbidity boom at the toe of the revetment, and hay or straw bales surrounding stockpile areas to prevent runoff. Permit conditions and mitigation measures would be implemented, as specified in the approved USACE Section 10/404 permit (permit NAE-2017-01616) and the combined Section 401 Water Quality Certification and Chapter 91 Dredge permit from the Massachusetts Department of Environmental Protection (MADEP) processed on October 23, 2019. Ground disturbing activities would not reach bedrock depths and thus would have no effect on geology.

The expanded revetment would prevent soil loss by protecting soils from wave-related erosion. The regraded bluff would slow down stormwater runoff and allow the roots of native vegetation to hold soils in place, reducing soil loss and changes in the topography from erosion. Therefore, there would be a minor short-term adverse effect on topography and soils during construction and a moderate long-term beneficial effect on topography and soils from the reduced risk of erosion from both coastal waves and stormwater runoff.

5.2 Water Resources

5.2.1 Water Quality

The Clean Water Act (CWA) regulates the discharge of pollutants into water and is implemented by USACE and EPA. Section 404 of the CWA establishes the USACE permit requirements for discharging dredged or fill materials into waters of the United States. USACE also administers Section 10 of the Rivers and Harbors Act of 1899, which prohibits obstructions in navigable waterways. MADEP administers Section 401 of the CWA and issues water quality certifications for the discharge of dredged materials, dredging, and dredged material disposal in waters of the United States. Under Section 402 of the CWA, the National Pollution Discharge Elimination System (NPDES) regulates both point and nonpoint pollutant sources including stormwater and stormwater runoff. Activities that involve one or more acres of ground disturbance require an NPDES permit. Section 402 is administered by EPA in Massachusetts.

5.2.1.1 Existing Conditions

The project area is adjacent to the coastal waters of Nantucket Sound, with the Atlantic Ocean to the east and Oak Bluffs Harbor to the south. Stormwater from the adjacent neighborhood drains through the project area and into the Nantucket Sound (Martha's Vineyard Commission 2015a). There are no surface freshwater sources within or adjacent to the project area.

USACE analyzed potential effects of the Proposed Action within waters of the United States up to the HTL in the USACE EA, and that analysis is included in this SEA by reference. USACE determined there would be a permanent effect and associated loss of waters of the United States from the placement of riprap and

fill. Mitigation measures were developed and specified in the USACE permit (number NAE-2017-01616). The water quality effects related to the discharge of dredged material are authorized by the MA DEP combined Section 401 Water Quality certification and Chapter 91 Dredge permit (permit 15069 issued on October 23, 2019) as well as the Order of Conditions specified by MA DEP under the Wetlands Protection Act in the interest of storm damage prevention, prevention of pollution, and protection of wildlife (SE53-0076).

5.2.1.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, storm surge and wave action would continue to degrade the existing revetment and erode the bluff, causing soil and sediment to flow into Nantucket Sound and negatively affect water quality. The bluff would not be replanted and vegetation would continue to be lost to erosion, further reducing stormwater filtration that could cause nonpoint source pollution to enter coastal waters. Waves would continue to overtop the revetment during storms and receding waters and waves could carry debris, sediment, and non-point source pollutants into the Sound. The existing catchment basins are failing and they would not be repaired or replaced, reducing their ability to filter sediment and contaminants from stormwater. Thus, the No Action alternative would have a minor long-term adverse effect on water quality from continued deterioration of the existing revetment, continued erosion of the bluff, and reduced stormwater filtration.

Proposed Action

Under the Proposed Action, during construction, equipment used and staged landward of the HTL could potentially have hazardous leaks and spills that could contaminate stormwater that flows into the Sound. Ground disturbing activities would create the potential for soils to erode into coastal waters. The Town would need to adhere to the BMPs and conditions specified in the CWA Section 401 and 404 permit approvals, such as using equipment in good condition and placing hay bales or wattles as erosion control measures, during all phases of construction to prevent the accidental release of hazardous waste and erosion of soils. Conditions specified for the Chapter 91 Dredge permit include adhering to anti-degradation provisions of the Massachusetts Surface Water Quality Standards, working at low tide cycles to minimize water turbidity, and collection of any oily material or residue released during project activities that would reduce potential effects to water quality. The Order of Conditions specified by MA DEP includes the use of clean fill material and erosion/sedimentation control measures.

The Town would also need to coordinate with EPA on the need for Section 402 NPDES permits. A construction general stormwater NPDES permit would be required because the amount of ground disturbance exceeds 1 acre. An NPDES discharge permit may be required for the work on the two drainage outfalls and catchment basins . As long as the Town complies with all BMPs and permit conditions of the issued and potential future permits and authorizations, construction would have a minor short-term adverse effect on water quality, including the in-water work covered by the USACE EA.

The Proposed Action would protect East Chop Bluff from wave action (which could increase with sea-level rise) that causes erosion and the associated discharge of sediment and other contaminants into coastal waters. Between the revetment and the East Chop Bluff guardrail, the bluff would be regraded to a more stable slope to allow for the planting of native salt-tolerant vegetation, which would provide added

stormwater filtration and sediment stability. Existing catchment basins along East Chop Drive would be replaced and treatment filters woud be added to improve stormwater managementand filtration that would reduce pollutants carried by stormwater entering Nantucket Sound. Therefore, the Proposed Action landward of the HTL would have a minor long-term benefit on water quality from reduced erosion and increased stormwater filtration and drainage.

5.2.2 Floodplains

Executive Order (EO) 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, the long- and short-term adverse effects associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Each federal agency shall provide leadership and shall take action to reduce the risk of flood loss; minimize the effect of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains in carrying out agency responsibilities. FEMA uses an 8-step decision-making process to evaluate potential effects on, and mitigate effects to, floodplains in compliance with EO 11988 and 44 C.F.R. Part 9.

Initial public notice for the project was published April 30, 2021 on the Town website and on May 7, 2021 in the *Vineyard Gazette*. FEMA will issue a final notice as part of the SEA public notification process in accordance with 44 C.F.R. 9.8 and 9.12. The purpose of the notices is to inform and solicit feedback from the public regarding potential effects on floodplains and notify the public of FEMA's final decision.

The Massachusetts Department of Conservation and Recreation (DCR) Flood Hazard Management Program is the coordinating office for the National Flood Insurance Program (DCR 2009). The Town participates in the National Flood Insurance Program and regulates floodplain development through its Floodplain Ordinance (Section 8.1 of local bylaws).

5.2.2.1 Existing Conditions

The project area is partially within a special flood hazard area (Zone VE) subject to inundation by the 1 percent annual coastal flood that has additional hazards associated with storm waves, as shown on the FEMA Flood Insurance Rate Map panel 25007C0108J dated July 20, 2016 (see **Appendix A: Figure 4**). The area is frequently flooded from storm surge and wave action that often overtops the revetment, causing damage and erosion to the area.

5.2.2.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, there would be no construction within or adjacent to the project site that could affect the floodplain. The existing revetment would not be stabilized or expanded and would continue to deteriorate from storm surge and wave action that could worsen with future sea-level rise. Flooding and wave action could continue to erode the bluff and undercut East Chop Drive further, causing the road to remain closed and potentially causing hazardous conditions for nearby residents. Deteriorated catchment basins would not be replaced and would not adequately filter potential stormwater contaminants before they are discharged into the floodplain. Therefore, the No Action alternative would have a minor long-term adverse effect on the floodplain because of continued erosion and sedimentation. The 8-step analysis

determined that the No Action alternative is not a practicable alternative because it would not meet the purpose and need for the project (See **Appendix B, Document 2**).

Proposed Action

Under the Proposed Action, construction activities would occur in the floodplain and would result in the placement of 6,005 cubic yards of riprap over 15,180 square feet below the HTL, as analyzed in the USACE EA. Approximately 2,500 square feet of additional fill would be placed landward of the HTL within the floodplain. Construction activities could result in an accidental release of fuels or lubricants and have the potential to promote the spread of invasive plant species within the floodplain (see **Section 5.4.3**). In the 8-step analysis, alternatives to locating the project in the floodplain were determined to not meet the purpose and need of the project (see **Appendix B, Document 2)**. There would be minor short-term adverse effects on the floodplain from construction activities both below the HTL, as described in the USACE EA, and above the HTL, as described in this SEA. The adverse effects would be mitigated through BMPs and through an in-lieu fee (ILF) payment to the Massachusetts Division of Fish and Wildlife ILF program would provide compensatory mitigation for permanent effects, as stipulated in the USACE EA and permits (See **Section 5.2.1**). BMPs include using equipment in good condition and placing hay bales or wattles as erosion control measures.The purpose and need of the project is functionally dependent upon being located within the floodplain, and the Proposed Action would preserve many of the natural floodplain functions and protect adjacent infrastructure and property; potential effects would be minimized as long as all permit and grant conditions are adhered to, in accordance with 44 C.F.R. 9.11. The expansion of the revetment would protect the bluff and adjacent infrastructure, and nearby residences from damage by mitigating erosion. Therefore, there would be a minor long-term beneficial effect on infrastructure and property from reduced flood-related damage and a minor long-term benefit on the health of the floodplain because of the reduction in sedimentation.

5.2.3 Safe Drinking Water Act

Section 1424(e) of the Safe Drinking Water Act of 1974 authorizes EPA to designate an aquifer for special protection under the sole-source aquifer program. EPA can make this designation if the aquifer is the sole or principal drinking water resource for an area and if its contamination would create a significant hazard to public health.

5.2.3.1 Existing Conditions

The Martha's Vineyard aquifer is designated as the sole source aquifer for Martha's Vineyard Island and it is the sole source of drinking water for all residents and visitors of the island (EPA 1988). According to EPA, the aquifer is vulnerable to contamination because of the island's geological characteristics and land use patterns (EPA 1988). The dominant medium of the aquifer is silica sands that are highly permeable and allow contaminants to easily infiltrate the water supply once they are introduced into the soils above the aquifer (EPA 1988). There are various sources of potential water pollutants that include chemical spills, roadway runoff, leaking storage tanks, road salting operations, saltwater intrusion, and landfill leachate (EPA 1988). However, there are no known hazardous materials or producers present in or near (within 0.5 miles) the project area (See **Table 5.2**) (EPA 2021d).

5.2.3.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, construction would not occur in the project area and there would be no risk of potential for construction-related leaks and spills that could contaminate the aquifer. Wave action compounded by future sea-level rise could continue to erode the bluff. Stormwater may contain contaminants that could infiltrate the aquifer without proper management, and under the No Action alternative, the existing failing catchment basins would not be replaced to provide proper filtration and discharge to Nantucket Sound. Therefore, there would be a negligible long-term adverse effect on the Martha's Vineyard sole source aquifer from contaminated stormwater being released on the shore.

Proposed Action

Under the Proposed Action, the use of construction equipment could result in leaks and spills that could infiltrate the ground and contaminate the aquifer. Construction BMPs, such as keeping equipment maintained and following construction-related BMPs required by the CWA permits (see **Section 5.2.1**), would reduce the risk of contaminants entering the aquifer. BMPs included in the Chapter 91 Dredge permit include adhering to anti-degradation provisions of the Massachusetts Surface Water Quality Standards, working at low tide cycles to minimize water turbidity, and collection of any oily material or residue released during project activities thus reducing the potential effects to the sole source aquifer. With the BMPs, there would be a negligible effect to the sole source aquifer from construction-related contamination. Replaced catchment basins and vegetation plantings would improve stormwater filtration in the project area over the long term, reducing the amount of contaminants that could enter the aquifer. Therefore, there would be a negligible beneficial long-term effect from improved stormwater filtration.

5.3 Coastal Resources

5.3.1 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA), 16 U.S.C. § 1451 et seq., enacted in 1972, was established to preserve, protect, develop, and, where possible, restore or enhance the resources of the nation's coastal zone. Section 307 of the CZMA requires federal actions, within (or outside of but with the potential to affect) the coastal zone, to be consistent with the enforceable policies of a state's federally approved coastal management program. The Massachusetts Office of Coastal Zone Management (MA CZM) is responsible for managing the state's coastal program, which includes four main objectives, per the Massachusetts Coastal Management Policy Guide: (1) prevent, eliminate, or significantly reduce threats to public safety, property, and environmental resources resulting from hazards such as erosion, flooding, and storm damage; (2) allow natural physical coastal processes to continue while allowing appropriately sited coastal development and economic growth and promote the use of nonstructural alternatives for shore protection, where appropriate and to the extent feasible; (3) limit, prohibit, or condition public expenditures in coastal high hazard areas to ensure that increased exposure to coastal hazards is not encouraged; and (4) prioritize public expenditures for acquisition and relocation of structures out of hazardous coastal areas (MA CZM 2011).

5.3.1.1 Existing Conditions

The project area is on the shoreline of Martha's Vineyard and the entire island is within the regulated Cape Cod and Islands coastal zone region for Massachusetts, as shown in **Appendix A: Figure 5** (MA CZM 2021). The existing revetment is currently in disrepair which reduces the bluff and revetment's ability to prevent, eliminate, or significantly reduce threats to public safety, property, and environmental resources resulting from erosion and storm damage (policy objective 1).

5.3.1.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, wave action and storm surge, compounded by sea-level rise, would continue to further degrade the revetment, erode the bluff, and potentially reduce vegetation in the project area. The reduced vegetation would further destabilize the bluff and potentially damage infrastructure adjacent to the project area causing a threat to public safety and property. Therefore, the No Action alternative would have a minor long-term adverse effect on coastal resources and would be inconsistent with MA CZM coastal policies.

Proposed Action

Under the Proposed Action, construction activities would occur both landward and seaward of the HTL within the designated coastal zone. As part of the USACE EA, coordination with MA CZM occurred for the portion of the project located seaward of the HTL. On January 9, 2020, MA CZM determined that the proposed project seaward of the HTL is consistent with its program policies. The mitigation measures required for the work below the HTL in the USACE and MADEP permits would reduce the risks of erosion and sedimentation related to construction and would be consistent with MA CZM coastal policies. The Proposed Action landward of the HTL has not yet been determined to be consistent with MA CZM program policies. The Town would need to coordinate with the MA CZM for a consistency determination for this portion of the project.

The Proposed Action landward of the HTL should be consistent with objectives one, two, and three of the Massachusetts Coastal Management Policy Guide. Objective four would not apply as structures would not be acquired and removed from the coastal hazard area. The upgraded revetment and stabilized bluff would mitigate hazards from erosion, flooding, and storm damage in and near East Chop Drive, which should be in alignment with objectives one and three of the Massachusetts Coastal Management Policy Guide. The bluff slope would be regraded to reduce its slope and then would be planted with native vegetation, which provides nonstructural protection for the shoreline, which should be in alignment with objective two. Therefore, it is anticipated that the Proposed Action would be consistent with MA CZM program policies and because there would be a minor long-term beneficial effect on coastal resources the project should be consistent with MA CZM coastal polices. Consulation with MA CZM is required to confirm this finding.

5.4 Biological Resources

5.4.1 Vegetation

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) manages state-designated rare plants and natural communities under the Native Plant Protection Act of 1987 (RSA 217-A). NHESP is responsible for the conservation and protection of hundreds of species that are not hunted, fished, trapped, or commercially harvested in the state, as well as the protection of the natural communities that make up their habitats.

5.4.1.1 Existing Conditions

The project area is in the Cape Code Coastal Lowlands and Island ecoregion, which is distinguished by a moderate maritime climate and stunted pine and oak forests (MDFW 2020) (see **Appendix A, Figure 6**). Historically, the project area most likely would have supported a maritime shrubland community, which occurs along the coast within the area of direct influence of the ocean and salt spray, such as along coastal bluffs. Maritime shrubland communities are dominated by patches of dense shrubs with scattered areas of more open low growth or bare ground, and have less than about 25 percent tree canopy (MDFW 2020). The project area has been highly modified by residential development, bluff erosion, and stabilization measures, and currently supports beach grass (*Ammophila breviligulata*), beach rose (*Rosa rugosa*), poison ivy (*Toxicodendron radicans*), and small trees. Erosion has increased the slope of the bluff reducing native plants' ability to establish roots.

NHESP did not identify state-designated rare plants or natural communities in the project area (NHESP 2021). As part of this SEA, FEMA corresponded with NHESP and determined that the proposed project area is not delineated as Estimated Habitat or Priority Habitat according to the 14th Edition Natural Heritage Atlas. Therefore, no further review is needed pursuant to the Massachusetts Endangered Species Act regulations (321 Code of Massachusetts Regulations [CMR] 10.18) and the rare species provisions of the Wetlands Protection Act (310 CMR 10.37, 10.58(4)(b), 10.59).

5.4.1.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, although existing vegetation would not be disturbed by construction activities, storm surge and wave action would continue to inundate existing vegetation and erode the bluff. The bluff would not be stabilized and would remain at a slope such that native plants have difficulty establishing and retaining root systems. The bluff would not be replanted with native vegetation. The existing disturbed eroding soils of the bluff may also support the spread of invasive nonnative species. Therefore, there would be a minor long-term adverse effect on vegetation health and diversity under the No Action alternative.

Proposed Action

Under the Proposed Action, construction activities would remove the vegetation within the project area to regrade the slope and build the revetment. The reduced bluff slope would support establishment of native plant species. Between the revetment and the East Chop Drive guardrail, the bluff slope would be planted with native salt-tolerant vegetation, such as beach rose, which would reduce the risk of invasive and noxious species spread. As specified in the Order of Conditions signed by DEP on July 5, 2019 to meet the

requirements of the Massachusetts Wetlands Protection Act, replanting would need to adequately stabilize the bluff and sustain an 80 percent survival rate after two growing seasons (SE53- 0076). Therefore, the Proposed Action would have a minor short-term adverse effect on vegetation during construction and a minor long-term beneficial effect with the establishment and plantings of native plants.

5.4.2 Wildlife and Fish

NHESP is responsible for the conservation and protection of hundreds of species that are not hunted, fished, trapped, or commercially harvested in the state, as well as the protection of the natural communities that make up their habitats. MA CZM manages the state's coastal habitats through the Coastal Habitat Program. In partnership with DCR, the MA CZM Critical Habitat Program identifies and designates Areas of Critical Environmental Concern, defined as places recognized because of the quality, uniqueness, and significance of their natural and cultural resources.

The Migratory Bird Treaty Act provides a program for the conservation of migratory birds that fly through lands of the United States. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. The lead federal agency for implementing the Migratory Bird Treaty Act is USFWS. The law makes it unlawful at any time, by any means, or in any manner to take any part, nest, or egg of migratory birds. "Take" is defined in regulation (50 C.F.R. 10.12) as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities."

5.4.2.1 Existing Conditions

Mammal species associated with the maritime shrublands community include white-tailed deer (*Odocoileus virginianus*), white-footed mice (*Peromyscus leucopus*), and meadow voles (*Microtus pennsylvanicus*). Because the project area habitats are degraded by loss of vegetation because of erosion, the diversity of species that can use the project area are reduced.

The nearshore environment along the existing revetment is relatively shallow, and consists of mixed sand, gravel, and cobble with interspersed boulders but no submerged aquatic vegetation. The area supports a low abundance and diversity of shellfish and benthic organisms. Wave action against the existing revetment may contribute to the low numbers of organisms observed within the project area (Stantec 2019).

The project area is within the Atlantic Flyway and there is the potential for migratory bird species to occur in the project area because of the presence of various beach grasses and small trees (USFWS 2021b, 2021d). Maritime shrublands are heavily used by migratory birds during fall migration for cover and forage because many of the typical plants have fruit attractive to migrants (MDFW 2020). The USFWS IPaC indicates the Red-throated loon (*Gavia stellata*), a bird of conservation concern, has the potential to occur in or near the project area.

As part of this SEA, FEMA corresponded with NHESP, which determined that the proposed project is not delineated as Estimated Habitat or Priority Habitat according to the 14th Edition Natural Heritage Atlas (FEMA 2021a). Therefore, no further review is needed pursuant to the Massachusetts Endangered Species Act regulations (321 CMR 10.18) and the rare species provisions of the Wetlands Protection Act (310 CMR 10.37, 10.58(4)(b), 10.59). According to DCR, no Areas of Critical Environmental Concern are present within or in proximity to the project area (DCR 2021a). The project area is within a Habitat Area of Particular Concern for inshore juvenile cod, as described in **Section 5.4.4.1**.

5.4.2.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, existing coastal habitats would not be altered by construction activities. The bluff would continue to erode, which would continue to reduce vegetation and habitat for migratory birds and other wildlife on the bluff. Continued deterioration of the revetment could wash sediment away from the project area during storm surges potentially removing habitat from the intertidal and nearshore areas. Fish and other marine species that presently use the revetment as habitat would experience a loss of habitat over time and sedimentation in the marine environment may adversely affect habitat further away. Pollutants in stormwater runoff that are not addressed by the failing catchment basins could adversely affect both terrestrial and marine habitats. Therefore, there would be a minor long-term adverse effect on wildlife and fish from the loss of and potential contamination to wildlife habitat.

Proposed Action

Under the Proposed Action, construction would result in the temporary loss of vegetation that could serve as habitat for wildlife. Construction activities would increase noise levels that could result in the temporary displacement of wildlife and fish during construction as they move away from noise sources. The Town would be required to adhere to the BMPs and conditions specified in the permit approvals and local noise ordinances Chapter 14 of the Town bylaws (Oak Bluffs 2018) during all phases of construction to reduce temporary and permanent effects on wildlife and fish habitat. Wildlife would likely return to the area once construction activities are complete. Therefore, there would be a minor short-term adverse effect on wildlife species in the area from construction-related activities landward of the HTL.

Construction activities could result in a minor short-term adverse effect on migratory bird species protected by the MBTA if construction activity occurs during the breeding season. Vegetation removal associated with regrading the bluff slope could result in the loss of nests, eggs, and young. However, because the habitat in the potential disturbance area is degraded, the potential for MBTA species to occur in and adjancent to the project site is low and construction activity would be far enough away from inland habitats to have minimal adverse effect due to noise. .

The Proposed Action would include native plantings, which would increase the health and diversity of habitat for wildlife and migratory birds. The improved revetement would result in protection for and stability of the habitats created along the bluff for wildlife and migratory birds. Therefore, there would be a minor long-term beneficial effect on wildlife and migratory birds from the bluff restoration and improved protection of the bluff landward of the HTL.

The repair and replacement of the catchment basins and the reduction of erosion would reduce sedimentation and stormwater pollutant inputs into the water and provide negligible benefits to marine species. The expansion of the revetment would result in the loss of approximately 3,821 square feet of marine habitat that would be mitigated for through an in-lieu fee payment as required by the USACE permit. With the implementation of this compensatory mitigation measure, the potential effect on fish and marine species would not be significant.

5.4.3 Invasive Species

EO 13112, Invasive Species, requires federal agencies to, to the extent practicable, prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health effects that invasive species cause. Invasive species often prefer disturbed habitats and generally possess high dispersal abilities, enabling them to outcompete native species. The Massachusetts Department of Agricultural Resources (MDAR) is the lead state agency responsible for the management of invasive plant species in accordance with state law. Invasive plant species are regulated by the state through the Massachusetts Prohibited Plant List, which prohibits the importation, sale, and trade of plants determined to be invasive in Massachusetts (MDAR 2021).

In addition to invasive plant species, United States Department of Agriculture (USDA) establishes quarantines for invasive animal species that include the European gypsy moth (EGM) (USDA 2021a, 2021b). The quarantine for the emerald ash borer (EAB) was rescinded in January 2021.

5.4.3.1 Existing Conditions

The Massachusetts Prohibited Plant List contains 143 invasive species and was developed by MDAR in conjunction with the Massachusetts Invasive Plant Advisory Group (MIPAG). MIPAG evaluates and categorizes invasive plants in three categories (MIPAG 2017):

- Invasive – Non-native species that have spread into native or minimally managed plant systems in Massachusetts
- Likely Invasive – Non-native species that are naturalized in Massachusetts
- Potentially Invasive – Non-native species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within Massachusetts

MIPAG has identified 69 species that meet all three categories in Massachusetts, of which 35 have been identified as Invasive and all of which could be located in and around the project area.

Martha's Vineyard is in a USDA quarantine zone for EGM (USDA 2021b) and EAB are present within the state, although EAB are no longer under USDA quarantine. The EAB inhabit ash trees, which are not present in the immediate project area but may be present in the project vicinity. EGM larvae feed on over 500 plant species, some of which may be present near the project area. EAB have not been detected on Martha's Vineyard Island but EGM have been detected in the Town of Oak Bluffs as recently as 2016 (DCR 2021b, Rich Saltzberg 2016). The trees within the project area are small junipers and pines that are unlikely to support the presence of EAB, as they prefer ash trees, or EGM, as they prefer deciduous trees.

5.4.3.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, vegetation would not be disturbed by construction activities within the project area, therefore, the accidental spread of invasive plant species by construction activities would not occur. The existing, failing revetment would not be repaired and waves and storm surge would continue to overtop the revetment, which could potentially spread invasive plant species from the project area to other areas along the shoreline. Soils exposed by erosion would be more likely to recolonize with invasive plant species than with native species, resulting in the spread of invasive species throughout the project area. The

degraded condition of the bluff would be unlikely to contribute to the spread of EAB and EGM, as there are no tree species in the project area that could support them and the degraded conditions are not conducive to the establishment of trees. Therefore, there would be no short-term effects related to the spread of invasive species from construction activities and there would be a long-term minor adverse effect on the spread of invasive species from continued degradation of the revetment and bluff.

Proposed Action

Under the Proposed Action, ground disturbance and vegetation removal from construction-related activities could cause the spread of invasive plant species, but the magnitude of this potential effect would be reduced with implementation of construction BMPs, as described in USACE EA and the Section 401 water quality certification, to reduce erosion and sedimentation and thus reduce the potential spread of invasive seed. Fill materials could potentially contain invasive plant seeds, but this potential effect would be avoided by sourcing fill from a licensed location (see **Section 5.5**). EAB and EGM are unlikely to occur within the project area and EAB is no longer subject to quarantine guidelines; however, woody debris disposal would still be required to follow USDA quarantine guidelines for EGM (USDA 2021a, 2021b). The repair and expansion of the revetment could reduce waves and storm surge from entering planted areas that could contain invasive species and carrying seeds and plant parts to new shoreline areas. Replanting the bluff with native species would reduce the ability of invasive species to reestablish themselves within the project area. Therefore, the Proposed Action would have a negligible short-term adverse effect on the spread of invasive species and a minor long-term beneficial effect because of the reduced risk of invasive species spread and establishment.

5.4.4 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act is the primary law governing marine fisheries management in U.S. federal waters and designates the National Marine Fisheries Service as the lead federal agency responsible for its implementation. First passed in 1976, the Magnuson-Stevens Act fosters long-term biological and economic sustainability of our nation's marine fisheries. One primary provision of the Act is the designation of Essential Fish Habitat for all species managed under the Act. All federal agencies are required to assess the potential effects that proposed actions and alternatives may have on Essential Fish Habitat and requires that federal agencies consult on any actions that would adversely affect Essential Fish Habitat.

5.4.4.1 Existing Conditions

Portions of the project area are within EFH, including intertidal and subtidal zones. The intertidal and nearshore subtidal areas of Nantucket Sound and East Chop Bluff contain sand and cobble/gravel habitats that serve as habitat for many marine fish and shellfish species. The project area is also within a NMFS Habitat Area of Particular Concern for inshore juvenile cod. USACE consulted with NMFS to confirm anticipated effects on and mitigation measures for EFH. According to the NMFS EFH Mapper and the NMFS consultation response letter dated September 5, 2019, the project area contains 9 EFH-designated species for eggs, 9 species for larvae, and 23 species for juvenile fish (NMFS 2020).

5.4.4.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, construction activities would not occur in the project area or in EFH, and would not cause construction-related pollutants and sedimentation to runoff into EFH. Continued bluff erosion may result in the transport of sediment and pollutants into EFH, and waves and storm surge could cause nonpoint source pollution in the area to enter EFH. The aging catchment basins would continue to be a source of nonpoint source pollution with loads that could increase because of continued deterioration. Therefore, there would be no short-term effect from construction activities and a minor long-term adverse effect on EFH from continued sedimentation and contamination from bluff erosion and stormwater runoff.

Proposed Action

Under the Proposed Action, the existing revetment footprint would be expanded both landward and seaward and would require the conversion of intertidal substrate into engineered stone, resulting in the permanent loss of EFH. Construction activities landward of the HTL would result in ground disturbance that could cause soils and sediment to enter nearby EFH as well. As part of the USACE EA, consultation occurred with NMFS regarding effects on EFH from the Proposed Action, and the cumulative Phase 2 action described in **Section 5.7**. In a response dated September 5, 2019, NMFS determined there would be a permanent adverse effect on EFH and recommended compensatory mitigation and construction erosion control measures (USACE 2019a). The USACE response, dated September 24, 2019, recommended the following erosion control measures be implemented during construction (USACE 2019b):

- Install staked hay bales along the top of the revetment to prevent debris and sediments from blowing/eroding into Nantucket Sound
- Install a floating boom along the lengths of work sections (typically 10 to 200 feet in length) to trap any potential floating debris
- During construction, maintain all sedimentation/erosion control barriers in stable condition at all times
- Keep the work site clean of debris and accumulated soils to prevent wind deposition of fugitive dust and debris at the close of each day
- Prior to the start of construction, the Town shall provide USACE with a written description of erosion/sedimentation control methods to be used during the project

FEMA consulted with NMFS to confirm these erosion control measures and in a letter to FEMA dated April 19, 2021, NMFS accepted the measures to minimize potential effects during construction (FEMA 2021b). USACE permit NAE-2017-01616 also stipulates compensatory mitigation in the form of a payment to the Massachusetts ILF program (administered by the MDFW Environmental Mitigation Trust) in the amount of $38,442.11 to compensate for the permanent loss of habitat.

Post-construction, the stabilized revetment and the regraded bluff would reduce wave and storm surge erosion, potentially reducing the amount of sediment and pollutants entering EFH. The improved storm drains, catchment basins, and the regraded and revegetated bluff could reduce the level of nonpoint source pollution reaching EFH in stormwater runoff.

Therefore, the Proposed Action would result in a minor short-term adverse effect on EFH from in-water work that would be mitigated with the implementation of erosion control measures. The loss of EFH habitat would cause a minor long-term adverse effect that would be compensated for in the form of ILF seaward of the HTL. There would be a negligible long-term beneficial effect from the reduced erosion and sedimentation resulting from the stabilized bluff and improved quality of stormwater runoff.

5.5 Cultural Resources

Federal agencies must consider the potential effects of their actions upon cultural resources prior to taking action. Cultural resources are defined under NEPA as prehistoric and historic sites, structures, districts, buildings, objects, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Section 106 of the National Historic Preservation Act (NHPA) codifies this obligation and is implemented by regulation in 36 CFR Part 800. The NHPA defines a historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register." Eligibility criteria for listing a property on the National Register of Historic Places (NRHP) are found at 36 C.F.R. Part 60. While the definition of a cultural resource under NEPA can be broader, FEMA regularly uses Section 106 to meet its obligations to consider effects to cultural resources. For this project, FEMA determined that it was appropriate to utilize its NHPA review to fulfill its NEPA obligations.

Cultural resources determined to be potentially significant under the NHPA are subject to a higher level of review and federal agencies must consider the potential effects of their projects on those resources and consider steps to avoid, minimize, or mitigate those effects. Significant cultural resources, must meet one or more of the criteria established by the National Park Service in order for that resource to be eligible for inclusion in the NRHP. The term "eligible for inclusion in the NRHP" includes all properties that meet the NRHP listing criteria, outlined in the Department of Interior regulations Title 36, Part 60.4 and NRHP Bulletin 15. Properties and sites not evaluated at the time of the undertaking may be considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

5.5.1 Identification of APE, Cultural Resources, and Consultation Process

36 CFR 800.4(a)(1) defines the Area of Potential Effects (APE) as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. Within the APE, effects to cultural resources are evaluated prior to the undertaking for both Standing Structures (above ground resources) and Archaeology (below ground resources). The APE for this undertaking consists of all areas of ground disturbance, including staging and access areas not on hardened surfaces, and any locations from which permanent alterations would be visible. This includes the full length of the footprint of ground disturbance for the repair and rehabilitation of the infrastructure and the eroded revetment along East Chop Drive. It also includes the public roadway and adjacent residences along East Chop Drive between Brewster and Harrison Avenues that are protected by the revetment.

The Massachusetts Historical Commission (MHC) maintains a database of the Commonwealth of Massachusetts' historic properties: the Massachusetts Cultural Resource Information System (MACRIS), which is regularly updated. FEMA uses this database as part of its efforts to identify significant cultural resources that may be affected by a project. A FEMA Secretary-of-the-Interior-qualified Historic Preservation Specialist conducted a search of MACRIS, the National Register of Historic Places National

Resources Information Service (NRHP NRIS) database, reviewed historical aerial images and historic maps, written histories of the project area and the Natural Resources Conservation Service's (NRCS) Web Soil Survey to assess the potential for eligible resources within the project APE.

History of the Project Area

The earliest-known inhabitants of the island now known as Martha's Vineyard include the Wampanoag people, although other tribes may have a direct association by proximity, diplomacy, or kinship. Though the exact date of their arrival is uncertain, there is evidence of camps and habitation sites dating to at least 2270 BCE. The Wampanoag call the island *Noepe*, which translates to "land amid the waters" or "land amid the streams." After contact with European colonizers, their population experienced a steady decrease in numbers due to European disease, conflict, political unrest, forced religious indoctrination, forced displacement westwards, and dispossession. However, the Wampanoag were able to maintain a presence in the area and at least six of the over 67 distinct tribal communities that make up the larger Wampanoag Nation remain today and still occupy their homeland.

The present-day Town of Oak Bluffs (*Ogkeshkuppe* in Wampanoag) was colonized by Europeans in circa 1642 and was part of Edgartown until the 1880s when it was incorporated as Cottage City. During the 1600s, many of the farms of these European settlers were operated by enslaved West Africans. In 1778, during the American Revolution, the British raided the island as a resource for cattle and sheep that resulted in a toll for the economy of Martha's Vineyard. The decline in the economy resulted in a 40-year negative effect on the whaling industry which did not restrengthen until circa 1820. However, it was also during this time that previously enslaved people, laborers, and sailors moved to the area and were able to purchase land from European settlers.

Around 1835, the Martha's Vineyard Camp Meeting Association held their first gathering for the purpose of Christian Methodist worship. Over time, more people joined in these gatherings and the Methodists built cottages around the camp area. Land developers saw money to be made from the religious pilgrims who also arrived to enjoy the charm of the Island's green interior and oceanfront landscapes.

In 1912, Charles Shearer established the very first inn for Black vacationers within one of the cottages in Oak Bluffs. By the early twentieth century, the area became a popular work and vacation destination for middle- and upper-class Black families who were attracted by the religious services and relative welcomeness when other towns on Martha's Vineyard did not welcome Black tourists until the 1960s. Senator Edward W. Brooke III, the first African American to win a United States Senate seat and the first to become a state Attorney General, vacationed in Oak Bluffs for many years. The nearby Inkwell Beach is a well-known source of inspiration for creatives during The Harlem Renaissance. The Vineyard's reputation as a vacation spot grew because of these activities and led to more people renting homes in the summers and purchasing property permanently. The Town's name was changed in 1907 from Cottage City to Oak Bluffs in response to growth in its year-round population and the changing face of the resort required an acknowledgement that the Town was no longer just a "Cottage City."

Although racial discrimination and restrictive covenants persisted on the island, some previously enslaved people and their descendants were able to become property owners, year-round residents, and small business entrepreneurs, especially in Oak Bluffs. In the 1920s, Black islanders began offering accommodations in their small cottages that attracted Black visitors from Boston, New York, Philadelphia, and other Northeastern cities. Many of these vacationers in turn became part-time or permanent residents.

Frequently called "The Black Hamptons," Oak Bluffs holds such significance for the Black community that the National Museum of African American History included it in their permanent exhibit, "Power of Place." The leisure community that first evolved in Oak Bluffs has now spread across all of Martha's Vineyard.

Standing Structures

Based on a review of the NRHP NRIS, there are no NRHP-listed properties, districts, or sites within the APE. However, according to MACRIS there are multiple Commonwealth-inventoried properties within or near the vicinity of the APE for the undertaking.

These buildings are listed in MACRIS as part of the Inventory of Historic Assets of the Commonwealth. Although listed in MACRIS, none of these buildings are currently included in any nomination for individual listing or as a contributing property to a Historic District for the NRHP. Therefore, FEMA evaluated these properties and the stone revetment, the subject structure, for eligibility for listing for the NRHP.

Archaeological Resources

According to MACRIS, there are no previously recorded archaeological sites within the APE. There are, however, several sites located within one mile of the project area. Based on a thorough review of site conditions, soil conditions, and documented cultural resources, FEMA determined that there is limited potential for the presence of intact archaeological resources within the project APE. The closest previously recorded archaeological sites are outside of the APE and are not expected to be affected based on their distance from the APE. Ground disturbance for this undertaking is limited to the project area and immediately adjacent areas used to access the project area. As such, FEMA found that it is unlikely any unidentified archaeological resources would be affected by this undertaking and no further identification efforts were needed for this undertaking.

Consultation

FEMA consulted with the Massachusetts State Historic Preservation Officer (SHPO) and Native American Tribal governments through the responsible Tribal Historic Preservation Officer (THPO) under Section 106 of the NHPA. FEMA presented its initial finding that that the Proposed Action would have "No Adverse Effect" on historic properties to the SHPO and the THPOs on June 14, 2021 (FEMA 2021c, FEMA 2021e, FEMA 2021f, FEMA 2021g). Concurrence with FEMA's finding was received by the SHPO and consultation concluded on June 21, 2021 (FEMA 2021d). No responses have been received from any of the Native American Tribal governments to date. Any responses received will be incorporated into the final version of this EA.

5.5.2 Standing Structures

5.5.2.1 Existing Conditions

Multiple properties lie within the APE between Brewster and Harrison Avenues: these houses are in the viewshed of the project and face East Chop Drive.

The buildings in the Town of Oak Bluffs are significant as part of the Vineyard Highlands, an area laid out originally in 1869 as an alternative to the Wesleyan Grove Campground by a group of Camp meeting Association Directors fearful of encroachments by the Oak Bluffs Land and Wharf Company on the Wesleyan Grove. The area includes the highest elevation in the resort and the prestigious location of these buildings is on the bluff called East Chop overlooking the Vineyard Sound. The area is closely identified

with the Baptist camp meetings which began congregating there in 1875. These houses are architecturally significant as fine examples of the campground construction style. Additional information regarding the assessment of the individual properties is available as part of FEMA's NHPA consultation (FEMA 2021c).

Engineered Stone Revetment

Initially installed by the Commonwealth of Massachusetts in the late 1800s with improvements during the 1930s to the 1960s, the existing structure consists of a dry-laid stone revetment of variously-sized large rocks. The revetment has been subject to multiple repairs and improvements over the past century due to regular damage from storms and coastal erosion which has removed stone and soil from the structure. The increased erosion and the recent disaster events have undermined the paved roadway to the point of imminent failure.

While the revetment may be associated with the general development of the immediate area, specifically the adjacent roadway, the development of the area would not have been precluded if the revetment was never installed. While in other towns, the installation of an oceanside revetment may be notable, in New England and specifically on Martha's Vineyard, these utilitarian structures are exceedingly common and constructed of easily accessible materials. The revetment is not known to be associated with any significant persons, and as a nondescript stone revetment it does not appear to be architecturally significant. The revetment does not have the ability to yield important information in pre- or post-contact history as modern construction techniques at the time of the improvements and increased erosion would have disturbed or removed any potential resources. Based on the prevalence of these structures throughout the area and the lack of specific association, FEMA determined that the revetment is not eligible for listing in the NRHP.

5.5.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative erosion would continue to occur along the bluff and eventually that erosion could undermine the foundations of the houses threatening the homes. As such, the No Action Alternative could result in **moderate** to **major** effects to historic standing structures.

Alternative 2: Proposed Action

The Proposed Action Alternative would have no direct effect on the historic structures located within the APE. However there are potential indirect effects, including the potential for visual effects to the setting of the East Chop Drive residences and potential vibratory effects associated with construction activites such as pile-driving. To mitigate these effects, FEMA would condition the project to ensure that a seismic meter would be used to monitor any effects on the houses within the APE. If the potential for damage to the properties is indicated by the monitor, work would need to stop while the buildings are assessed, and any necessary protective measures are implemented. Most of the proposed work would occur below-grade, or in the case of the guardrails, on the ocean-facing side of the revetment, and would have limited effects on the viewshed of these buildings, would not affect their character defining features, and would not have an adverse effect on either their integrity or eligibility for listing in the NRHP. Effects would be **minor**.

5.5.3 Archaeological Resources

5.5.3.1 Existing Conditions

To date, no archaeological resources have been found within the project area, and FEMA's initial assessment of the project area does not indicate that archaeological resources are present within the APE.

5.5.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no construction related ground disturbance, but natural erosional processes would remain. Because no archeological resources were identified within the project area, effects to archaeological resources would be **none**.

Alternative 2: Proposed Action

Under the Proposed Action Alternative, there would be no effect to archaeological resources because none were identified within the project area. Staging areas and sources of borrow and fill have not yet been identified for this project, so FEMA would condition the project to limit staging areas and borrow and fill sources to previously disturbed areas and previously licensed borrow sites. Additionally, as a standard precaution, FEMA would condition the project in the event of unanticipated archeological discoveries. Effects would be **none/negligible**.

5.6 Socioeconomic Resources

5.6.1 Land Use and Planning

5.6.1.1 Existing Conditions

Lands adjacent to theproject area are zoned single family residential (R2) for lots larger than 20,000 square feet. Two of the six parcels west of East Chop Drive and the project area are lands owned by the Town as public open space (Maps Online 2021, Martha's Vineyard Commission 2015b). East Chop Drive is one of the main access roads for the residential zone; although, of the four residences adjacent to the project area, only one residence relies on East Chop Drive for access.

5.6.1.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action Alternative, construction activity would not occur and there would be no effect on the residential area. There would be no short- or long-term effect on zoning or land use plans. Wave action and storm surge that could worsen with sea-level rise would continue to erode the bluff. Erosion could undermine East Chop Drive and the adjacent residential parcels potentially leading to damage and loss of buildings on these parcels. East Chop Drive would continue to be closed, reducing access to adjacent residential parcels. Therefore, there would be a minor negative effect on land use adjacent to the project area.

Proposed Action

Under the Proposed Action, there would be no short- or long-term effect on existing land uses or zoning and the Proposed Action would not conflict with land use plans. The stabilized bluff and revetment would reduce bluff loss and undercutting, maintaining existing land uses and improving access.

5.6.2 Noise

EPA developed federal noise-emission standards in accordance with the Noise Control Act of 1972 identifying major sources of noise and determining appropriate noise levels for activities that would infringe on public health and welfare in accordance with the law. The EPA identifies a 24-hour exposure level of 70 decibels as the level of environmental noise which would prevent any measurable hearing loss over a lifetime. Likewise, levels of 55 decibels outdoors and 45 decibels indoors are identified as preventing activity interference and annoyance. The levels are not single event, or "peak" levels. Instead, they represent averages of acoustic energy over periods of time such as 8 hours or 24 hours, and over long periods of time such as years (EPA 1974). Additionally, the Federal Highway Administration established acceptable noise levels and ranges for construction equipment (FHWA 2006) and the Occupational Safety and Health Administration established thresholds for occupational noise exposure to protect the health and safety of workers (29 C.F.R. 1926.52). Land uses that are considered sensitive to noise effects are referred to as "sensitive receptors." Noise sensitive receptors consist of, but are not limited to, schools, residences, libraries, hospitals, and other care facilities.

5.6.2.1 Existing Conditions

Existing noises in and near the project area include neighborhood traffic, motorboat engines from the marina (over 1,000 feet away), and wind and waves. The closest sensitive receptors to the project area are single-family homes, some of which are less than 50 feet from the project area. The Town's bylaws restrict any noise that can be heard from 150 feet away from 11:00 p.m. to 8:00 a.m. (Town of Oak Bluffs 2018).

5.6.2.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, construction-associated noise would not occur. Wave noise would continue and East Chop Drive would not be reopened to the public. Rerouted traffic would continue to be diverted through the neighborhood, including emergency vehicle traffic, resulting in negligible recurring short-term adverse effects on noise levels.

Proposed Action

Under the Proposed Action, construction activities would temporarily increase noise levels in the project area and vicinity but are not expected to exceed EPA standards or regulatory thresholds established by FHWA and OSHA. Adherence with these standards would minimize sound exposure and ensure noise levels would not cause hearing impairment or permanent damage for workers. Construction-related noise would occur during normal waking hours in accordance with the Town's noise time restriction ordinance (Chapter 10, Section E). Therefore, there would be a minor short-term increase in noise levels during construction. Post-construction, noise levels would return to pre-construction levels and reduce the potential for noise related to emergency road repairs and emergency vehicle rerouting. Therefore, the Proposed Action would have a minor long-term beneficial effect related to noise.

5.6.3 Public Services and Utilities

5.6.3.1 Existing Conditions

Electrical utilities in the project area are provided by Eversource (previously NSTAR) and are delivered to the project area via overhead powerlines (Eversource 2021). Water systems in the project area are operated and maintained by the Oak Bluffs Water District, a nonprofit, locally controlled public water system, and are below ground (Oak Bluffs Water District 2021). The closest school is Oak Bluffs Elementary school, approximately 1.38 miles to the south.

Existing stormwater infrastructure within the project area includes two catchment basins that discharge into Nantucket Sound: one at the intersection with Harrison Avenue and one approximately halfway between Harrison Avenue and Brewster Avenue (see **Section 4.2**). The drainage outfalls associated with these basins have been damaged by the extensive erosion of the coastal bank.

5.6.3.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, construction activities would not occur and there would be no effect on local utility services. The bluff and revetment would not be stabilized and wave action that could worsen with future sea-level rise would continue to erode the bluff and undermine East Chop Drive, potentially damaging electric utilities adjacent to the road. The existing failing catchment basins would not be replaced, would continue to deteriorate, and would likely not adequately drain and filter stormwater. Underground water and wastewater infrastructure further inland would be unlikely to be affected because of their distance from the bluff. Schools are not present within the project area or vicinity and would not be affected. Thus, there would be no short-term effect on public services and utilities and a potential minor long-term adverse effect from the continued closure of East Chop Drive and erosion of the bluff near electric utilities.

Proposed Action

Under the Proposed Action, construction activities would have no effect on electric or gas utilities. There would be a temporary closure of the two catchment basins during replacement, resulting in a temporary adverse effect on stormwater drainage during the construction period that would be mitigated through implementation of CWA permit-required BMPs. Underground water and wastewater infrastructure further inland would not be affected. There would be no effects on schools because of the distance that schools are from the project area. Replacing the catchment basins would improve the drainage and filtration of stormwater into Nantucket Sound, thus improving long-term stormwater management along East Chop Drive. Stabilization of the bluff would allow East Chop Drive to be repaired and safely reopened, restoring access for maintenance and repair vehicles. The stabilized bluff would also protect electric utilities from erosion-related damage. Therefore, the Proposed Action would have a negligible short-term adverse effect on public services during the replacement of catchment basins and a minor long-term beneficial effect from the reduced risk of erosion and its associated effects on public services and utilities.

5.6.4 Public Health and Safety

5.6.4.1 Existing Conditions

The project area and vicinity is served by the Oak Bluffs Fire and Emergency Medical Services (EMS) Department and the Oak Bluffs Police Department. Fire and EMS personnel are housed in a single location, approximately 1.5 miles southwest from the project area and police services are approximately 0.65 miles south of the project area. The Martha's Vineyard Hospital is approximately 1.07 miles west of the project area, see **Appendix A: Figure 7**.

5.6.4.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, there would be no construction activity and thus no effect on emergency response vehicles or times from construction-related detours or lane closures. East Chop Drive would remain unsafe to re-open and adjacent residences could experience longer emergency response times. Bluff erosion would continue to occur and over time nearby residences and private property would be at risk of damage. Therefore, there would be a minor long-term adverse effect on public health and safety from the continued closure of East Chop Drive and associated risk to adjacent properties.

Proposed Action

Under the Proposed Action, construction staging areas would be located along the presently closed East Chop Drive and would not require additional road closures. Thus, no change in emergency response times would occur due to construction-related activity. Post-construction, bluff stabilization would allow for the repair and re-opening of East Chop Drive, allowing emergency and police vehicles direct access to properties along the bluff. Therefore, there would be a minor short-term adverse effect on emergency response times as the currently closed East Chop Drive would remain closed until project completion. There would be a negligible long-term beneficial effect on public health and safety from the reopening of East Chop Drive, which would allow for easier emergency service access to the area. The stabilization of the bluff would provide a long-term reduction in the risk of property damage to adjacent residences.

5.6.5 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires agencies to identify and address disproportionately high and adverse human health or environmental effects its activities may have on minority or low-income populations. The Commonwealth of Massachusetts also considers those with Limited English Profiency during environmental justice analysis. The EPA Environmental Justice Screening and Mapping Tool (EJ Screen), the Massachusetts Environmental Justice Viewer (MEJV), and census data was used to evaluate the demographic characteristics of the project area and surrounding community. The EJ Screen analysis is based on the U.S. Census Bureau 2015 to 2019 American Community Survey 5-year summary data at the census block group level (EPA 2021c).

Minority, low-income, and limited English proficiency populations, as defined by the Commonwealth of Massachusetts, are defined as meeting either or all of the following criteria:

- Block group whose annual median household income is equal to or less than 65 percent of the statewide median (Current median income is $62,072 from 2010 census data); or
- 25 percent or more of the residents identify as a race other than white; or
- 25% or more of households have no one over the age of 14 who speaks English only or very well - English Isolation

5.6.5.1 Existing Conditions

According to EJ Screen, MEJV, and census data, the project area's census block group 250072002991 does not contain an environmental justice low-income, minority, or limited English proficiency population because it does not meet the criteria listed above (**Table 5.3**) (EPA 2021c). Thus, environmental justice populations are not expected to be present adjacent to or near the project area.

Table 5-3: Environmental Justice Demographics

Area	Percent Minority Population	Median Household Income	Percent Limited English Proficiency
Block Group: 250072002001	5%	$81,838	0%
Commonwealth of Massachusetts (2019)	28%	$81,215	6%

5.6.5.2 Potential Effects and Proposed Mitigation

No Action Alternative

Under the No Action alternative, the bluff would not be stabilized and East Chop Drive would remain closed. Access along East Chop Drive would remain restricted due to its continued closure. Since there are no environmental justice communities in or near the project area, they would not be effected. Therefore, the No Action alternative would not result in a disproportionately high or adverse effect on environmental justice communities.

Proposed Action

Under the Proposed Action, construction noise and activity would not be expected to affect environmental justice populations as they are not present within or in close proximity to the project area. Similarly, there would be no effect to environmental justice populations post construction. Therefore, there would be no disproportionately high or adverse effects on environmental justice populations and no effect.

5.7 Cumulative Effects

This SEA considers the overall cumulative effect of the Proposed Action and other actions that are related in terms of time or proximity. While consideration of cumulative effects is no longer required under NEPA regulations as of September 14, 2020, the cumulative effects text is retained in this document for added perspective. Cumulative effects represent the "effect on the environment which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 C.F.R. 1508.7 pre-2020). In the context of evaluating the scope of a proposed action, direct, indirect, and cumulative effects are considered. In addition to NEPA, other statutes require federal agencies to consider cumulative effects. These include CWA Section 404(b)(1) guidelines, the regulations implementing the conformity provisions of the Clean Air Act, the regulations implementing Section 106 of the NHPA, and the regulations implementing Section 7 of the ESA.

The Proposed Action would be the first of two phases to restore and improve the existing revetment along East Chop Drive. The second phase would extend north from the project area for an additional 1,200 feet along the bluff between Harrison Avenue and Munroe Avenue. The second phase would address a section of the bluff that is less eroded and where East Chop Drive remains open for vehicular use. The work under Phase 2 would be an independent action as described in **Section 3**. The source of funding and timing of the second phase has not been determined**.** No other known projects are proposed or planned.

Phase 2 would include similar design characteristics as Phase 1 including:

- Repairing and expanding the existing revetment both landward and seaward to a total footprint expansion of 65 percent
- Reducing the slope of the bluff by regrading from 34 degrees to 27 degrees
- Replanting between the top of the revetment and East Chop Drive with native salt-tolerant vegetation

Cumulatively, Phases 1 and 2 would result in the following:

- Placement of approximately 15,500 square feet of fill consisting of riprap for the repair and rehabilitation of the existing revetment
- Discharge of approximately 11,158 cubic yards of riprap material over approximately 34,500 square feet
- An area of new fill seaward of the existing footprint of the revetment totaling 8,986 square feet

Anticipated adverse and beneficial effects for both phases were considered in the USACE EA for the work that would occur up to the HTL. Adverse and beneficial effects for Phase 2 landward of the HTL would be similar to those described for Phase 1, the Proposed Action, because of the similar nature of the hazards and project activities.

Cumulatively, Phases 1 and 2 would protect approximately 2,400 linear feet along the East Chop Bluff shoreline from erosion due to wave action, storm surge, and future sea-level rise. Reducing the risk of erosion would protect adjacent properties and infrastructure. Each phase of the project would protect its associated section of the bluff and East Chop Drive and is not dependent upon completion of the other section to provide erosion protection or meet the purpose of the project. However, the projects when

considered together may have cumulative effects on environmental resources along the bluff and Nantucket Sound. Water quality and EFH could be affected when considering the cumulative effects of both projects.

- **Water Quality** – Phase 2 is covered under the same USACE permit, MA DEP permit, and MA DEP Order of Conditions described in **Section 5.2.1.** As long as the Town complies with all BMPs and permit conditions of the issued permits and authorizations, the combined construction-related effect would still be a minor short-term adverse effect on water quality. Implementation of the Proposed Action and the Phase 2 project landward of the HTL would reduce soil erosion and increase stormwater filtration as Phase 2 would have similar vegetation and slope stabilization measures. Therefore, the combined projects would have a minor long-term benefit on water quality from the larger area of reduced erosion and increased stormwater filtration and drainage.
- **EFH** – Phase 2 would also include conversion of intertidal substrate into engineered stone, which would result in additional permanent loss of EFH. Phase 2 was included in the USACE consultation with NMFS, and mitigation for this Phase 2 effect is included the required ILF compensation. As a result, the combined effect of loss of EFH habitat would be a minor long-term adverse effect that would be compensated by the ILF payment. There would be a negligible long-term beneficial effect from the reduced erosion and sedimentation resulting from the stabilized bluff and improved quality of stormwater runoff over a larger area, similar to the cumulative effect on water quality.

In addition to the repairs to East Chop Drive between Brewster Avenue and Harrison Avenue under the Proposed Action, the road would also be repaired, as needed, in the Phase 2 area once Phase 2 was completed. Repairs to the two road segments would be independent projects and there would be no cumulative effects because construction on the two road segments would be separated spatially and temporally. There would be no effects on resources such as water quality or marine resources from the road repairs.

6.0 PERMITS AND PROJECT CONDITIONS

The Town is responsible for obtaining all required federal, state, and local permits. While a good faith effort was made to identify all necessary permits for this SEA, the following list may not include every approval or permit required for this project. Before, and no later than, submission of a project closeout package, the Town shall provide FEMA with a copy of the required permits from all pertinent regulatory agencies.

Additionally, FEMA would require the Town to adhere to the following conditions during project implementation. Failure to comply with grant conditions may jeopardize federal funds.

1. Comply with all conditions within the USACE EA, approved January 21, 2020.
2. Comply with the conditions of Department of the Army permit NAE-2017-01616 issued by USACE for construction of the Resilient Infrastructure for East Chop Drive under Section 10 of the Rivers and Harbors Act and Section 404 of the CWA; and the MADEP permit for Chapter 91 and Section 401 Water Quality (permit 15069 dated October 23, 2019).
3. Comply with all conditions of the Massachusetts Wetlands Protection Act Order of Conditions issued by the Town of Oak Bluffs Conservation Commission for MassDEP File Number SE53-0766, dated July 5, 2018
4. Before construction begins, the Town shall coordinate with EPA to determine if an NPDES permit under Section 402 of the CWA is required.
5. Before construction begins, the Town shall coordinate with Massachusetts Coastal Zone Program for a Coastal Consistency Determination for the proposed work landward of the high tide line.
6. The management of woody debris would follow all European gypsy moth USDA quarantine guidelines.
7. Install staked hay bales along the top of the revetment to prevent debris and sediments from blowing/eroding into Nantucket Sound.
8. A floating boom shall be installed along the lengths of work sections (typically 10 to 200 feet in length) to trap any potential floating debris.
9. During construction, all sedimentation/erosion control barriers shall remain in stable condition at all times.
10. The work site shall be cleaned of debris and accumulated soils to prevent wind deposition of fugitive dust and debris at the close of each day.
11. Prior to the start of construction, the Town shall provide FEMA and USACE with a written description of erosion/sedimentation control methods to be used during the project.
12. All staging areas shall be limited to previously disturbed areas.
13. All borrow sites shall be limited to previously licensed borrow sites.
14. In the event of the discovery of archaeological deposits and/or human remains, the subrecipient and their contractor shall immediately stop all work in the vicinity of the discovery and take reasonable measures to avoid or minimize harm to the finds. The subrecipient shall immediately report the archaeological discovery to FEMA and MEMA.
15. A seismic meter shall be used to monitor construction-related effects to houses within the project area. If the potential for damage to the properties is indicated by the monitor, work shall stop while the buildings are assessed, and any necessary protective measures are implemented.

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

NEPA and FEMA procedures stress the importance of engagement with partner agencies, applicants, and the public, to the extent practicable, while preparing an SEA. To solicit input on the project and its potential effects, FEMA distributed a SEA scoping document to the following agencies on April 15, 2021:

- EPA, Region 1 Office of Environmental Review
- U.S. Department of Housing and Urban Development, Region 1 Environmental Office
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration
- USFWS
- USACE
- U.S. Department of Agriculture
- Commonwealth of Massachusetts
- Town of Oak Bluffs

Following distribution of the scoping document, FEMA received correspondence from the agencies. The correspondence is summarized in **Table 7.1.**

Table 7-1: Correspondence Summary

From	Date	Subject
EPA-R1	April 20, 2021	No scoping comments to offer but would appreciate the opportunity to review the SEA when it is available.
Massachusetts Department of Environmental Protections	May 10, 2021	Scoping was reviewed against NHESP progams and policies. No requirement to file the project for review with the MA Endangered Species Act.

The draft SEA was made available for agency and public review and comment for a period of 15 days, from August 6th through the 21st. A public notice of the availability of the draft SEA for review was published in the Vineyard Gazette. An electronic copy was made available for review on the town website at: https://www.oakbluffsma.gov/DocumentCenter/View/6451/Oak-Bluffs-MA-SEA-Resilient-Infrastructure-Draft-East-Chop-Drive. A hard copy of the draft SEA was provided at the Town Hall at 53 School Street, Oak Bluffs, MA 02557.

FEMA sent a notification regarding the availability of the draft SEA for review and comment to the agencies who received the scoping document. There were no substantive comments received during the public comment period on the draft SEA.

8.0 LIST OF PREPARERS

CDM Smith:

- Annamarie Weddle (Environmental Planner)
- Brandon Webb (Environmental Planner)
- Malena Foster (Geograhic Interface System Sepcialis)
- Kate Stenberg, PhD (Senior Quality Assurance/Quality Control Reviewer)

FEMA:

- David Robbins (Regional Environmental Officer)
- Mary Shanks (Deputy Regional Environmental Officer)
- Eric Kuns (Senior Environmental Specialist)
- Kimberly De Muro (Lead Environmental Specialist)
- Brent Wacho (Environmental Specialist)
- Joshua Helms (Environmental Specialist)
- Kathleen Philp (Environmental Specialist)
- Kathryn Emmitt-Peabody (Environmental Specialist)
- Krista Richardson-Cline (Environmental Specialist)
- Meredith Fagan (Environmental Specialist)

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_____. 2021d. Consultation concurrence letter from Brona Simon, Massachusetts State Historic Preservation Officer to FEMA. Recommendation for Project Conditions and Determination of "No Historic Properties Affected," Resilient Infrastructure for East Chop Drive. Dated June 21, 2021.

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Appendix A Maps and Figures

Figure 1: Project Vicinity Map

Figure 2: Project Location Map

Figure 3: Project Soils Map

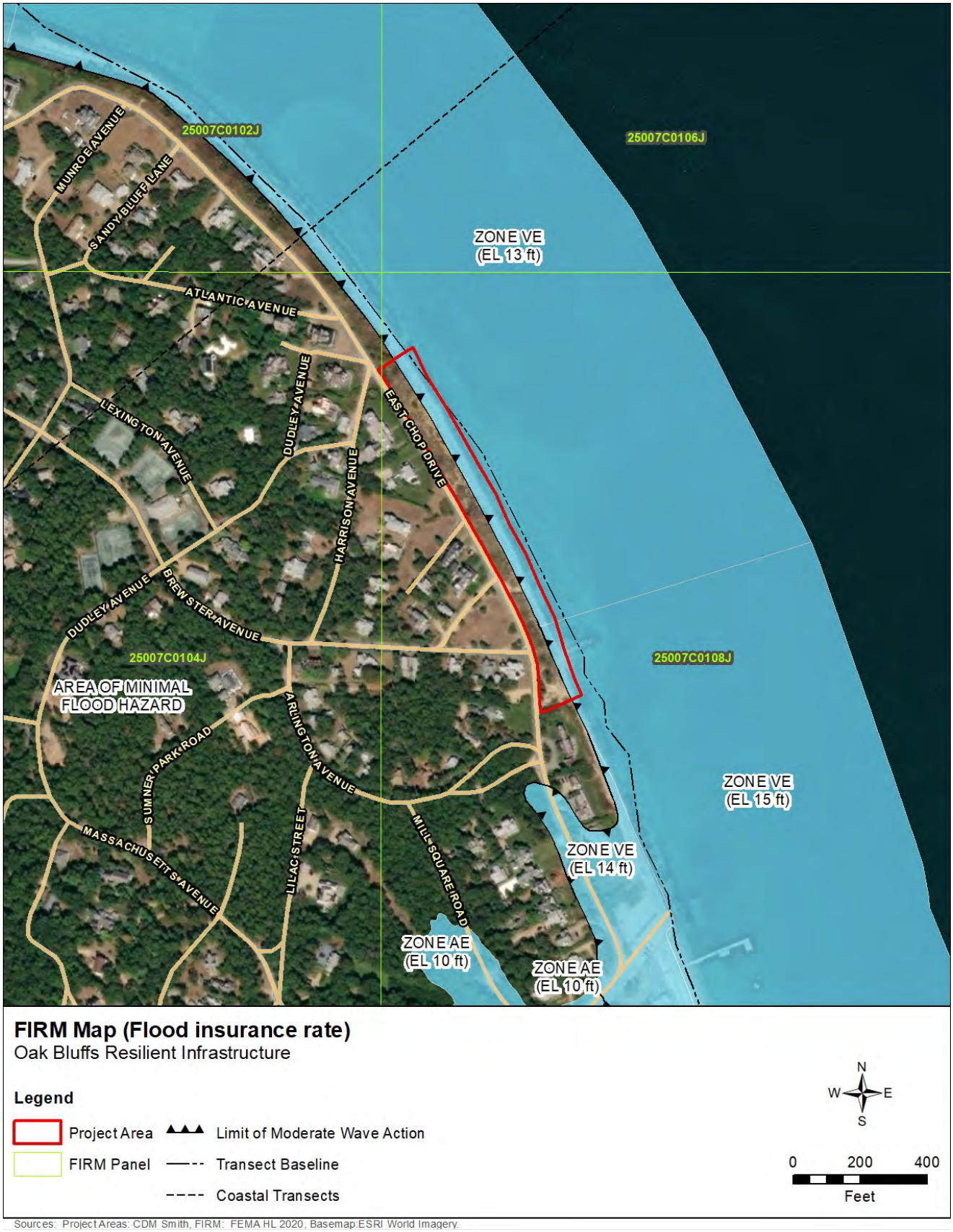


Figure 4: FIRM

Figure 5: Coastal Zone Map

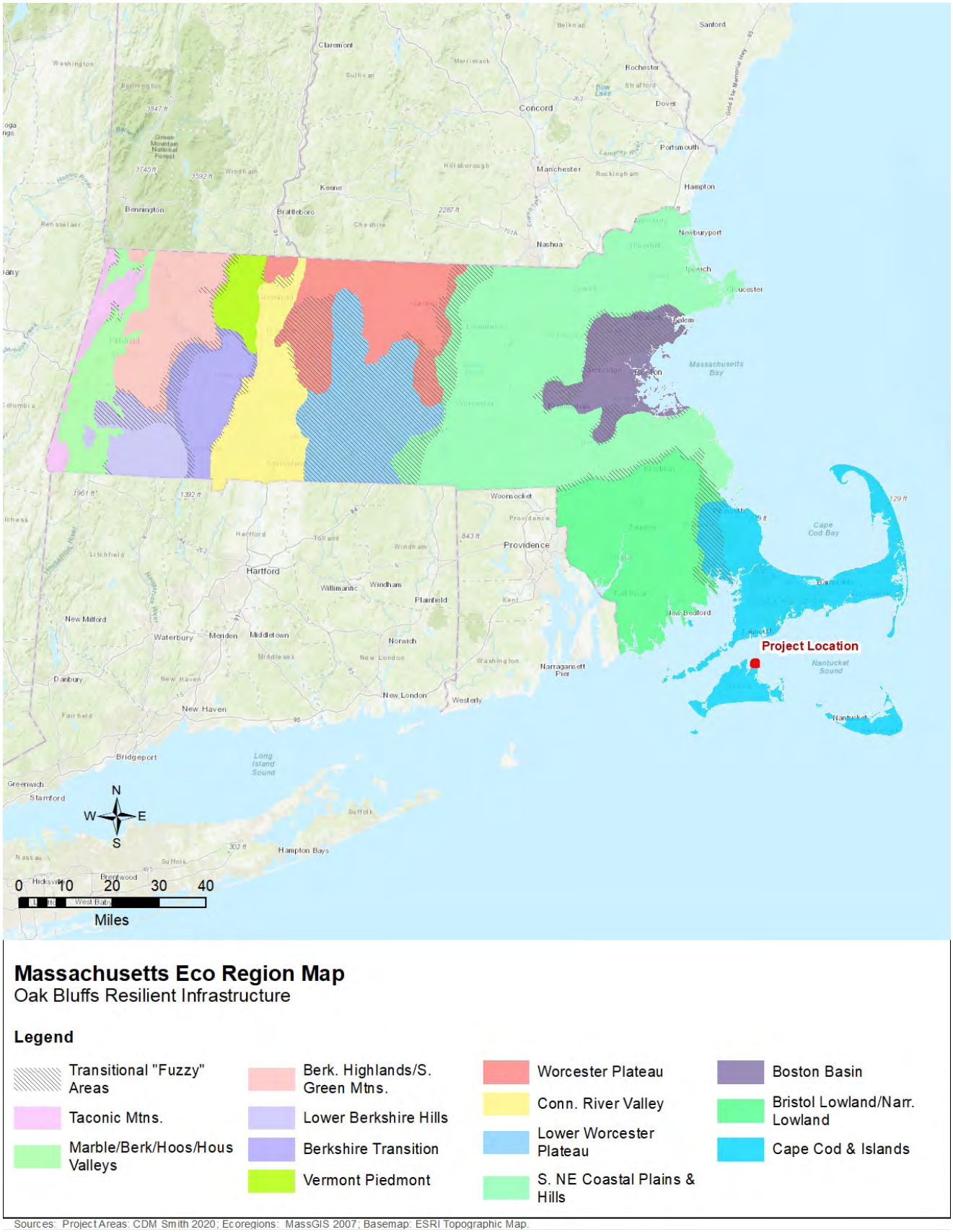


Figure 6: Massachusetts Eco Region Map

Figure 7: Public Health and Safety Facilities Map

Appendix B Documents

Document 1

East Chop Bluff Improvement Plans

MATCH LINE

EEL GRASS SURVEY TRACKS (TYP) (2016)

NANTUCKET SOUND

FLOOD

EBB

AHTL=1.54'

MLW=-.56'

MHW=1.14'

FEMA VE ZONE EL. 14.3 (NGVD29)

FEMA VE ZONE EL. 16.3 (NGVD29)

COASTAL BEACH

EXISTING JETTY

EXISTING TOE OF REVETMENT

EXISTING RIP RAP

ERODED AREA (TYP.)

PROP. 1.5H:1V SLOPED REVETMENT (TYP.)

LAND UNDER OCEAN

EXISTING TIMBER RETAINING WALL

FEMA VE ZONE EL. 14.3 NGVD29

+11.0

12' WIDE CONSTRUCTION ACCESS ROAD

+25.8

EXISTING SCOUR LINE

EXISTING TOP OF SLOPE

PROP. 5' WIDE BENCH OF REVETMENT EL. +20

PROPOSED VEGETATED FIEL AREA (2H:1V)

EXISTING REVETMENT

PROP. DISCHARGE PIPE W/ DIFFUSER (TYP.)

EXISTING EDGE OF ROAD

EXISTING PAVEMENT LIMIT TO REMAIN

RIGHT OF WAY

PROPERTY BOUNDARY (TYP)

EXISTING PROPERTY LINE (TYP)

PROPOSED 5' WIDE ADA ACCESS RAMPS 12H:1V

PROPOSED 4' WIDE ASPHALT SHOULDER & BIKE RACK

PROPOSED 5' WIDE x 55' LONG ADA CONC. PATH (1:20 MAX. SLOPE) W/ ADJACENT 2'x2'x2' CRUSHED STONE TRENCH

PROP. 1.5H:1V SLOPED REVETMENT (TYP.)

PROP. 5' WIDE BENCH OF REVETMENT EL. +20

PROPOSED GUARDRAIL

SAW CUT (TYP.)

PROPOSED TWO-WAY TRAFFIC

PROPOSED CATCH BASINS RIM EL.=47.5'±

EXISTING VEGETATED BERM TO BE RESTORED AS NEEDED

100' BUFFER ZONE

PROPOSED CATCH BASIN RIM EL.=47.2'±

PROPERTY LINE (TYP.)

EAST CHOP DRIVE

WESTON AVE.

HARRISON AVE.

BREWSTER AVE.

0+50

1+00

2+00

3+00

4+00

5+00

6+00

7+00

8+00

9+00

10+00

11+00

12+00

13+00

GRAPHIC SCALE

0 20 40 80

(IN FEET)
1 INCH = 80FEET

CARLOS G. PEÑA CIVIL No. 36206 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
2/5/18

SURVEY NOTES:

1. PROJECT NAME:	HYDROGRAPHIC SURVEY
2. PROJECT NUMBER:	09027.300 & 13021.300
3. PLOT SCALE:	1"=80'
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.

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

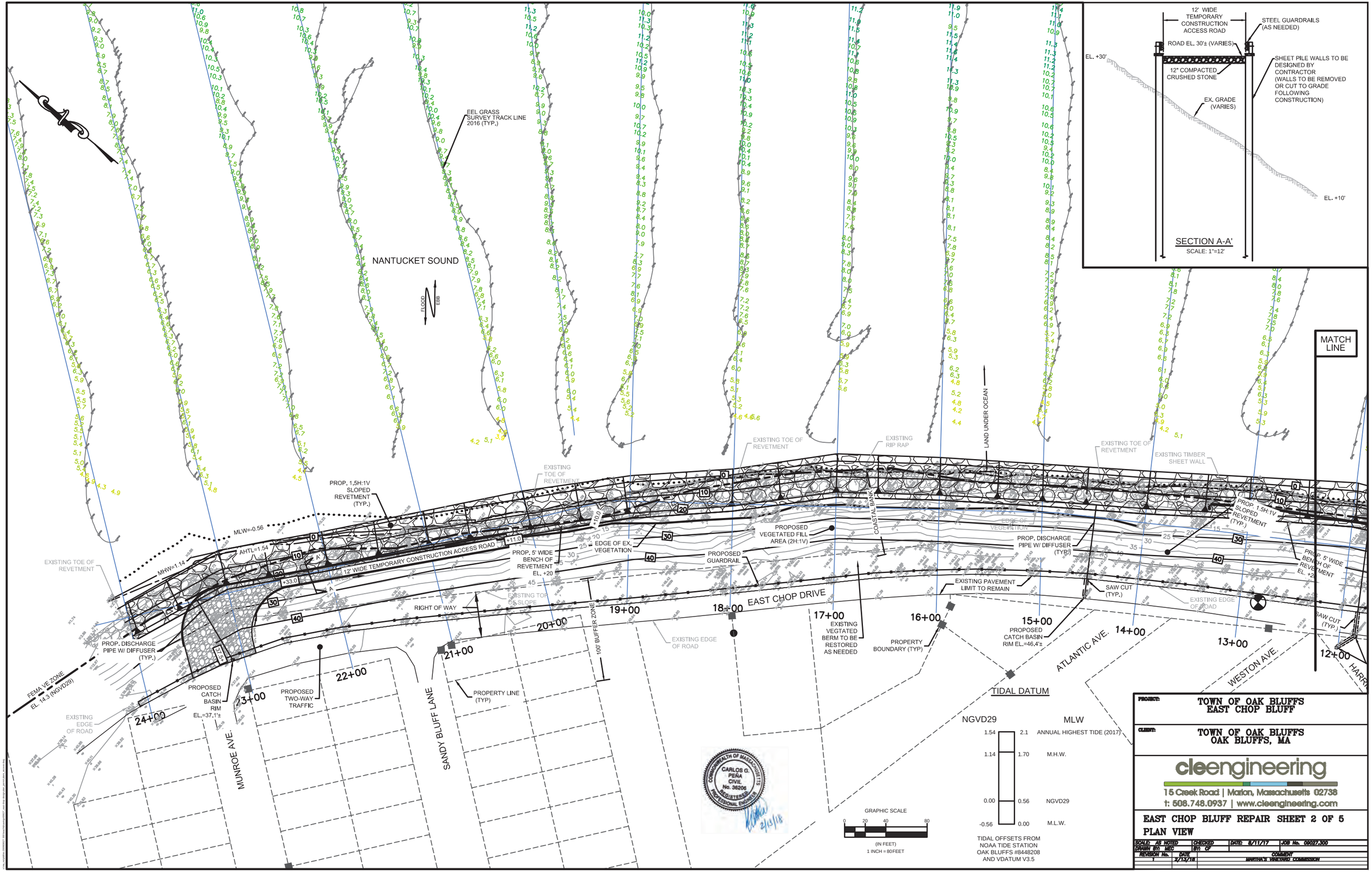
CLIENT: TOWN OF OAK BLUFFS OAK BLUFFS, MA

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

EAST CHOP BLUFF REPAIR SHEET 1 OF 5
PLAN VIEW

SCALE: AS NOTED	CHECKED	DATE: 8/11/17	JOB No. 09027.300
DRAWN BY: MED	BY: GF		

REVISION No.	DATE	COMMENT
1	2/15/18	MARTHA'S VINEYARD COMMISSION



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 5
PLAN VIEW

SCALE: AS NOTED	CHECKED	DATE: 8/11/17	JOB No. 09027.300
DRAWN BY: MEC	BY: CP		

REVISION No.	DATE	COMMENT
1	2/15/18	MARTHA'S VINEYARD COMMISSION

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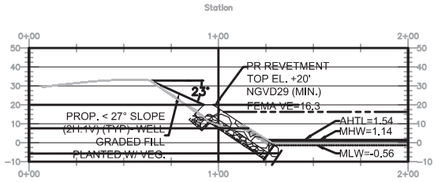

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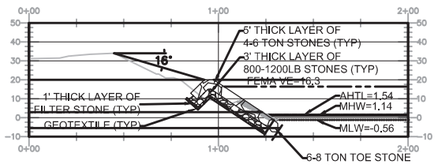

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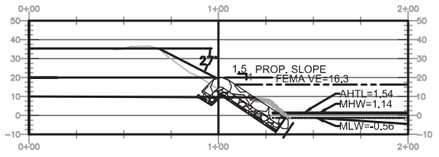

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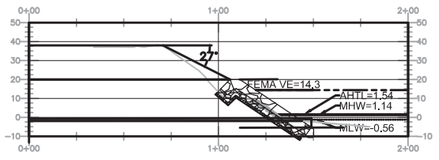

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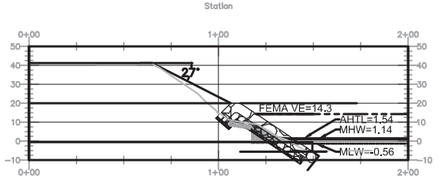

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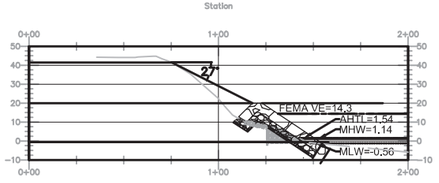

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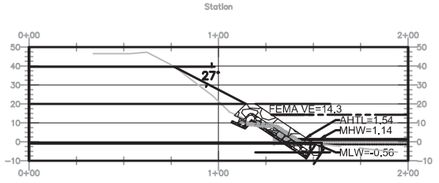

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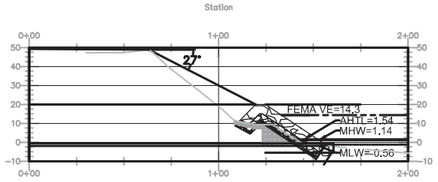

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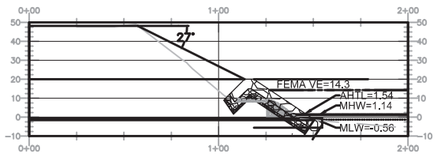

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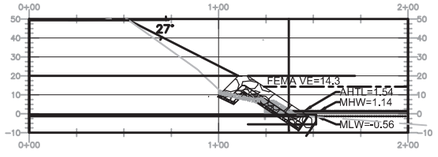

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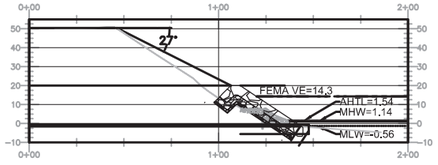

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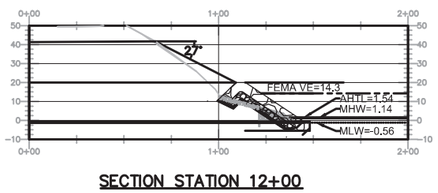

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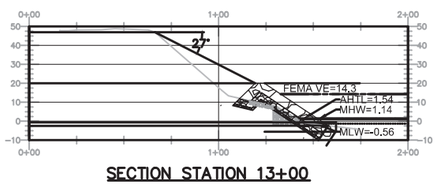

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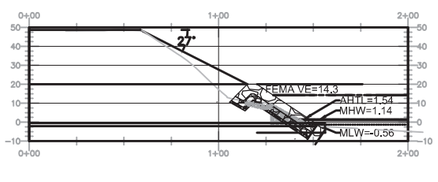

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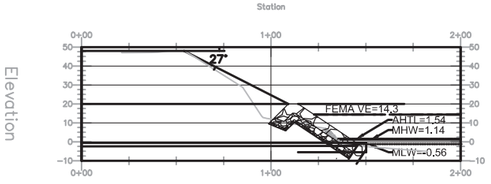

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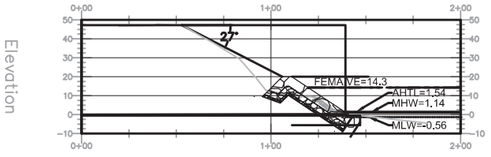

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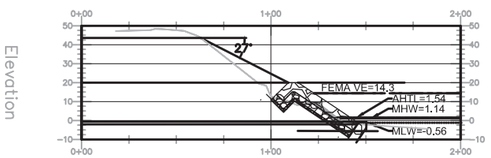

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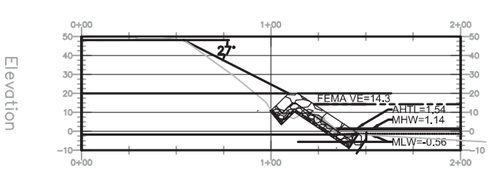

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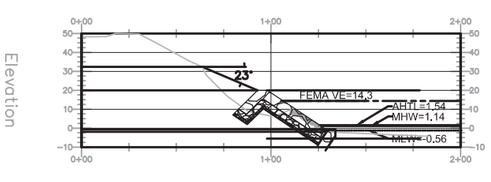

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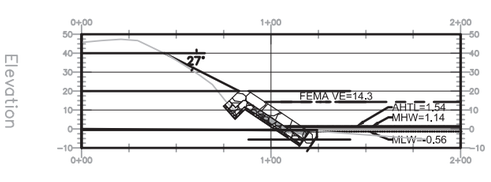

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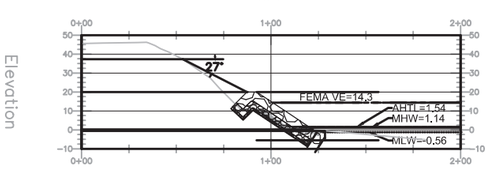

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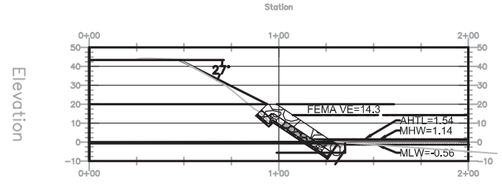

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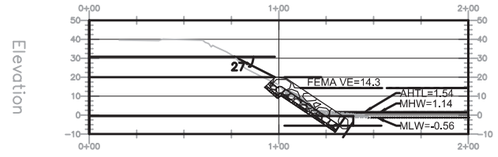

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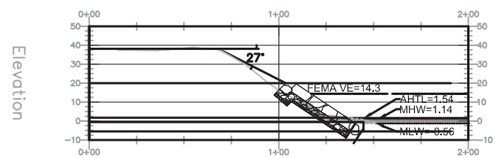

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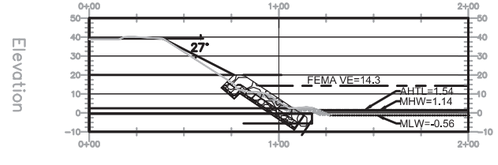
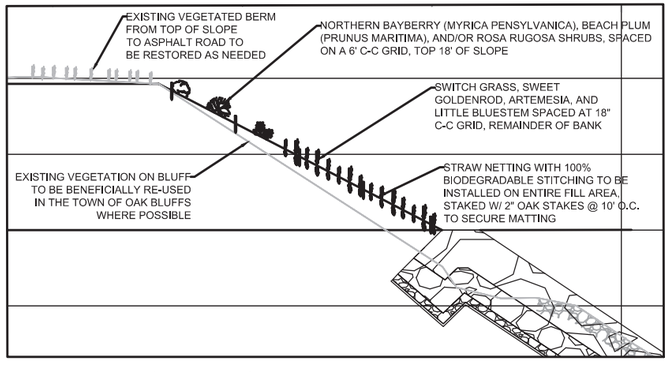




VEGETATION PLANTING DETAIL

SCALE: 1"=20'

SECTION VIEWS

SCALE: 1"=80'

CARLOS G. PEÑA
CIVIL
No. 36206
REGISTERED
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
2/13/18

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 20FEET

GRAPHIC SCALE
0 20 40 80
(IN FEET)
1 INCH = 80FEET

PROJECT:
TOWN OF OAK BLUFFS
EAST CHOP BLUFF

CLIENT:
TOWN OF OAK BLUFFS
OAK BLUFFS, MA

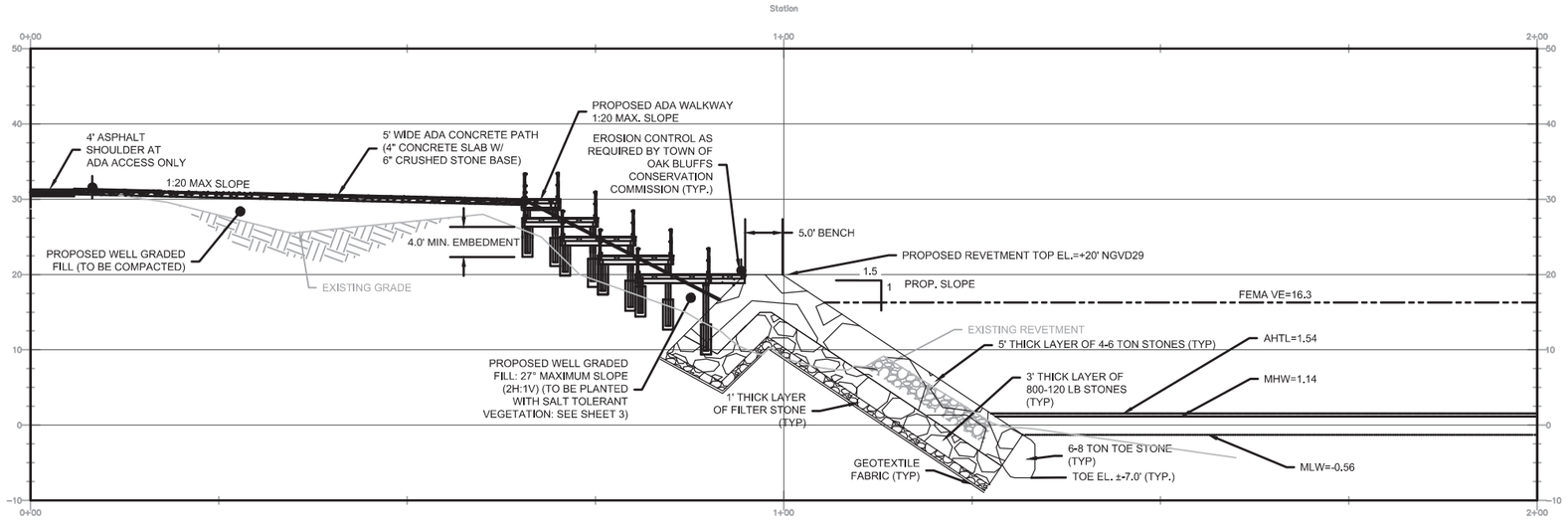
cleengineering
15 Creek Road | Marion, Massachusetts 02738
t: 508.748.0937 | www.cleengineering.com

EAST CHOP BLUFF REPAIR SHEET 3 OF 5
SECTIONS & DETAILS

SCALE: AS NOTED	CHECKED	DATE: 8/11/17	JOB No. 08027.300
DRAWN BY: MEC	BY: CP		

REVISION No.	DATE	COMMENT
1	2/13/18	MARTHA'S VINEYARD COMMISSION

ADA PATH AND ACCESS RAMP PROFILE (STA 0+55 +/-)

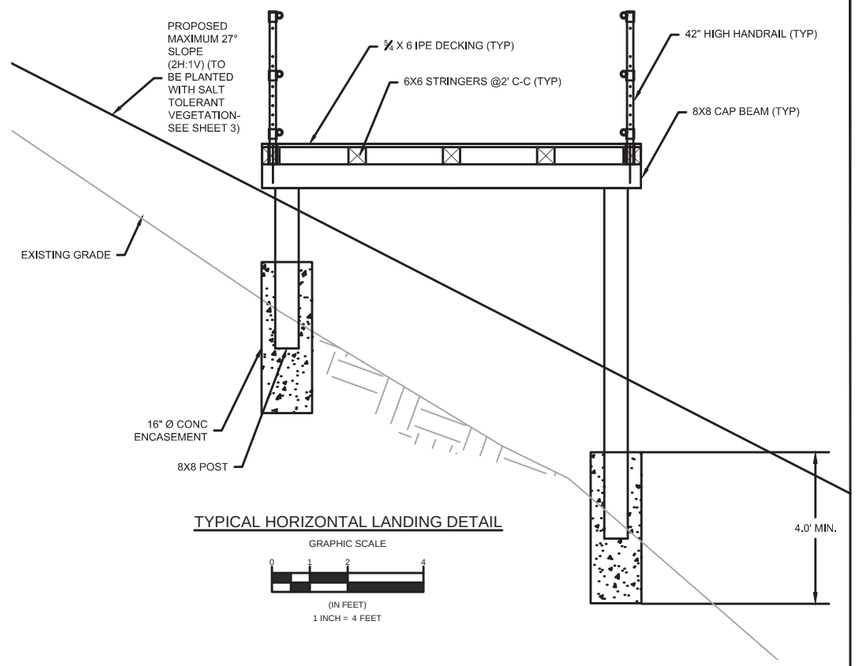


ACCESS RAMP DETAIL

GRAPHIC SCALE

0 5 10 20

(IN FEET)
1 INCH = 20FEET

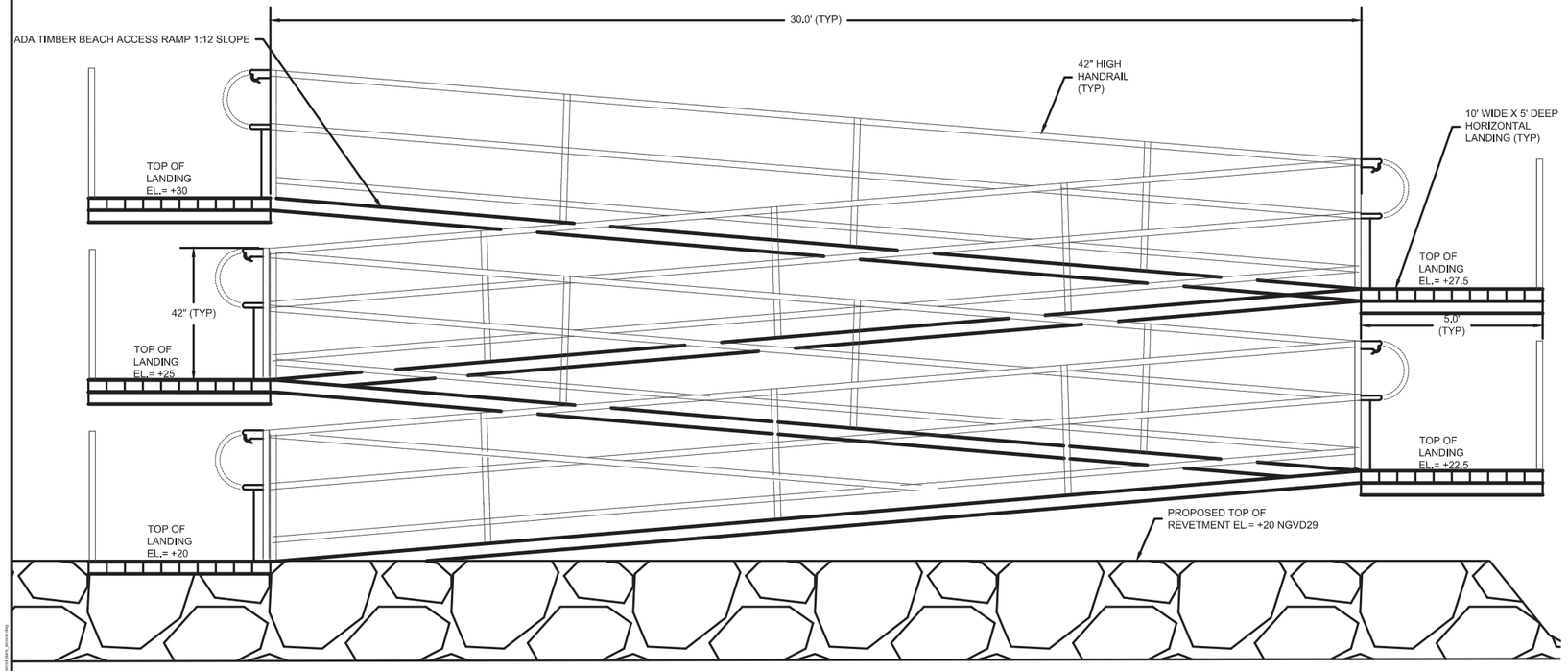


TYPICAL HORIZONTAL LANDING DETAIL

GRAPHIC SCALE

0 1 2 4

(IN FEET)
1 INCH = 4 FEET

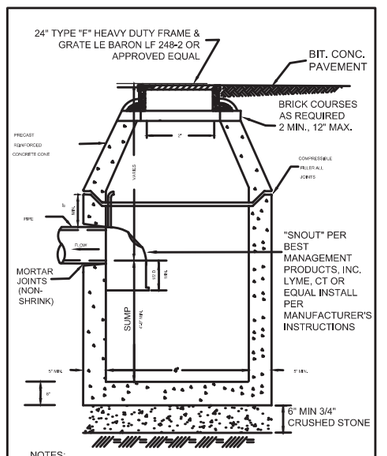


ACCESS RAMP PROFILE

GRAPHIC SCALE

0 1 2 4

(IN FEET)
1 INCH = 4 FEET



NOTES:
1) ALL CATCH BASINS SHALL MEET THE REQUIREMENTS OF THE TOWN OF OAK BLUFFS DPW.
2) EACH CATCH BASIN SHALL BE EQUIPPED WITH A JELLYFISH FILTER CATCH BASIN INSERT (OR APPROVED EQUAL) INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION

TYPICAL PRECAST CONCRETE CATCH BASIN WITH HOOD

NOT TO SCALE

COMMONWEALTH OF MASSACHUSETTS
CARLOS G. PEÑA
CIVIL
No. 36206
REGISTERED PROFESSIONAL ENGINEER
2/13/18

PROJECT: **TOWN OF OAK BLUFFS EAST CHOP BLUFF**

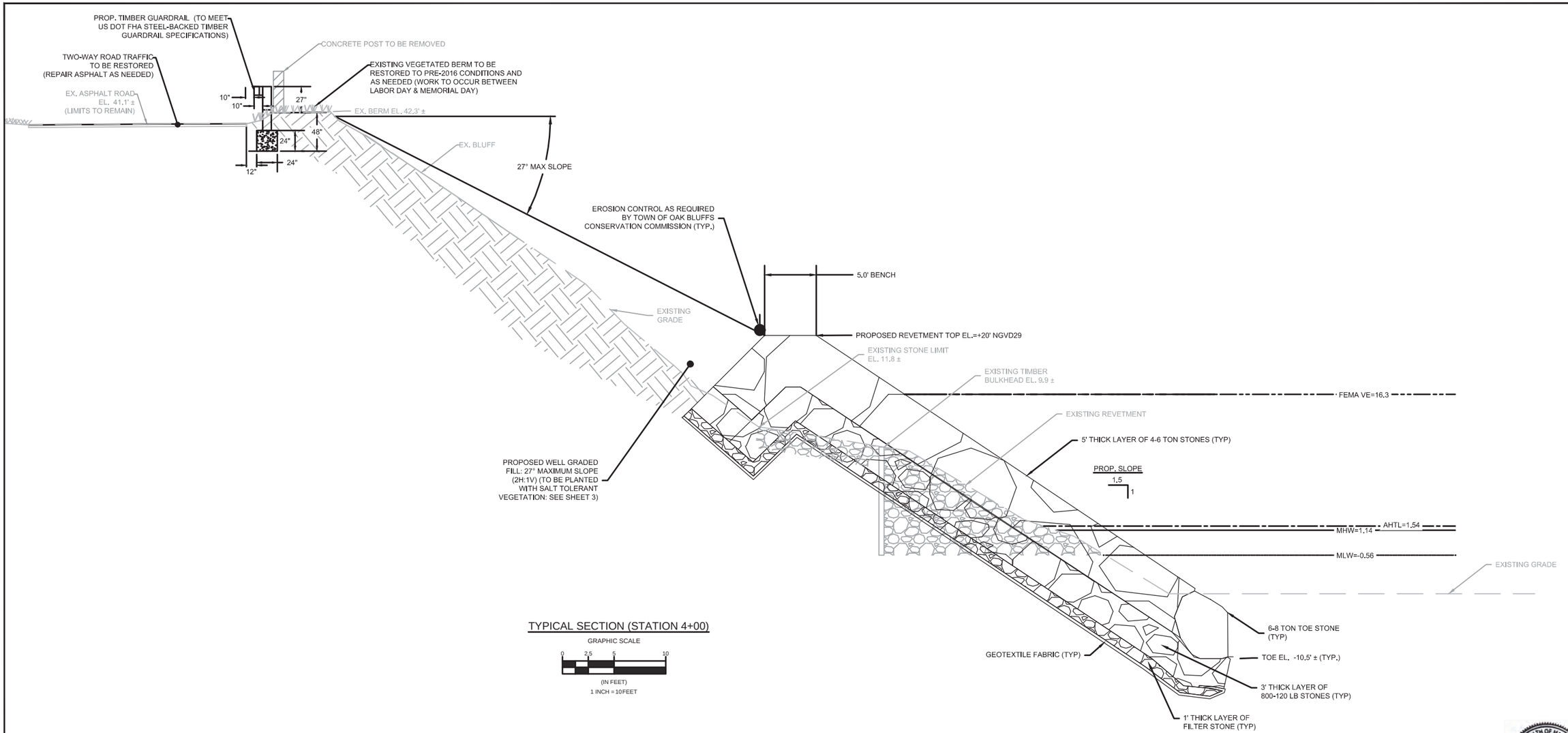
CLIENT: **TOWN OF OAK BLUFFS OAK BLUFFS, MA**

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

EAST CHOP BLUFF REPAIR SHEET 4 OF 5 DETAILS

SCALE: AS NOTED	CHECKED	DATE: 8/11/17	JOB No. 09027.300
DRAWN BY: MEC	BY: CP		

REVISION No.	DATE	COMMENT
1	2/13/18	MARTHAS VINEYARD COMMISSION



TYPICAL SECTION (STATION 4+00)

GRAPHIC SCALE

0 2.5 5 10

(IN FEET)

1 INCH = 10FEET

CARLOS G. PEÑA CIVIL No. 36206 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
2/13/18

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 5 OF 5
DETAILS

SCALE: AS NOTED	CHECKED	DATE: 02/13/2018	JOB No. 09027.300
DRAWN BY: MEC	BY: CF		

REVISION No.	DATE	COMMENT
1	02/13/18	MARTHAS VINEYARD COMMISSION

Document 2

8-Step Floodplain Review

EXECUTIVE ORDER 11988 FLOODPLAIN MANAGEMENT 8-STEP ANALYSIS (44 CFR PART 9)

TITLE: Resilient Infrastructure for East Chop Drive

LOCATION: Town of Oak Bluffs, Dukes County, Massachusetts at 41.4669, -70.5617

PROPOSED ACTION: The Proposed Action would reconstruct the existing revetment along East Chop Bluff and extend it seaward. This includes replacement of two drainage culverts, regrading East Chop Bluff, and planting the revetment with native salt-tolerant vegetation.

DESCRIPTION OF PROJECT: Under the Proposed Action, approximately 1,200 linear feet of the East Chop Bluff armored shoreline revetment would be reconstructed in Oak Bluffs, MA between Brewster Avenue to the south and Harrison Avenue to the north. The purpose of this project is to reduce erosion hazards to East Chop Drive and infrastructure in the area from storm surge and sea level rise. The revetment would be extended both landward and seaward to increase the footprint an additional 65 percent. The expanded footprint would provide an adequate base for increasing the revetment height approximately 8 to 12 feet to approximately 5.7 feet above the 100-year flood elevation. The existing revetment slope would be reduced from 34 to 27 degrees through regrading. The bluff above the stone revetment up to the East Chop Drive guardrail would be planted with native salt-tolerant vegetation and would also be stabilized with well-graded fill and angular armor stones. Existing East Chop Drive drainage outfalls would be rebuilt, including two catchment basins: one at the intersection with Harrison Avenue and one approximately halfway between Harrison Avenue and Brewster Avenue. A 12-foot-wide construction access road would be built adjacent to and seaward of East Chop Drive and would be made of compacted crushed stone supported by sheet pile walls. The road would be temporary and removed after project implementation. The Proposed Action also includes construction of a 55-foot-long concrete path at the southern end of the project area from the edge of East Chop Drive to a landing at the revetment bench top. The path would be compliant with the Americans with Disabilities Act (ADA) and include a 5-foot ramp at the end to allow recreational access to fishing and swimming spots.

STEP 1 Determine whether the proposed action is located in the 100-year floodplain (500-year floodplain for critical actions) and/or within a designated wetland.

The project area is located within a special flood hazard area (Zone VE) subject to inundation by the 1-percent annual chance flood event, as shown on the FEMA Flood Insurance Rate Map (FIRM) panel 25007C0108J, dated July 20, 2016. Zone VE flood areas are coastal zone flood areas that are also subject to wave action. No wetlands are present or adjacent to the project area.

STEP 2 Notify the public at the earliest possible time of the intent to carry out an action in a floodplain and involve the affected and interested public in the decision-making process.

An initial public notice was posted on the Oak Bluffs Town website at https://www.oakbluffsma.gov/ on April 30, 2021.

STEP 3 Identify and evaluate practicable alternatives to locating the proposed action in a floodplain (including alternatives sites, actions, and the "No action" option). If a practicable alternative exists outside the floodplain, FEMA must locate the action at the alternative site.

No Action Alternative – Under the No Action Alternative, the existing revetment would not be restabilized and drainage culverts would not be replaced. The bluff would continue to erode following major storms and future sea level rise, and wave action would continue to overtop the bluff. Erosion would continue to undercut East Chop Drive and would likely make it unsafe to reopen. Flooding and

erosion from wave action would pose risks to aboveground utilities and nearby homes as bluff loss from erosion continued landward. The No Action Alternative does not meet the purpose and need of the project and, therefore, is not a practicable alternative.

Proposed Alternative – The Proposed Action includes the rehabilitation and expansion of the existing stone revetment seaward to accommodate a 100-year flood event and 2 feet of future sea level rise, ensuring the long-term stability of the bank and protection of landward public infrastructure and homes. This alternative minimizes the seaward discharge of stone armoring to the extent practicable to stabilize the bank and achieve the project purpose while maintaining the functions provided by the bank, including sediment/shoreline processes that furnish sediment to downdrift resources. It is not anticipated to disrupt the natural sediment transport, which reduces impacts to the aquatic environment. Under this alternative, functions and services of waters of the U.S. would be compensated for with in-lieu fee mitigation.

Alternatives within the floodplain – Two alternatives were analyzed within the floodplain. The first alternative includes retaining the existing revetment slope without seaward expansion. However, this alternative would result in expanded landward armoring and would completely armor the vegetated coastal bank. In this alternative, it is possible that wave action and future sea level rise may undercut/scour the existing seaward footprint, thus resulting in conditions similar to the existing situation and posing risk to nearby utilities, infrastructure, and homes. The armoring of the entire bank may also disrupt sediment functions. Hence, this alternative fails to meet the purpose and need of the project. The second alternative within the floodplain includes the installation of steel sheet piles and/or concrete walls and the removal of the stone revetment without seaward expansion. This alternative is practicable; however, without seaward expansion, storms and wave action may undercut/scour the sheet piles that would destabilize the bank, add to future erosion and unmitigated impacts to Waters of the U.S., and result in a similar condition to the existing state. Thus, this alternative does not meet the purpose and need of the project. This alternative may also result in the degradation of marine habitat as the existing stone revetment provides habitat niches.

Practicable alternatives outside the floodplain – There are no practicable alternatives outside the floodplain. The purpose of the project is to reduce erosion hazards on properties, adjacent utilities, and infrastructure, including East Chop Drive. It is not practicable to move the nearby residents, utilities, and infrastructure to a location beyond the potential erosion zone. Drainage outfalls are functionally dependent upon being within the floodplain, as it is the low point that the outfalls drain to. Without restabilizing the bluff within the flood zone, erosion would likely continue to occur, impacting properties, utilities, roads, and infrastructure further inland over time.

STEP 4 Identify the potential direct and indirect impacts associated with the occupancy or modification of floodplains and/or wetlands and the potential direct and indirect support of floodplain and/or wetland development that could result from the proposed action. 44 CFR Part 9.10.

The Proposed Action would result in the following short-term adverse impacts on floodplains:

- Construction activities would include the discharge of 6,005 cubic yards of riprap over 15,180 square feet below the high tide line. This discharge would impact the ability of the project area to provide existing services and functions of marine habitat.
- Construction activities could result in an accidental release of hazardous waste during the construction period.
- Construction activities would generate noise in the project area, potentially resulting in temporary impacts on fish and wildlife species that use the floodplain and surrounding area as habitat.

- Construction activities have the potential to spread invasive plant species (1) by creating disturbed areas that allow invasive plants to spread and (2) from stowaway species that come in on equipment and vehicles.
- If construction occurs inside the nesting season, there could be a short-term adverse effect on migratory birds that use the floodplain.

In the long term, the Proposed Action may result in the permanent loss of Essential Fish Habitat and would discharge approximately 15,180 square feet of fill into the floodplain. These impacts would be compensated for in the form of in-lieu fees in the amount of $49,197.

STEP 5 Minimize the potential adverse impacts and support to/within floodplains to be identified under Step 4, restore and preserve the natural and beneficial values served by floodplains.

The Proposed Action is functionally dependent upon its location in the floodplain (44 CFR 9.11(d)(1)(i)) and, being the only practicable alternative, potential impacts will be minimized (44 CFR 9.11(d)(5)). FEMA will require the following conditions, in addition to the in-lieu fee described in Step 4, to avoid and minimize the potential adverse impacts identified in Step 4:

In accordance with 44 CFR 9.11:

- The Subapplicant must obtain any necessary local floodplain permits for the Proposed Action in accordance with 44 CFR 9.11(d)(6).
- The Town shall follow all conditions and recommendations in accordance with NOAA and National Marine Fishery Services letter dated September 5, 2019:
    - Compensatory mitigation should be assessed for the loss of sand, gravel, and cobble intertidal beach habitat impacted by the proposed rock revetment expansion.
    - An operation plan shall be developed by the Town to ensure silt curtains, or other on-site structures placed to minimize sedimentation and turbidity, will be secured and prevented from causing debris to enter nearshore waters.
- The Town shall follow all conditions identified in the MA DEP Permit #15069, dated October 23, 2019.
- Compensatory mitigation shall be paid in accordance with USACE permit number NAE-2017-01616, dated January 14, 2020.

The Proposed Action would restore the existing revetment and be extended seaward to protect the bluff, based on 100-year flood levels and future sea level rise. Failing drainage culverts would be replaced and the slope of the bluff would be reduced (to be more stable) and replanted with native vegetation. The Proposed Action would reduce erosion and overtopping of adjacent infrastructure, thus minimizing the risk of sediment from entering the floodplain and Waters of the United States. No increase in base flood elevations would occur.

STEP 6 Reevaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards or impacts on wetlands, the extent to which it will aggravate the hazards to others, and its potential to disrupt floodplain and wetland resources and second, if alternatives preliminarily rejected at Step 3 are practicable in light of the information gained in Steps 4 and 5. FEMA shall not act in a floodplain unless it is the only practicable location.

The Proposed Action remains practicable because the in-lieu fee described in Step 4 and minimization measures described in Step 5 effectively address adverse impacts on the floodplain. The alternatives eliminated in Step 3 remain impracticable because they do not meet the purpose and need of the project. The purpose and need of the project is functionally dependent upon being located within the floodplain. The Proposed Action will preserve many of the natural floodplain functions and protect adjacent infrastructure and property.

STEP 7 Prepare and provide the public with a finding and public explanation of any final decision that the floodplain is the only practicable alternative.

The final public notice will be included as part of the public notice of availability for the draft supplemental environmental assessment.

STEP 8 Review the implementation and post-implementation phases of the proposed action to ensure that the requirements stated in 44 CFR 9.11 are fully implemented.

The FEMA project grant will be conditioned for the subapplicant to secure federal, state, and local permits for work in the floodplain. Compliance with all federal, state, and local permits will be determined as part of the grant closeout process. Full details of the conditions placed on the grant can be found in the Record of Environmental Consideration.