

**Neeld Estate Shoreline Design Project Proposal
for
DNR Chesapeake & Coastal (Outcome 3) Grant**

Step 1: Common Application

1) Proposal Abstract (Please limit to 5 sentences detailing to the overall goals and methods of the proposed project(s).)

The objective of this design project is to plan a solution to restore and maintain a protective and stable shore system using a combination of: 1) four headland breakwaters; 2) sand nourishment; 3) dune grass plantings; and 4) potentially, beneficial use dredge material from the adjacent Breezy Point Marina channel. The site of the project is the shoreline of Neeld Estates, a single-family home community near Plum Point in Calvert County. The project will be performed by a contractor, Coastline Design, P.C., whose final deliverables will include plans, specifications, detailed implementation cost estimate, permits and a construction bid package. The project will be managed proactively by the Neeld Estates Citizens Association (NECA) Shoreline Committee, which was established in October 2020 to seek a solution to the worsening shoreline erosion problem via advice from representatives of state and local government organizations and qualified contractors leading to submission of grant applications. The foundation of our proposal is a proposal prepared for the Shoreline Committee by a highly qualified contractor with directly relevant design experience, specifically creation of plans for projects on the Chesapeake Bay and rivers in Maryland and Virginia.

2) Project Need or Problem (Identify the problem to be addressed. Will the project complement efforts to address stormwater, water quality, coastal hazards, flood mitigation, habitat restoration, etc. Is project in an identified hazardous area (i.e. Special Flood Hazard Area)?)

Neeld Estate, a residential community on the Chesapeake Bay composed of 117 homes, has been subject to significant community shoreline reductions due to the combination of severe storms and rising bay level. In 1993, the community had a 400 to 800-foot-wide beach that supported a wide range of individual homeowner and community activities/gatherings, including but not limited to the summer months. In 2010, ten waterfront homes at the northern end of the community were forced to install a bulkhead. Waves crash against the bulkheads creating wave reflection that has produced more shoreline erosion where the beach is not already protected. In 2020, the storms, rising bay level and bulkhead-influenced erosion necessitated placement of permanent one-ton sandbags at five homes south of the bulkhead. In just over the past year, bay front homes have lost 9-to-12 additional feet of property for this combination of factors. We anticipate that these hardened techniques (i.e., bulkheads and sandbags) will contribute to erosion continuing to travel from north to south along the community shoreline. Sadly, what once was a thriving shoreline and source of tremendous joy and pride for residents of all ages across the community is now a constant stressful reminder of the need for NECA to act with thoughtful urgency to mitigate the risk of future erosion, flooding and related property damage. See Attachment 1A in the "Other Attachments" section for pictures of the impact of the last three events, including the powerful October 2021 storm surge (largest since Hurricane Isabel), that damaged the community's shoreline (and homes) and become the latest call to action for our community!

3) Project Goals & Outcomes

The primary goal of this project is to develop a robust design and acquire the construction permits to restore and protect the Neeld Estate community shoreline. This design will protect infrastructure, specifically as roads and utilities (well and septic), as well as 117 homes in this close-knit community from wave action and repetitive flooding during storms and address resiliency issues due to sea-level rise.

The secondary goal is to use the draft and final deliverables to educate the community on the specifics of the solution (i.e., why, what and how) and, in doing so, maximize support for the implementation phase and participation in monitoring and potential maintenance activities post-implementation. These educational activities will provide access to more than just the local residents but could be expanded to the larger community.

The primary desired outcome is an executable design that facilitates NECA development of a compelling and affordable Outcome 3 construction proposal that translates to a long-term solution to our shoreline problem, one that mitigates the risk of future erosion, flooding and related property damage.

The secondary desired outcome is an educated community of advocates who understand the issues related to repetitive flooding and sea-level rise and can bring them to the larger community.

4) Project Context (Describe if the project will implement a recommendation outlined in a Watershed Implementation Plan, state or local vulnerability assessment, hazard mitigation plan, comprehensive plan, or other planning document. Include any 2014 Bay Agreement goals met)

Our project will support objectives outlined in the "Breezy Point/Neeld Estate Flood Mitigation Plan" published December 2016 by Calvert County Department of Planning and Zoning. This plan identifies Neeld Estate as the fifth most flood prone community in the county. On 8 April 2017, Calvert County government representatives presented the plan details at a NECA meeting. The plan included a set of recommendations in response to eight ranked flooding concerns identified by residents. Two of the county's recommendations related to shoreline erosion and another to stormwater management. See Attachment 1B in the "Other Attachments" section for this presentation. It is unclear if/how these specific recommendations have been prioritized relative to county-wide needs. Regardless, the attached letters of support for our proposed project signed by our State Senator, our State House Delegate, the Calvert County Board of County Commissioners and a Calvert County Environmental Planning Regulator speak volumes about our community's significant shoreline problem and the need to act now.

5) Project Co-benefits (Describe other benefits to be attained through your project, such as community engagement, carbon sequestration, habitat enhancement, etc. Does the project support a low income or underserved community? Please explain.)

Many co-benefits and outcomes exist for this project, including: habitat enhancement, shoreline stabilization, and hazards mitigation for a section of shoreline that has a critical erosion issue impacting homes and roads. The design will consider the environmental elements (i.e. wind, water levels, fetch, etc.) impacting the site and will protect infrastructure from storms and rising sea levels. The shore stabilization strategy that will be used in this project is a living shoreline which offers multiple benefits including buffering floods, reducing erosion, storing carbon, attracting wildlife, and improving water

quality by reducing Total Maximum Daily Load (TMDL) nutrient and sediment impacts to Chesapeake Bay. The following paragraphs address the co-benefits in detail.

Habitat enhancement: Restoring the beach and nearshore along this shoreline will provide habitat for fish and wildlife and provide spawning areas for fish and other living marine life. Areas with natural coastal habitat, such as beaches, have higher populations of fish and other living organisms important for shorebirds. The nearby marsh in Plum Point Creek is home to an abundance of wildlife including many kinds of birds that fish near our shoreline. In addition, a large population of horseshoe crabs comes to our diminishing beach in May/June to lay eggs in the sand and fertilize them. A section of the eroding shore was protected with a rock revetment and now, no beach exists along this section of shoreline. By incorporating the revetment into the project design, habitat can be increased in its vicinity. Submerged aquatic vegetation (SAV) is very limited in our section of the Bay. Breakwaters have been shown to sustain SAV populations, particularly on high energy shorelines, by reducing the wave energy behind breakwaters. Our beach is located along the boundaries of The Plum Point Oyster Sanctuary so the breakwater structures themselves can become oyster reefs to increase the oyster population. Due to flooding and storm surge, saltwater inundation kills upland vegetation, and the flood prone areas in our neighborhood have difficulty growing vegetation where sand over-washes. Beaches also provide needed habitat for meiofauna, microscopic marine animals that live in the sediment. Meiofauna is an important trophic link in the food web by serving as food for higher trophic levels. In addition, these invertebrates facilitate biomineralization of organic matter and enhance nutrient regeneration.

Infrastructure Protection: The system will protect upland infrastructure and improve coastal community resiliency by buffering storm waves and reducing flooding. Creating a high, wide beach will prevent breaking waves along the shoreline which cause overwash and flooding of roads. Only one road exists in the neighborhood to enter and exit, so coming and going from our homes can be impossible when it floods. As many cars must be moved to higher ground, this creates issues if health and safety emergencies occur. The flooding is not just a problem for the waterfront homes, but it is a community problem. Many low-lying properties flood from shoreline overwash. In the north end of the community, the waterfront homes are higher than the properties behind them. Shoreline overwash flood waters become landlocked in these low areas with no way to return to the bay. This project also will prevent the spread of sewage contaminated water through the community when our neighborhood floods. Every homeowner has their own well and septic many of which have aging septic systems and drain fields. Depending on the age and type of septic system they have, water from floods can get into some of the older septic system, sometimes overflowing or requiring pumping. Additionally, some homeowners are unable to flush toilets during instances of yard flooding because the septic tank is full of flood water. Creating a stable beach will increase property values and thereby tax revenue. Homes in a beach community with no beach and that are increasingly vulnerable to storm damage and flooding will lose property value. Increasingly, Neeld Estates have been impacted by storms and floods due to climate impact and global sea level rise. Flooding is now a more common event than ever; it no longer takes a hurricane or a Nor'Easter to do major damage. The streets have flooded at least three times in the last six years. In October 2021, we had an unusually high tide along with a strong SE onshore wind, accompanied by 4-to-5 foot waves, all causing waves to crash onto the yards of beach front homes. Water poured into the streets, flooding homes and property which were low lying. With the waves came a large movement of sand which had to be replaced in some areas and removed from areas where there was an abundant accumulation. Another painstakingly major cleanup job for many of our neighbors.

Calvert County provided three dumpsters over a period of three weeks to allow homeowners to clean out their flooded properties. Attachment 1B in the "Other Attachments" section, the "Breezy Point/Neeld Estate Flood Mitigation Plan" presented to at a NECA meeting in April 2017, presents statistics regarding the number of roads and homes impacted by community flooding events and the extent of the damage/disruption. There is strong evidence that the road/home impact data compiled in the 2015-2016 timeframe of the study (see page 6 of Attachment 1B) pales in comparison to the impact that Neeld Estate residents have endured over the last few years. For the purpose of this proposal, members of the Shoreline Committee did a physical count of the structures that are flood-prone today (55, or 22% more than indicated on page 6 of Attachment 1B) and roads that are flood-prone today (8, or 60% more than shown on page 6 of Attachment 1B). The table below identifies the number of flood-prone structures by road. In total, about 600 linear feet of the noted public roads are flood-prone.

	Number of Flood-Prone Structures
Bay Blvd	18
Bay Pkwy	1
Beach Dr	18
Cedar Dr	2
Knoll Rd	2
Lookout Trail	3
Ridge Rd	6
Shore Dr	5

Attachment 1C depicts the current reality by highlighting the large area (i.e., inside the red line) of our community routinely impacted by flooding today. It should be noted that that the 55 structures translate to approximately 86 residents being impacted. These values represent 47% of the homes and residents in Neeld Estate!

Shoreline Resiliency: Properly designed and constructed breakwater systems have been shown to provide superior shore protection and will recreate habitat along the shoreline that has been eroded over the last 25 years. The living shoreline, with grasses and vegetation above and below water, will absorb and reduce wave energy and also help reduce landward impacts from rising water due to global sea rise. The gapped offshore structures allow for tidal exchange and access by fauna. These structures will outperform a hardened shoreline by designing/creating breakwaters and a living shoreline. Ten waterfront properties at the north end of our neighborhood have with bulkheads. Waves crash against the bulkheads creating wave reflection producing more shoreline erosion where the beach is not protected. Five more homes, south of the bulkhead, have placed sandbag protection. We anticipate that the erosion will continue to travel from north to south. Not including the cost of the breakwater construction, a living shoreline is more cost effective than a hardened shoreline. This is a long-term solution as the breakwaters are designed to last 50 years will only periodic maintenance.

Social benefits: Many social benefits will result from this project. It will educate our homeowners about how to protect the Bay and provide a demonstration area for the community to be active in planting and maintaining native wetland plants. It also will show the community the benefits of having a natural

shoreline as compared to a hardened shoreline. Recreational use of the community beach is high for both leisure activities, such as swimming, sunbathing, and dog walking, and holding community events. The benefits of living near the water has been shown to increase physical activity, lower psychological distress, and have better overall health and well-being. Creating safe access will maximize well-being benefits for residents particularly at a time when the coronavirus has increased stress as well as physical and mental health challenges. NECA is very active within the community and is committed to providing learning experiences. We created the Shoreline Committee to examine options to preserve and restore the shoreline of NECA. The committee has become a team of dedicated community members who have learned about solutions that will have the highest probability of obtaining our goal as naturally as we can with the use of breakwaters and a living shoreline. Although our focus to date has been to educate residents of Neeld Estates, we will think carefully about the best way to extend educational opportunities to individuals and groups outside our community. For instance, we can envision including outside groups (e.g., other communities, girl/boy scout troops, schools, etc.) to help with monitoring or planting grasses. In short, it's been a constant learning experience and we look forward to learning more as a community and sharing our knowledge and experience with interested parties outside Neeld Estate!

6) Partner Roles (Explain the roles and responsibilities of each project partner, including any sub-awardees).

The project will be performed by a contractor, Coastline Design, P.C., whose final deliverables will include plans, specifications, detailed implementation cost estimate, permits and a construction bid package. The project will be managed proactively by the Neeld Estates Citizens Association (NECA) Shoreline Committee, which was established in July 2020 to seek a solution to the worsening shoreline erosion problem via advice from representatives of state and local government organizations and qualified contractors leading to submission of grant applications.

Construction project leadership will be in the hands of a member of the NECA Shoreline Committee, who will be assisted by the same contractor who will develop the plan financed with the CBT grant. This contractor will be responsible for performing two major tasks – construction management (including bid package and weekly project inspection) and an as-built survey and report. Additionally, based on a July 2021 meeting with Jackie Takas, Watershed Restoration Specialist for University of Maryland Extension/Sea Grant Program, we envision a partnership with her as well.

7) Outreach (Describe any evaluation, education, or communication activities that will be completed to disseminate project outcomes. Please also describe the project or outcome transferability to other communities, agencies, etc. Estimate number of visitor/year.

NECA (www.neeldestate.com/) is very active within the community providing access to environmental information as well as creating community get-togethers that can be used for education about the project and habitat needs that will improve Chesapeake Bay. The shoreline issues have been discussed via email, Facebook, the NECA web site (www.neeldestate.com) and at every NECA community meeting since Oct 2020, when the Shoreline Committee was established.

Attachment ID in the "Other Attachments" section is the completed "Homeowners Association/Community Property Project Authorization" template. Our responses to the questions,

including Attachments 1D-1 and ID-2, clearly demonstrate that NECA's President and, most notably, NECA's Shoreline Committee have accomplished the outreach required to educate the community about all dimensions of our project (i.e., the why, what, how and who) and garner broad community support for the project. The education has enabled significant community knowledge, understanding and engagement that will benefit this project from inception through sustainment.

As noted in the social benefits section of co-benefits response, we will think carefully about the best way to extend educational opportunities to individuals and groups outside our community once we feel like our community has attained the level of knowledge and understanding required to successfully implement and sustain. At this time, we are not in a good position to estimate the number of potential visitors per year who will visit our private community for educational purposes.

8) Start date: 10/17/2022

9) Key Milestones:

Milestone 1: Site and geotechnical assessment, survey. Existing data will be utilized to determine the physical and hydrodynamic conditions at the site which will affect the design. The site survey will establish elevations needed for the project design (2 months from contract award).

Milestone 2: NECA Review of 30% Shoreline Plan (3 months after contract award). This review will afford the community the opportunity to state its goals for the project and have them addressed in the plan.

Milestone 3: NECA Review of 60% Shoreline Plan. NECA will review the design to ensure the final project will reflect their goals as well as provide shore protection for the community (4 months after contract award). This is the basis for the joint permit application.

Milestone 4: Submit Army Corp of Engineer, MDE, and Calvert County Joint Permit Applications (5 months after contract award). This task could take up to 9 months for approval of permits.

Milestone 5: NECA Review of Construction Bid Package (i.e. final plans, specifications and bid form): Work will occur concurrent to Milestone 4 and be finalized 1 month after receipt of state and federal permits.

10) End date: 2/16/2024

11) Project Sustainability After Grant Term (Detail how results will be applied to ongoing projects or used to inform future work. If applicable, specify continued financial and technical support. For design: have construction funds been identified? For construction: long-term care & protection?)

Living Shoreline breakwater projects have been installed around Chesapeake Bay in a variety of settings over the past 40 years. Since most of those systems have remained resilient to changing conditions, it is anticipated that this project will likewise be sustainable over the long term. Regardless, NECA's Shoreline Committee will perform continuous, proactive monitoring that will inform adaptive management of the project into the future. At this stage, it is difficult to predict additional financial or technical support that might be required. If/when support requirements materialize, the Committee

will leverage the 'right' technical and financing expertise to ensure project sustainability well beyond the grant term.

12) Success Metrics (Describe how you will measure project success and document progress and results. What are your criteria for success and what tools will you use to evaluate the project? Identify number of properties and critical infrastructure to benefit from project.)

Upon implementation, NECA will monitor several metrics including vegetation cover, and sand stability and retention annually and after storms. Some candidate metrics NECA may consider tracking address the following important questions: a) Has the shoreline position stayed in dynamic equilibrium?; b) Has sand elevation been maintained?; c) What is the percent vegetation cover?; d) Has the vegetated edge moved bayward since installation?; e) Are invasive species present?; and f) Has the shellfish community developed on the structures.

This project will be designed for the 100-year storm and a 1 foot sea-level rise by 2040. As such, monitoring will provide time-series information about how well the project is meeting goals. Monitoring also will provide the basis for adaptive management that enables effective issue resolution and achievement of stated project goals.

13) Community/Citizens Science Monitoring (CCS is working with select grantees to develop community/citizen science guidance to help monitor the project post-construction. While not required, describe your community's willingness and capacity to participate in monitoring).

NECA would be excited to participate in activities that this monitoring. Our Shoreline Committee is the logical NECA organization to assume responsibility and accountability. Since the level of engagement and interest in the solution we hope to implement is high, we have high confidence that members of the committee will commit the requisite time for the required monitoring activities.

The Shoreline Committee will work with the community/citizens to implement a monitoring plan that will determine success metrics. This will include photography and vegetative monitoring and replanting if necessary after storms.

Attachments

Transmittal Letter *

On official letterhead and signed by an executive who is authorized to request funding on behalf of the applicant organization

Select a file

Letters of Support

Please combine into one .pdf.

Select a file

Other Attachments

Please combine into one .pdf.

Select a file

Step 2: Project Details/Tasks

14) Practice-Specific Details (Describe the practice to be designed or implemented, the current land use, and how it was selected. For implementation, please include BMP size details.)

Plum Point is located along Chesapeake Bay in Calvert County, MD (see Attachment 2A Figure 1 in "Current Designs" section). Plum Point and adjacent shorelines have gone through significant shoreline change over the years with ongoing erosion at the proposed site. The Neeld Estate Citizens Association (NECA) shoreline extends from the south jetty (adjacent to the entrance inlet into Breezy Point marina) southward about 1,200 feet to approximately to the end of Bay Parkway. This project shoreline has evolved over the years from having a relatively wide beach 25 years ago to having either a narrow beach or no beach at all by 2020 resulting in extensive bulkheading and further beach width reduction.

The Neeld Estate shoreline represents the sole project location considered due to persistent shoreline erosion and movement of sand (littoral drift). This site has been impacted by coastal hazards with increasing frequency. Storms in 2015, 2018, 2020 and 2021 flooded the roads of the community. In addition, a tornado caused significant damage to homes on the Estate in 2020. See Attachment 2D in the "Pictures" section for photos of the impact of 2020-2021 storms.

The shoreline project will implement a combination of the following restoration and protection techniques (see Attachment 2A, Figure 2 in the "Current Designs" section for the concept sketch):

- headland breakwaters;
- sand nourishment;
- dune grass plantings; and
- potentially, dredge material from the adjacent Breezy Point Marina channel.

Relevant metrics regarding the site of the intended living shoreline follow:

Length to be designed: 1,200 ft (Note: The estimated cost to implement the design = (linear feet designed) x (\$1K to \$1.3K design cost per linear foot), or \$1.2M to \$1.56M.)

Bank Height: 5 ft

Erosion Rate (1960-2018): -1.2 ft/yr

Drainage area treated/planned: 50 acres

Impervious acre treated: 48 acres (Site length * 0.04; based on MDE (2020))

Sediment Reduced: 371,330 lbs/yr (Protocol 1 TSS=BankHeight*ErosionRate*ShoreLength* 93.6 (lbs/cf; bulk density) * 0.551 (Sand reduction factor in MD))

N Reduced: 108 lbs/yr ((Protocol 1 TSS) * 0.00029 (lbs TN / lbs TSS))

P Reduced: 76 lbs/yr ((Protocol 1 TSS) * 0.000205 (lbs TP / lbs TSS))

Headland breakwater systems have been shown to provide long term shore protection using stable pocket beach technology. Many of these systems have been installed over the years, many over 30 and some over 40 years old giving testament to long-term durability (see Virginia Institute of Marine Science,

Shoreline Studies Program, Breakwater Database 2020, https://www.vims.edu/research/departments/physical/programs/ssp/shoreline_management/breakwaters/index.php). They not only provide a strong sustainable beach system that withstands severe storm events but also provide beach and dune habitat. These Bay coast habitats have been significantly reduced over time due to shoreline hardening and channel dredging. A stable dune requires a stable beach. Estuarine beaches/dune systems serve as habitat for a wide variety of plants. Dune vegetation is characterized by its ability to withstand extremes in the natural environment. Vigorous vegetation both on the dune crest and leeward side of the dune can stabilize the sand substrate and provide attractive habitats for some shore-dwelling animals. This includes various bird which utilize the area for roosts and nesting. Dunes also support a wide variety of small mammals and reptiles (see VMRC 1993 in reference list at the close of this section).

We based our selection decision on lessons-learned, data, etc. from other similar restoration projects. Over the years, it has been found that breakwater length should be 2 to 2.5 times the design wave length and that the use of coarser sand for nourishment should be used. Wider gaps between breakwater units are more appropriate for a unidirectional wind wave climate whereas smaller gaps maybe needed in a more bimodal or omni-direction wind wave climate where beach sands can shift from one side of the embayment to the other. See Attachment 2B-1 in the "Supporting Technical Documents" section for a related journal article co-authored by two members of Coastal Design, P.C. (i.e., the contractor that will perform the design phase work) and Attachment 2B-2 in the "Supporting Technical Documents" section for a related presentation given by Scott Hardaway on behalf of the Virginia Institute of Marine Science.

Other techniques (e.g., bulkheads, rip rap and sandbags) were considered, but each of these shoreline hardening measures do not provide habitat or recreation benefits that the breakwater living shoreline project will. Other techniques will not provide long-term shore protection or coastal resiliency. They also prevent beach sands, even with beach nourishment alone, from residing alongshore for long especially during storm events primarily dune-to- wave reflection off the structures.

=====

Relevant References

- Hardaway, C.S. and Gunn, J.R., 1991. "Headland Breakwaters in the Chesapeake Bay." Civil Engineering, October 1991, ASCE, 64-66.
- U.S. Army Corps of Engineers, 2014. Procedures to Evaluate Sea Level Change: Impacts, Responses and Adaptation. Technical Letter No. 1100-2-1. Department of the Army, U.S. Army Corps of Engineers, Washington DC. 2-314-1000
- VMRC, 1993. Coastal Primary Sand Dunes/Beaches Guidelines. Virginia Marine Resource Commission 2600 Washington Ave, Newport News, VA 23607. Developed pursuant to Chapter 14 of Title 28.2, Code of Virginia

15) Climate-related Impacts (Explain how the practice will address a climate-related impact.)

Neeld Estate (38.613451°, -76.512155°) is a community of 117 homes that is increasingly susceptible to coastal hazards including storms, flooding, and sea-level rise. Because the entire community is part of the Chesapeake Bay Critical Area, the Citizen's Association is proactive in working with homeowners to understand that all projects can impact the health of the bay. The tide range at Plum Point is 1.4 feet. According to FEMA (2014), the storm surge levels for the 10, 50, and 100-year storms are 4.1, 4.5, and 4.7 feet (respectively) above mean low water (MLW). For planning purposes, we will use the 100-year water level. Also, according to MD DNR, a 1.3-foot rise in sea level by 2050 can be expected. This is best addressed through an adaptive management protocol as developed by the USACE 2014 where the addition of rock and/or sand to raise the crest elevation of the structure maybe required after 20 to 25 years due to sea-level rise.

16) Supporting Information (Provide a summary of any site analyses, concept design(s), or technical/expert advice relevant to the project.)

The project will be performed by a contractor, Coastline Design, P.C., whose final deliverables will include plans, specifications, detailed implementation cost estimate, permits and a construction bid package. Coastline Design, P.C.'s President, Scott Hardaway, will lead and be actively involved in this effort. NECA has selected Coastline Design, P.C. by virtue of not only the firm's (in particular, Mr. Hardaway's) technical expertise and relevant project experience, but also the NECA Shoreline Committee's ongoing productive/educational dialog with Mr. Hardaway. In short, we've established a trusting relationship with Mr. Hardaway that give us confidence that Coastline Design, P.C. is the the right partner to deliver the right products to maximize the probability that the results of the design phase grant will set the stage for eventual implementation success. See attachment 2B-3 in the "Supporting Technical Documents" section for information about Coastal Design, P.C. qualifications, including a one page resume-like document and presentation detailing project performance relevant to NECA's effort.

Coastline Design, P.C. will perform the following four major tasks:

Task 1: Site Survey and site assessment

- Conduct a site assessment using existing online data
 - o Site assessment includes physical and hydrodynamic settings that affect the shoreline now and into the future. This assessment also includes the proximity of marine resources to the site.
- Conduct an elevation survey in Maryland State Plane horizontal coordinate system with vertical control adjusted to mean low water (MLW).
- Assess nearshore stability with a combination of short cores, augers and probes

Task 2: Preliminary plan

- Prepare preliminary shoreline plan with CAD site drawings
- Conduct special NECA meeting for NECA Shoreline Committee to present plan, respond to questions and solicit feedback from community members, including but not limited to NECA Officers.

Task 3: Pre-final Plans and Associated Products

- Conduct a pre-permit application site visit with Maryland Department of Environment (MDE) and U.S. Army Corps of Engineers.
- Evaluate site visit findings (e.g., risks) and associated design recommendations

- Prepare Joint Permit application (JPA) for submission, including the following state and federal permits
 - o Maryland Department of Environment (MDE): Water Quality Certification
 - o Maryland Board of Public Works (BPW): Wetlands License
 - o U.S. Army Corps of Engineers (Corps): Department of the Army Permit

Task 4: Final Plans and Associated Products

- Prepare final plans
- Prepare final specifications
- Prepare construction cost estimates
- Acquire local permits, including Critical Areas and Erosion And Sediment Control
 - o Calvert County SCD Erosion and Sediment Control Permit
 - o Calvert County Critical Areas permit
 - o Calvert County Building permit, if needed.

See Attachment 2B-4 in the "Supporting Technical Documents" section for Coastal Design, P.C.'s proposal with scope of work, cost estimate, schedule and supporting figures. Note that Figure 10 in this attachment is the same concept sketch provided separately in Attachment 1A for ease of proposal evaluator reference.

17) Start date: 10/17/2022

18) End date: 2/16/2024

Attachments

Current Site Designs

Select a file

Supporting Technical Documents

Site design(s) are required for construction proposals.

Select a file

Landowner Agreement

Select a file

Photos *

Select a file

Last saved on 12/15/2021 at 8:30:10 PM

Step 3: Budget Spreadsheet

Note: This spreadsheet is not shown here because it includes contractor sensitive rate information.