



# **Kettle Cove Road Watercraft Launch Preliminary Design Report**

For

## **Kettle Cove Road Watercraft Launch Improvements Kettle Cove Road Cape Elizabeth, ME**

Prepared For:  
Town of Cape Elizabeth  
320 Ocean House Road  
Cape Elizabeth, Maine 04107

Prepared By:  
Sebago Technics, Inc.  
75 John Robert Road, Suite 4A  
South Portland, Maine 04106

September 2020  
19062

# Table of Contents

1.0 Executive Summary .....	3
3.0 Project Understanding.....	4
4.0 Resource Investigation .....	6
5.0 Proposed Watercraft Launch Preliminary Design .....	7
6.0 ME Dept. of Agriculture, Conservation, & Forestry’s Bureau of Parks and Lands Comments..	8
7.0 Permitting Considerations .....	8
7.1 Local Level Permitting:.....	8
7.2 State Level Permitting:.....	9
7.3 Federal Level Permitting:.....	9
7.4 Other Agency Considerations .....	9
8.0 Estimated Costs of Construction .....	10
9.0 Conclusions .....	10

## Appendix:

Appendix A – Exhibits

Appendix B – Project Area Photographs

Appendix C – Wetland Memorandum & Geotechnical Report

Appendix D – Email Correspondence & Town/State Park Department Meeting Summary

Appendix E – Construction Cost Estimate

Appendix F – Existing Conditions Plan & Preliminary Site and Grading Plan

## **1.0 Executive Summary**

In support of a Shore and Harbor Planning grant received from the Maine Coastal Program, the Town of Cape Elizabeth retained the services of Sebago Technics to survey, delineate natural resources, develop a preliminary design, and assess the potential permitting ramifications and construction cost implications associated with the proposed Kettle Cove Road Watercraft Launch improvements to be located off Kettle Cove Road. The Town has also hired the firm of S.W. Cole Engineering, Inc. to conduct a subsurface geotechnical assessment of the project area in order to provide an assessment of the suitability of the existing soil conditions to support a watercraft launch and to provide recommendations to overcome any subsurface soil limitations.

Sebago Technics has collaborated with the Town Staff and regulatory agencies in the assessment of the proposed watercraft launch. In addition, Town Manager Matthew Sturgis met with State of Maine Park representatives to review operational considerations and the necessary steps to be taken so that the Town can receive an easement from the State of Maine to construct, operate, and maintain a watercraft launch within the Crescent Beach State Park property.

From this process, Sebago Technics created a Watercraft Launch Preliminary Site and Grading Plan which will be used as a basis for future final design, permitting, and funding considerations. This preliminary plan includes the installation of a crushed stone surfaced gravel access drive approach and turnaround that connects to a concrete plank ramp which will provide access to the beach area. Based on the position of the State of Maine Park Division and the preferences of the Maine Department of Environmental Protection (DEP), the previously desired repurposing of the existing gravel watercraft launch area into a pedestrian-only beach access has been eliminated from consideration and instead the existing ramp area will be restored to a natural condition.

As currently proposed, no local permitting for the project will be required from the Cape Elizabeth Planning Board or the U.S. Army Corps of Engineers. A Natural Resource Protection Act (NRPA) Permit-by-Rule approval will be required from the Maine DEP in order to construct the new launch facility.

Applying a 25-percent contingency, Sebago Technics estimates a \$67,660 construction cost to build the new Watercraft Launch facility and a \$17,660 cost to restore the existing launch for a total estimated project cost of \$85,320.

This report confirms the readily achievable feasibility for the Town to relocate Kettle Cove Watercraft launch project which now will include the restoration of the existing ramp. At this time, the Town and Sebago have not solicited public feedback as part of this preliminary plan development process. It is anticipated that a presentation of this report's findings to the Town Council and the receipt of public input would be the next steps in the project progress.

## **2.0 Introduction**

Sebago Technics, Inc. (Sebago) has been retained by the Town of Cape Elizabeth (Town) to provide services related to survey, natural resource mapping, planning and preliminary design, along with the assessment of potential permitting ramifications and construction cost implications associated with the proposed Kettle Cove Road Watercraft Launch improvements for the purposes of determining the feasibility of creating a new watercraft launch and exploring the repurposing of the existing launch into a pedestrian-only access to the beach areas. Sebago has communicated with both State and Federal regulatory agencies as well as the Town staff that would have input into the planning, design, and permitting process.

The Town has also hired the firm of S.W. Cole Engineering, Inc. (SW Cole) to conduct a subsurface geotechnical assessment of the project area in order to provide an assessment of the suitability of the existing soil conditions to support a watercraft launch area and to provide recommendations to overcome any limitations. The results of this subsurface study have then been integrated into the preliminary design plan. At this time, the Town and Sebago have not solicited public feedback as part of this preliminary plan development process. It is anticipated that a presentation of the report findings to the Town Council and the receipt of public input would be the next steps in the project progress.

A USGS Quadrangle based Location Map showing the location of the proposed watercraft launch project area within Cape Elizabeth is included within Appendix A of this report. The location of the new launch area is indicated in more detail on Exhibit 1 which is also in Appendix A of this report. Exhibit 1 also includes locations of other relevant nearby features. We have also included several photographs of the project area in Appendix B of this report.

The following discussion provides an assessment of the conditions associated with the proposed watercraft launch project based on the preliminary plan development.

## **3.0 Project Understanding**

As taken and quoted directly at times from the April 2018 Cape Elizabeth Harbors Committee Report, this section of this report reviews the background and the need behind the current preliminary design stage of the proposed watercraft launch area to be located off Kettle Cove Road. The Kettle Cove/Crescent Beach area is the one coastline area within the Town of Cape Elizabeth that currently needs new solutions as it represents an ongoing challenge of varying commercial and recreational uses, State and local jurisdictional boundaries and responsibilities, and often conflicting neighborhood interests. These challenges are compounded by the natural conditions and physical space limitations of the area as well as its overall and growing popularity among its users, particularly during the summer months.

Watercraft access for the public to the Kettle Cove/Crescent Beach area is limited by the constraints related to the current launch area. This public access is currently located along a narrow gap between two portions of the Crescent Beach landholdings by the State of Maine. It is located to the north of the State's Kettle Cove Parking Lot and is accessed by a gap in the boulders which line the west side of Kettle Cove Road. The relatively steep public use ramp is maintained by the Town and often requires the replacement of gravel caused by the loss of material to wave action due to the ramp's open exposure to the ocean. The launch's proximity to residences across Kettle Cove Road also often creates conflicts with the neighborhood residents when users prolong the unloading of equipment and the launching of recreational watercrafts, or use the launch area inappropriately.

In addition, an open drainage course which crosses the beach area to the northwest of the launch site often temporarily erodes a channel which cannot be passed over by most recreational vehicles. This situation creates a very restricted area near the launch site for users, and prevents the access to the much wider and protected sections of Crescent Beach to the northwest.

The Cape Elizabeth Fishermen's Alliance (CEFA) and residents of the Town have proposed a relocation of the existing Town public beach access to a historical watercraft launching area further to the northwest. The new facility would be accessed off Kettle Cove Road and located within the State-owned Crescent Beach State Park. Both the Cape Elizabeth Harbors Committee and the Town Council were supportive of this initiative. The use of the historical watercraft launch was curtailed many years ago due to improper activities. Access to this area is currently restricted by a series of large boulders placed by the State of Maine along the west side of Kettle Cove Road.

As part of the Harbors Committee review process of the Cape Elizabeth shoreline issues, the Cape Elizabeth Town Council included in its charges to the Harbors Committee that the Harbors Committee *"Meet with State officials to determine options for boat access in the Kettle Cove/Crescent Beach State Park area and develop a long-range plan for access"*. The Harbors Committee met with State of Maine officials to discuss the possibility of relocating the recreational watercraft launch to a past historically used launch area. During these meetings, representatives from the State of Maine Department of Agriculture, Conservation, and Forestry's Bureau of Parks and Lands indicated to the Harbors Committee that the State would very much support the effort to move the public vehicle beach access.

The representatives did note, however, that any improvements to create this new watercraft launch area would need to be funded by the Town as the State has no budget within which to financially support the development of a new watercraft launch site. Further, the improvements would need to be engineered and properly permitted. In order to do so, a comprehensive agreement between the State and the Town would need to be agreed upon that stipulates each parties' responsibilities. That agreement would eventually require an easement which would allow the Town to construct, operate, and maintain the improvements the watercraft launch within the property limits of Crescent Beach State Park.

The Harbors Committee report also recommended that the existing watercraft launch be repurposed as a pedestrian-only access point to Crescent Beach and vehicular use of the current launch be prohibited.

The report concluded that clear separation of uses and proper signage stipulating these uses would resolve much of the conflict within the Kettle Cove/Crescent Beach area. By providing an improved public beach access and launching capabilities, the public users would be more inclined to use the more accessible public area and less apt to use the more restrictive Watercraft Cove launch area with Kettle Cove State Park which should be limited to users and the Town's WETeam. In addition, the ongoing accessibility conflict represented by the existing drainage channel that crosses the beach to the northeast of the existing watercraft launch area would be eliminated by moving the public watercraft launch area to the north of drainage channel and thereby providing unencumbered access to Crescent Beach.

The Harbors Committee report included four recommendations. Since the report was published, the Town was successful in the receipt of a Shore and Harbor Planning grant from the Maine Coastal

Program to conduct this planning study and develop a preliminary plan to allow the Town to work toward addressing these recommendations so that the stated objectives can be met.

1. Enter into an agreement with the Operations and Maintenance Division of the Maine Department of Agriculture, Conservation, and Forestry's Bureau of Parks and Lands stipulating each parties' understandings and responsibilities associated with the relocation of the public vehicle beach access to the historical watercraft launch area to the northwest off Kettle Cove Road.
2. Follow-up with steps to secure an easement from the State of Maine that would allow the Town to construct and maintain the improvements and then operate the new public vehicle beach access site.
3. Investigate and seek grant opportunities that could be used to assist in the funding of the new public access location.
4. Design, permit, construct, maintain, and operate the new public vehicle beach access area while repurposing the existing beach access area to provide safe pedestrian-only access to Crescent Beach.

This report outlines the findings of the planning study and preliminary plan development for the proposed watercraft launch.

#### **4.0 Resource Investigation**

In order to assess the resources which would need to be considered in the relocation of the watercraft launch, and to evaluate the permitting required to be able to construct the project, Sebago Technics surveyed the existing conditions of the project area and then investigated the limits of the isolated wetland boundaries within the vegetated areas of Crescent Beach State Park. The results of the field survey and wetland delineation are depicted on the September 23, 2020 Existing Conditions Plan of the project area as prepared by Sebago which is included in Appendix F of this report.

The wetland delineation was performed in December of 2019 by Michael Jakubowski and Gary Fullerton of Sebago Technics and was conducted in general accordance with the 1987 Wetlands Delineation Manual and Regional Supplement authored and published by the U.S. Army Corps of Engineers (USACE). A December 13, 2019 memorandum of wetland field investigation findings is included in Appendix C of this report.

Our field delineation identified two isolated wetland areas and no vernal pools. One of these wetlands, Wetland B, is identified as being a Resource Protection-1 (RP-1) Wetland which is located north from the proposed Watercraft launch. RP-1 is defined as a critical wetland district in Chapter 19 of the Town's Zoning Ordinance. These areas deserve the highest protection from filling, draining, and other adverse activities due to their environmental importance. Per the Ordinance, a one-hundred-foot buffer will be applied in this location because this proposed project area is distinctly separated from the RP-1 wetland and none of the project area runoff would be directed toward the RP-1 wetland. As part of Wetland B, RP-2 wetland areas surround the RP-1 portion of the wetland. The RP-2 category of wetlands has no local Ordinance required setback criteria.

The location of the proposed launch will be restricted to be placed further to the north by limits of the RP-1 setback as the watercraft launch use is not a permitted use within the RP-1 wetland and its required setback area. Further, the presence of Wetland A, which is an RP-2 wetland found between existing and proposed watercraft launch and serves as the manmade outlet for the manmade drainage system of Kettle Cove Road, limits the location to the south of the new watercraft launch.

## **5.0 Proposed Watercraft Launch Preliminary Design**

For the purposes of our preliminary design evaluation, Sebago initially analyzed several options with the Town Staff for the potential public watercraft launch and pedestrian access. From this discussion, we then formalized two of these options for Town Staff and regulatory agency preliminary review.

Alternative 1 consisted of approximately 2,340 square feet of crushed stone surfaced gravel area and 480 square feet of concrete planks for the watercraft launch area connection to Kettle Cove Road.

Alternative 2 was similar to Alternative 1, but contained a turnaround area that would make it more efficient for watercraft loading and unloading as well as aid in the backing of vehicles onto the concrete planks leading to the beach. This alternative consisted of approximately 3,035 square feet of a larger crushed stone surfaced gravel area with the same 480 square feet area of concrete planks.

Alternative 2 was then selected as the basis for the Preliminary Plan layout from the review comments that were received from the Town Staff, regulatory agencies, and the State of Maine Department of Agriculture, Conservation, and Forestry's Bureau of Parks and Lands. The addition of the turnaround does not appear to complicate the permitting of the project nor add a significant cost to the overall construction of the project. The turnaround option was also deemed a superior layout for users of the facility. A copy of the September 21, 2020 Preliminary Site and Grading Plan depicting the proposed layout of the proposed watercraft launch is included with this report.

Clearing of vegetation and grubbing of the existing surface materials will be necessary to construct the new launch, however, no significant trees will be removed as part of this project. The subsurface geotechnical investigation as conducted by S.W. Cole Engineering and the Cape Elizabeth Public Works Department revealed that up to approximately 3.5 feet of fill and organic material were encountered in the test pits excavated at the site. Therefore, the soils found at the project site are unsuitable to support the new watercraft launch and must be removed and replaced with compacted gravel borrow. Also as recommended in S.W. Cole's geotechnical report, the over-excavation of the unsuitable material should extend 1-foot laterally outward from the edge of gravel section for every 1-foot of vertical depth.

This report also recommends a gravel buildup for the approach to the ramp be surfaced with 3-inches of Crushed Stone overlying 12-inch layer of compacted Base Gravel material. Further, the report recommends pre-cast concrete planks should be used on the slope of the launch to protect against erosion and armor the ramp against wave action. The preliminary design plan includes these recommendations as well as added rip rap armor to supplement the edges of the concrete plank and provide additional erosion and wave action protection. S.W. Cole Engineering's January 29, 2020 geotechnical report on the project site is included in Appendix C section of this report.

The new launch approach is proposed with a slope of 4-percent off Kettle Cove Road which then transitions into 6-percent grade before finally transitioning into a steeper 12-percent slope on the

concrete planks. The concrete planks then end above the location of the Highest Annual Tide (HAT) elevation.

Within the original alternatives, a proposed pedestrian access was designed to repurpose the existing watercraft launch area. Sebago proposed the use of pre-cast concrete mats which provide protection against erosion. Concrete mats typically have soil or gravel between the blocks and are therefore less “developed” or intrusive to a natural shoreline that poured concrete. Review comments from both the Maine Department of Environmental Protection (DEP) regulatory agency staff and representatives of the State of Maine Department of Agriculture, Conservation, and Forestry’s Bureau of Parks and Lands indicated their preference to restore the existing ramp to a natural state rather than to create a pedestrian access location. Based on these comments and our discussions with Town Staff, it was determined to remove the pedestrian access provisions and indicate that this existing launch area would be restored to natural conditions.

## **6.0 ME Dept. of Agriculture, Conservation, & Forestry’s Bureau of Parks and Lands Comments**

As the new watercraft launch would be located on land which is part of the Crescent Beach State Park, the Town will need to receive an easement from the State of Maine to allow construction, operation, and maintenance of the watercraft launch. To further that discussion and detail upcoming steps, Town Manager Matthew Sturgis met on May 14, 2020 with State Park Regional Manager, Gary Best, and Kurt Shoener who manages Crescent Beach, Kettle Cove, and Two Lights State Parks in Cape Elizabeth.

During that meeting, the State reiterated their support of the proposed project and outlined their stipulations for granting the easement and allowing the new watercraft launch project to go forward. Among their key points were the elimination of the existing watercraft launch from consideration as a pedestrian-only access to the beach and the measures to be considered to physically restrain pedestrians from using that area to access the beach. They also noted several administrative changes to the watercraft launch permit process and their preference to include a turnaround in the watercraft launch design. The State representatives also reviewed with you the easement process and possible funding opportunities for the watercraft launch. A copy of email correspondence between Matt Sturgis and Gary Best as well as a May 14, 2020 meeting notes as prepared by Gary Best is included within Appendix D of this report.

## **7.0 Permitting Considerations**

In order to assess if the project may require local, state, and federal permits be received respectively from the Town of Cape Elizabeth Planning Board, the Maine Department of Environmental Protection (DEP), and the U.S. Army Corps of Engineer (USACE), Sebago contacted each regulatory body with a description of the project parameters and natural resource characteristics of the site and requested an opinion as to the level of permitting, if any, that would be required.

### **7.1 Local Level Permitting:**

The wetlands delineated at Crescent Beach are RP-1 and RP-2 wetlands. Since the RP-1 wetland to the north is distinctively separated from the proposed launch improvements, a 100-foot setback will need to be maintained. According to the Town of Cape Elizabeth Code Enforcement Officer, Benjamin McDougal, the local permitting needs will consist of a Resource Protection permit from the Cape Elizabeth Planning Board should any wetlands be directly impacted. A copy of a March 9, 2020 email from Ben McDougal in which he concurs with the 100-foot RP-1 setback is included within Appendix D of this report.



We later contacted Ben to confirm that if the 100-foot setback were maintained from the RP-1 wetland and no RP-2 wetlands were directly impacted that no Resource Protection permitting would be required from the Cape Elizabeth Planning Board. Further, since the project does not contain a building component and its disturbance of approximately 6,200 square feet is less than the 10,000 square feet threshold for a local Site Plan permit, the project would also not be required to receive a Site Plan permit from the Planning Board. Therefore, the project as currently proposed will not require any local permitting to proceed. A copy of a September 16, 2020 email from Ben McDougal in which he concurs that no local Site Plan or Resource Protection permitting from the Planning Board is included within Appendix D of this report.

### 7.2 State Level Permitting:

In order to assess the level of State permitting that would be required, Sebago sent an email to the DEP's Alison Sirois describing the proposed project conditions. The email explained the scope of the project, and attached to the email were the two alternatives and location map. We asked DEP to provide guidance as to the anticipated obstacles, issues, and concerns that may arise from this project and whether the turnaround footprint near Wetland A would create an issue that requires another DEP Natural Resource Protection Act (NRPA) permit.

Overall, the response from the DEP was favorable in that the project would be eligible for the DEP's abbreviated Permit-by-Rule (PBR) program under Section 15 in which both Inland Fisheries and Wildlife (IFW) and Department of Marine Resources (DMR) approvals are required for the timing of the construction work. Additionally, the DEP also noted their preference to restore the existing watercraft launch area to its natural condition rather than to repurpose the existing launch area into a dedicated beach access. By not repurposing the existing launch and restoring it instead, additional impacts to the resource would be minimized and avoided which follows two of the DEP's guiding principles. The DEP's opinion is that there are already many access points to the beach area and the proposed watercraft launch would also serve as an informal pedestrian access point.

Alison also noted that the alternative with the proposed turnaround would not create any additional permitting concerns. A copy of the March 26, 2020 response email from the DEP's Alison Sirois is included in Appendix D of this report.

### 7.3 Federal Level Permitting:

In order to assess the permitting for the federal review process, we engaged in email communications with Colin Greenan of the U.S. Army Corps of Engineering (USACE). Again, we reviewed the project goals with Mr. Greenan so that the permitting needs of the project could be assessed.

While the USACE has jurisdiction on direct impacts to all wetlands, they do not have an adjacency jurisdiction so activities occurring outside of wetland limits are not regulated by the USACE. Therefore, Colin Greenan's direction was that if there is no work proposed below the mean high waterline, and if no fill was placed below either the high tide line or in the waters of the United States, then this project would not trigger the need for an USACE permit. A copy of Mr. Greenan's March 26, 2020 email communication is included in Appendix D of this report.

### 7.4 Other Agency Considerations

There are also agencies within the state, such as U.S. Fish & Wildlife, Maine Department of Inland Fish & Wildlife (IF&W), the Department of Marine Resources (DMR), and the Maine Historical Preservation

Commission (MHPC) that can influence permitting and design issues of projects. Since the Maine DEP permit is being triggered, these other agencies would likely be involved in the review of the potential watercraft launch improvements. While the actual nature of these agencies responses to the proposed project will not be known until they are included in the DEP permitting process, the limited scope of the watercraft launch and its associated moderate impacts, which it should be noted are partially offset by the restoration of the existing ramp, should not create a significant adverse reaction from these agencies.

## **8.0 Estimated Costs of Construction**

Sebago has reviewed the potential costs associated with the construction of the new watercraft launch and the restoration of the existing ramp. Not included in these costs area legal fees to formalize the easement from the State, permitting fees or application preparation costs, final design costs, or compensation for bidding and construction assistance services.

Based on our review of the construction circumstances and unit pricing from previous Cape Elizabeth projects' bidding along with the consultation of costs contained within the RS Means 2019 edition, **we estimate a \$67,660 construction cost to build the new Watercraft Launch facility and a \$17,660 cost to restore the existing launch for a total estimated project cost of \$85,320.** It should be noted that a 25-percent contingency has been applied to arrive at these estimated costs. For a more detailed breakdown of this construction cost estimate, refer to the cost estimate spreadsheet in Appendix E of this report.

Sebago has estimated the quantities of materials that will be necessary to complete the proposed improvements and has developed the anticipated costs to construct the improvements based on 2019 dollars. Due to the Town's desire to apply for grant funds to construct a portion of the project and the high level of activity around the project area in the summer months, it is likely that the construction may not begin until the Fall of 2021. This schedule may in turn affect the estimated costs depending on the volatility of the contractor bidding climate at that time and the continually changing situation related to the current Covid-19 health crisis.

## **9.0 Conclusions**

Sebago has surveyed and prepared an Existing Conditions Plan that includes the result of our wetland delineation of the project area. The firm of S.W. Cole Engineering collaborated with the Town's Public Works Department to investigate the site's subsurface conditions. S.W. Cole then prepared a geotechnical report assessing the site's suitability to support a new watercraft launch facility from a subsurface soils perspective and provided construction recommendations to overcome the site's limitations.

Two preliminary options were presented to the Town Staff, the State of Maine Park representatives, and regulatory agencies to implement this watercraft launch project. From the feedback received on the two options, Sebago Technics has created a Watercraft Launch Preliminary Site and Grading Plan which we understand will be used as a basis for future final design, permitting, and funding considerations. This preliminary plan includes the installation of a crushed stone surfaced gravel access drive approach to a series of ramped concrete planks and would also feature a crushed stone surfaced turnaround area adjacent to the concrete plank ramp. Though this design creates more of an impact to the project site, the turnaround provides a more efficient use of the proposed launch area.

Based on the position of the State of Maine and the preferences of the Maine DEP, the repurposing of the existing gravel watercraft launch area into a pedestrian-only beach access has been eliminated from the proposed project, and instead the existing ramp area will be restored to a natural condition.

We anticipate a Maine DEP Permit-by-Rule application, but it is not expected that a local Planning Board permit or a U.S. Army Corps of Engineers will be necessary. Continued review by the State of Maine Department of Agriculture, Conservation, and Forestry's Bureau of Parks and Lands group should be anticipated and encouraged to occur as part of the easement procurement process. It should also be noted that although the State of Maine thoroughly supports the project and recognizes its improvement to the functionality and operations at both Kettle Cove State Park and Crescent Beach State Park, the State representatives have repeatedly stated that the State has no funds budgeted to assist in the construction of a new watercraft launch facility.

This report has investigated the feasibility for the Town to relocate the Kettle Cove Watercraft launch project which now will include the restoration of the existing ramp. The Town and Sebago have not solicited public feedback as part of this current planning and preliminary design process. Based on the existing conditions survey conducted by Sebago along with the wetlands, permitting, and siting evaluations of the preliminary watercraft launch design undertaken by Sebago in concert with the Town staff, it appears that such a project is readily achievable at an estimated project cost of \$85,320 which includes a 25-percent contingency.





**SEBAGO**  
TECHNICS

WWW.SEBAGOTECHNICS.COM  
75 John Roberts Rd., Suite 1A  
South Portland, ME 04106  
Tel. 207-200-2100

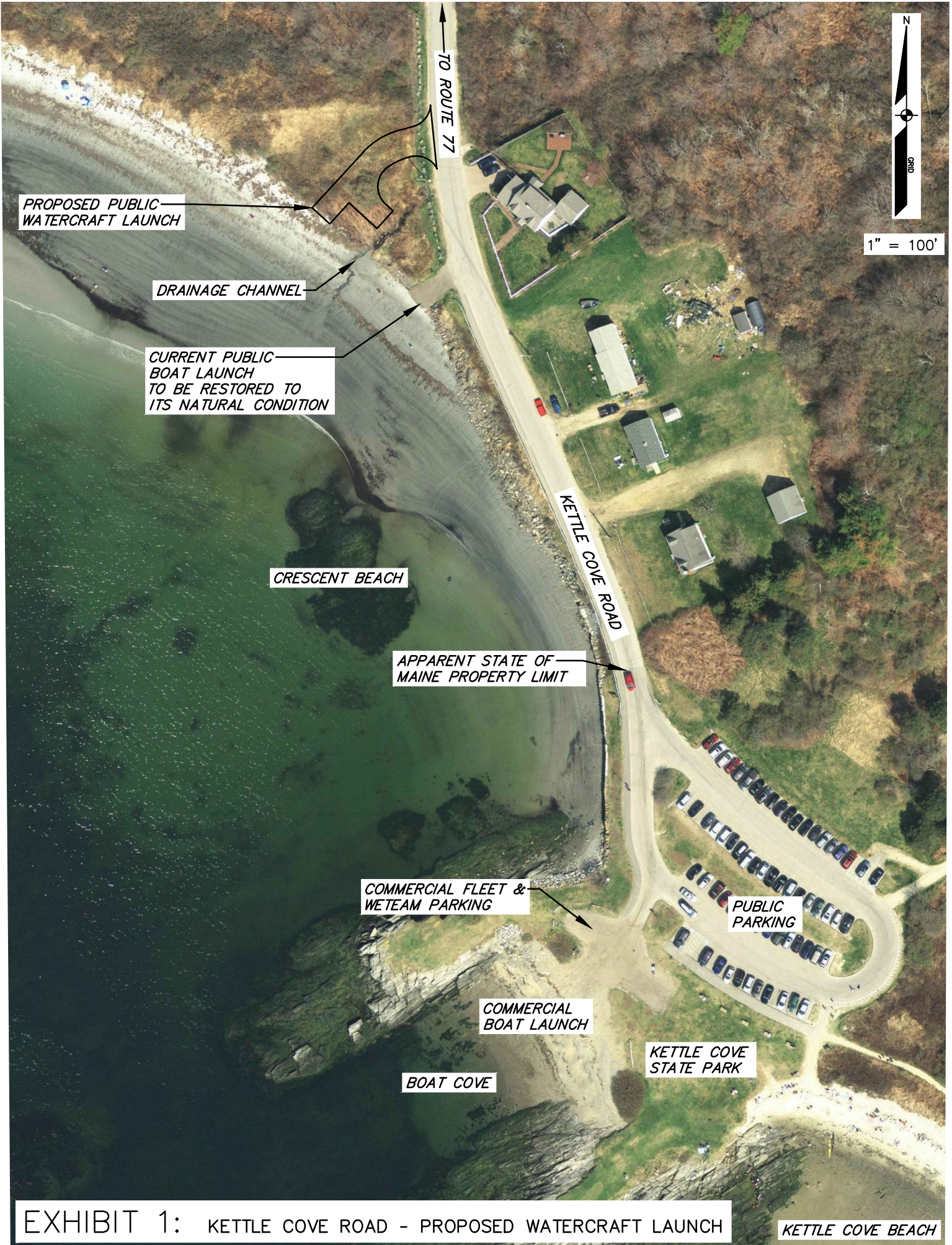
**SITE LOCATION MAP**  
**KETTLE COVE ROAD BOAT LAUNCH**

LOCATION: Kettle Cove Road  
Cape Elizabeth, ME

SCALE: 1" = 2,000'  
DATE: 03/25/2020

INFORMATION: ESRI USA\_Topo\_Maps  
USGS Quadrangle: Cape Elizabeth





PROPOSED PUBLIC WATERCRAFT LAUNCH

DRAINAGE CHANNEL

CURRENT PUBLIC BOAT LAUNCH TO BE RESTORED TO ITS NATURAL CONDITION

CRESCENT BEACH

APPARENT STATE OF MAINE PROPERTY LIMIT

COMMERCIAL FLEET & WETEAM PARKING

PUBLIC PARKING

COMMERCIAL BOAT LAUNCH

BOAT COVE

KETTLE COVE STATE PARK

EXHIBIT 1: KETTLE COVE ROAD - PROPOSED WATERCRAFT LAUNCH

KETTLE COVE BEACH





Photo 1 (01/09/2020): Commercial Fisherman only area which is limited to commercial users and the Town's WETeam, located approximately 700 feet south from the project site.



Photo 2 (01/09/2020): Kettle Cove Road and sidewalk with existing metal guardrail.





Photo 3 (01/09/2020): Existing gravel watercraft launch and pedestrian access area with boat launch signage stating 'Permits Required for Access.' Sign at existing launch to be relocated to the new launch site.



Photo 4 (01/09/2020): Toe of existing watercraft launch area and displacement of gravel and riprap are shown in this image.





Photo 5 (01/09/2020): Manmade drainage swale (RP-2 Wetland A) located between existing and proposed watercraft launch areas.



Photo 6 (2/12/2020): Existing vegetation and shrub growth at proposed watercraft launch location.





Photo 7 (12/16/2019): Proposed watercraft launch to be located approximately 15 feet north from the existing light pole. Existing watercraft launch located is in the background.



Photo 8 (12/16/2019): Wetland delineation flag location north from the project site.





Photo 9 (12/16/2020): Test Pit #1 – facing north.



Photo 10 (12/16/2020): Test #2 on in left background and #3 in center of the photo – facing west.





Photo 11 (12/16/2019): Test Pit #2 and #3 in the background, test pit #4 in center of photo – facing west.



Photo 12 (12/16/2020): Test pit #5 – facing south.





Photo 13 (9/25/2020): Look east at the proposed watercraft launch location.



Photo 14 (9/25/2020): Looking north west along Crescent Beach, where watercraft launch would connect to the beach.

# REPORT

19-0229 S

January 29, 2020

## Explorations and Geotechnical Engineering Services

Proposed Boat Launch  
Kettle Cove Road  
Cape Elizabeth, Maine

**Prepared For:**

Town of Cape Elizabeth, Maine  
Attention: Robert Malley  
10 Cooper Drive  
Cape Elizabeth, Maine 04107

**Prepared By:**

S. W. Cole Engineering, Inc.  
286 Portland Road  
Gray, Maine 04039  
T: 207-657-2866



- *Geotechnical Engineering*
- *Construction Materials Testing and Special Inspections*
- *GeoEnvironmental Services*
- *Test Boring Explorations*

[www.swcole.com](http://www.swcole.com)

## TABLE OF CONTENTS

1.0 INTRODUCTION .....	1
1.1 Scope and Purpose .....	1
1.2 Site and Proposed Construction .....	1
2.0 EXPLORATION AND TESTING .....	2
2.1 Explorations .....	2
2.2 Testing .....	2
3.0 SUBSURFACE CONDITIONS .....	2
3.1 Soil and Bedrock .....	2
3.2 Groundwater .....	3
4.0 EVALUATION AND RECOMMENDATIONS .....	3
4.1 General Findings .....	3
4.2 Site and Subgrade Preparation .....	3
4.3 Excavation and Dewatering .....	4
4.4 Fill, Backfill and Compaction .....	5
4.5 Weather Considerations .....	6
4.6 Design Review and Construction Testing .....	6
5.0 CLOSURE .....	6
Appendix A	Limitations
Appendix B	Figures
Appendix C	Exploration Logs & Key
Appendix D	Laboratory Test Results

19-0229 S

January 29, 2020

Town of Cape Elizabeth, Maine  
Attention: Robert Malley  
10 Cooper Drive  
Cape Elizabeth, Maine 04107

Subject: Explorations and Geotechnical Engineering Services  
Proposed Boat Launch  
Kettle Cove Road  
Cape Elizabeth, Maine

Dear Bob:

In accordance with our Proposal, dated February 28, 2019, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

## **1.0 INTRODUCTION**

### **1.1 Scope and Purpose**

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to earthwork associated with the proposed construction. Our scope of services included test pit explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings and preparation of this report.

### **1.2 Site and Proposed Construction**

We understand the Town of Cape Elizabeth is exploring the option to relocate the Kettle Cove boat launch to a vacant vegetated lot to the north. We understand the proposed lot was historically used as a boat storage area and was filled sometime in the past. Existing grades generally slope down towards the Crescent Beach shoreline to the west, varying from approximately elevation 15 feet (project datum) along Kettle Cove

Road to 5 feet along the beach. We understand boat launch design is conceptual at this time but is anticipated to consist of a gravel surfaced approach off of Kettle Cove Road, transitioning to the sloped launch down to the beach and shoreline.

Existing site features are shown on the “Exploration Location Plan” attached in Appendix B.

## **2.0 EXPLORATION AND TESTING**

### **2.1 Explorations**

Five test pits (TP-1 through TP-5) were made at the site on October 30, 2019 by the Town of Cape Elizabeth Public Works. The exploration locations were selected by S. W. Cole Engineering, Inc. (S.W.COLE) in conjunction with the Town of Cape Elizabeth. The test pit locations were subsequently surveyed by Sebago Technics. The approximate exploration locations are shown on the “Exploration Location Plan” attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on the logs were provided by Sebago Technics.

### **2.2 Testing**

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. Results of organic and moisture content testing performed on a sample of the relic buried organics are shown on the test pit logs. The results of one grain size analysis are attached in Appendix D.

## **3.0 SUBSURFACE CONDITIONS**

### **3.1 Soil and Bedrock**

Underlying a surficial layer of vegetation and topsoil, the test pits generally encountered uncontrolled fill consisting of brown sand with varying portions of silt and roots extending to depths varying from about 1 to 2 feet overlying a relic buried layer of dark brown and black organics, peat, and wood extending to depths varying from about 2 to 3.5 feet. Underlying the relic organic layer, the test pits encountered native gray to orange-brown sand with varying portions of silt. The test pits were terminated in the native sand at depths varying from about 4 to 5 feet.



Refer to the attached logs for more detailed subsurface information.

### **3.2 Groundwater**

The soils encountered at the test pits were moist from the ground surface. Saturated soils and groundwater seepage were encountered in the native sand stratum at depths varying from about 4 to 5 feet. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate tidally and in response to periods of snowmelt and precipitation, as well as changes in site use.

## **4.0 EVALUATION AND RECOMMENDATIONS**

### **4.1 General Findings**

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle geotechnical considerations include:

- Up to approximately 3.5 feet of fill and relic buried organics were encountered at the test pits. The existing topsoil, fills and relic buried organics are unsuitable for support of the new boat launch and should be removed and replaced with compacted Gravel Borrow.
- We recommend the gravel approach be surfaced with 3 inches of Crushed Stone overlying at least 12-inches of compacted Base Aggregate. Consideration should be given to use of pre-cast concrete planks for the sloped boat launch to control erosion and armor the ramp against wave action.
- Imported Crushed Stone, Base Aggregate, and Gravel Borrow will be required for construction. Portions of the existing granular fill soils, free of organics, may be suitable for reuse during construction.
- Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer and Fall.

### **4.2 Site and Subgrade Preparation**

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits.

Surficial organics, roots and topsoil should be completely removed from areas of proposed fill and construction. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

As discussed, the existing fill and relic buried organics are unsuitable for support of the proposed boat launch. We recommend removing the fill and organics until undisturbed, non-organic, native sand is encountered. The over-excavation should extend 1-foot laterally outward from the edge of gravel section for every 1-foot of vertical depth (1H:1V bearing splay). Final cuts to subgrade should be made with a smooth-edged bucket to help reduce subgrade disturbance. The over-excavation should be backfilled with compacted Gravel Borrow.

Following over-excavation and replacement of the unsuitable soils, we recommend the gravel approach be surfaced with 3 inches of Crushed Stone meeting the requirements of MaineDOT 703.12 Aggregate for Crushed Stone Surfacing, overlying at least 12-inches of compacted Base Aggregate meeting the requirements of MaineDOT 703.06 Type C Aggregate for Base. Consideration should be given to use of pre-cast concrete planks for the sloped launch to control erosion and armor the ramp against wave action.

#### **4.3 Excavation and Dewatering**

Excavation work will generally encounter existing fills, buried relic organics, and native sands. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the subgrade soils.

Vibrations from construction should be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site. More restrictive vibration limits may be warranted in specific cases with sensitive equipment, historic structures or artifacts on-site or within close proximity.

Sumping and pumping dewatering techniques should be adequate to control groundwater in excavations above tide. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and

caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

#### **4.4 Fill, Backfill and Compaction**

We recommend the following fill and backfill materials: recycled products must also be tested in accordance with applicable environmental regulations and approved by a qualified environmental consultant.

Common Borrow: Fill to raise grades in landscape areas should be non-organic compactable earth meeting the requirements of 2014 MaineDOT Standard Specification 703.18 Common Borrow.

Gravel Borrow: Fill to raise grades and backfill over-excavations, should be gravelly sand meeting the requirements of 2014 MaineDOT Standard Specification 703.20 Gravel Borrow.

Base Aggregate: Base aggregate, used to for the gravel section of the boat launch, should be crushed gravel meeting the requirements of MaineDOT 703.06 Type C.

Crushed Stone Surfacing: Aggregate for surfacing the gravel section of the boat launch should be hard, durable crushed stone meeting the requirements of MaineDOT 703.12 Aggregate for Crushed Stone Surfacing.

Reuse of Site Soils: The relic organics are unsuitable for reuse beneath the boat launch, but may potentially be blended with mineral soil to make topsoil for landscape areas. The existing sandy fill soils and native sands may be suitable for reuse as Common Borrow provided they are free of roots and organics, and are at a compactable moisture content at the time of reuse.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as

determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory roller compactor having a static weight of at least 5 tons.

#### **4.5 Weather Considerations**

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades must be protected during freezing conditions. Fills should not be placed over frozen soils.

#### **4.6 Design Review and Construction Testing**

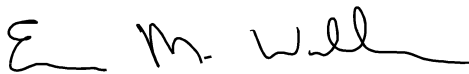
S.W.COLE should be retained to review the construction documents prior to bidding to determine that our earthwork recommendations have been properly interpreted and implemented. A soils testing program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities and provide field and laboratory testing of soil materials.

#### **5.0 CLOSURE**

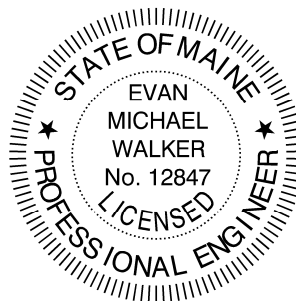
It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

**S. W. Cole Engineering, Inc.**



Evan M. Walker, P.E.  
Geotechnical Engineer



EMW:tjb

## **APPENDIX A**

### **Limitations**

This report has been prepared for the exclusive use of the Town of Cape Elizabeth, Maine for specific application to the proposed Boat Launch on Kettle Cove Road in Cape Elizabeth, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

## **APPENDIX B**

### **Figures**

N/F  
STATE OF MAINE  
CRESCENT BEACH  
MAP R10, LOT 34

POSSIBLE WETLAND AREA



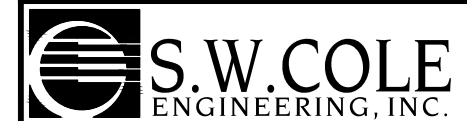
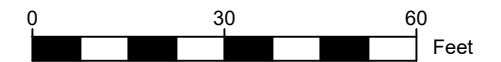
**LEGEND:**



APPROXIMATE TEST PIT LOCATION

**NOTES:**

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=20' SCALE PLAN OF THE SITE ENTITLED "EXISTING CONDITIONS PLAN," PREPARED BY SEBAGO TECHNICS, DATED 11/20/2019, AND PROVIDED AS A PORTABLE DOCUMENT FORMAT (PDF) FILE.
2. THE TEST PITS WERE LOCATED IN THE FIELD BY SURVEY BY SEBAGO TECHNICS AND PROVIDED ON THE ABOVE REFERENCED PLAN.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.



TOWN OF CAPE ELIZABETH  
**EXPLORATION LOCATION PLAN**

PROPOSED BOAT LAUNCH  
KETTLE COVE ROAD  
CAPE ELIZABETH, MAINE

Job No.:	19-0229	Scale:	1" = 20'
Date :	01/29/2020	Sheet:	1

CRESCENT BEACH

KETTLE COVE ROAD

12" HDPE  
INV.=8.84  
BM-1  
HORIZONTAL NAIL CMP 282

EXISTING BOAT ACCESS

N/F  
STATE OF MAINE  
PARK & REC COMM  
3069/12  
MAP R03, LOT 44

R:\2019\19-0229\CAD\Drawings\19-0229 ELP.dwg, 1/29/2020 10:58:42 AM, 1:1, CEM, S. W. Cole Engineering, Inc.

## **APPENDIX C**

### **Exploration Logs and Key**





# TEST PIT LOGS

PROJECT NO.: 19-0229  
 LOGGED BY: Evan Walker  
 CONTRACTOR: Town of Cape Elizabeth  
 EQUIPMENT: Volvo BL70B Backhoe

CLIENT: Town of Cape Elizabeth, Maine  
 PROJECT: Proposed Boat Launch  
 LOCATION: Kettle Cove Road, Cape Elizabeth, Maine

## TEST PIT TP-1

DATE: 10/30/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 9.4' Surveyed COMPLETION DEPTH (FT): 4.2  
 WATER LEVEL DEPTHS (FT): 4 ft Moist from Surface, Seepage Below 4' REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H <sub>2</sub> O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
0.3		Vegetation / Topsoil (Fill)					
		Brown to orange-brown, fine to medium SAND, some silt, with rootlets (Fill)					
1.1		Gray-brown, silty fine to medium SAND (Probable Fill)					
1.5		Dark brown and black, PEAT and organics			⊗	2-2.5	w =446.1 % O =48.4 %
2.9		Gray-brown and orange-brown, fine to medum SAND, some silt					
			▽ 4				

Bottom of Exploration at 4.2 feet

## TEST PIT TP-2

DATE: 10/30/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 10' Surveyed COMPLETION DEPTH (FT): 4.9  
 WATER LEVEL DEPTHS (FT): 4.8 ft Moist from Surface, Seepage Below 4.8' REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H <sub>2</sub> O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
0.3		Vegetation / Topsoil (Fill)					
		Brown, fine SAND, trace gravel, trace silt, with rootlets (Fill)			⊗	1-1.5	
2.0		Dark brown and black, PEAT and organics, with wood and logs					
3.5		Orange-brown to gray SAND, trace to some silt					
			▽ 4.8				

Bottom of Exploration at 4.9 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**KEY TO NOTES AND SYMBOLS:**  
 Water Level  
 ▽ At time of Digging  
 ▼ At Completion of Digging  
 ▽ After Digging

q<sub>p</sub> = Pocket Penetrometer Strength, kips/sq.ft.



# TEST PIT LOGS

PROJECT NO.: 19-0229  
 LOGGED BY: Evan Walker  
 CONTRACTOR:  
 Town of Cape Elizabeth  
 EQUIPMENT:  
 Volvo BL70B Backhoe

CLIENT: Town of Cape Elizabeth, Maine  
 PROJECT: Proposed Boat Launch  
 LOCATION: Kettle Cove Road, Cape Elizabeth, Maine

## TEST PIT TP-3

DATE: 10/30/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 10.7' Surveyed COMPLETION DEPTH (FT): 5.0  
 WATER LEVEL DEPTHS (FT): ∇ 4.7 ft Moist from Surface, Seepage Below 4.7' REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H <sub>2</sub> O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Topsoil (Fill)					
0.5		Brown, fine to medium SAND, some silt, with rootlets (Fill)					
1.8		Dark brown and black, PEAT and organics					
3.0		Gray, medium SAND, trace to some silt					
5			∇ 4.7				

Bottom of Exploration at 5.0 feet

## TEST PIT TP-4

DATE: 10/30/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 12' Surveyed COMPLETION DEPTH (FT): 5.0  
 WATER LEVEL DEPTHS (FT): ∇ 4.8 ft Moist from Surface, Seepage Below 4.8' REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H <sub>2</sub> O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Topsoil (Fill)					
0.4		Brown, silty SAND, with rootlets (Fill)					
2.0		Dark brown and black, PEAT and organics			⊗	2-2.5	
3.0		Gray-brown, medium to coarse SAND, some fine gravel, trace to some silt					
5			∇ 4.8				

Bottom of Exploration at 5.0 feet

TEST PIT 19-0229.GPJ SWCE TEMPLATE.GDT 1/28/20

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**KEY TO NOTES AND SYMBOLS:**  
 Water Level  
 ∇ At time of Digging  
 ▼ At Completion of Digging  
 ▽ After Digging

q<sub>p</sub> = Pocket Penetrometer Strength, kips/sq.ft.



# TEST PIT LOGS

PROJECT NO.: 19-0229  
 LOGGED BY: Evan Walker  
 CONTRACTOR:  
 Town of Cape Elizabeth  
 EQUIPMENT:  
 Volvo BL70B Backhoe

CLIENT: Town of Cape Elizabeth, Maine  
 PROJECT: Proposed Boat Launch  
 LOCATION: Kettle Cove Road, Cape Elizabeth, Maine

## TEST PIT TP-5

DATE: 10/30/2019 LOCATION: See Exploration Location Plan SURFACE ELEVATION (FT): 12' Surveyed COMPLETION DEPTH (FT): 4.3  
 WATER LEVEL DEPTHS (FT): ∇ 4.2 ft Moist from Surface, Seepage Below 4.2' REMARKS:

Depth (feet)	Graphic Log	Stratum Description	H <sub>2</sub> O Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
0.2		Vegetation / Topsoil (Fill) Brown and orange-brown, SAND, some silt, with rootlets (Fill)					
1.1		Dark brown and black, silty SAND with organics and peat layers					
2.0		Gray-brown, SAND, some silt					
			∇ 4.2				

Bottom of Exploration at 4.3 feet

TEST PIT 19-0229.GPJ SWCE TEMPLATE.GDT 1/28/20

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**KEY TO NOTES AND SYMBOLS:**  
 Water Level  
 ∇ At time of Digging  
 ▼ At Completion of Digging  
 ▽ After Digging

q<sub>p</sub> = Pocket Penetrometer Strength, kips/sq.ft.

## **KEY TO NOTES & SYMBOLS**

### **Test Boring and Test Pit Explorations**

Stratification lines represent the approximate boundary between soil types and the transition may be gradual.

#### **Key to Symbols Used:**

w	-	water content, percent (dry weight basis)
q <sub>u</sub>	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S <sub>v</sub>	-	field vane shear strength, kips/sq. ft.
L <sub>v</sub>	-	lab vane shear strength, kips/sq. ft.
q <sub>p</sub>	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W <sub>L</sub>	-	liquid limit - Atterberg test
W <sub>P</sub>	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ <sub>T</sub>	-	total soil weight
γ <sub>B</sub>	-	buoyant soil weight

#### **Description of Proportions:**

Trace:	0 to 5%
Some:	5 to 12%
“Y”	12 to 35%
And	35+%
With	Undifferentiated

#### **Description of Stratified Soils**

Parting:	0 to 1/16” thickness
Seam:	1/16” to 1/2” thickness
Layer:	½” to 12” thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

**REFUSAL: Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

**REFUSAL: Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

## **APPENDIX D**

### **Laboratory Test Results**



# Report of Gradation

ASTM C-117 & C-136

Project Name CAPE ELIZABETH ME - PROPOSED BOAT LAUNCH -  
GEOTECHNICAL ENGINEERING SERVICES

Project Number 19-0229

Client TOWN OF CAPE ELIZABETH, MAINE

Lab ID 25681G

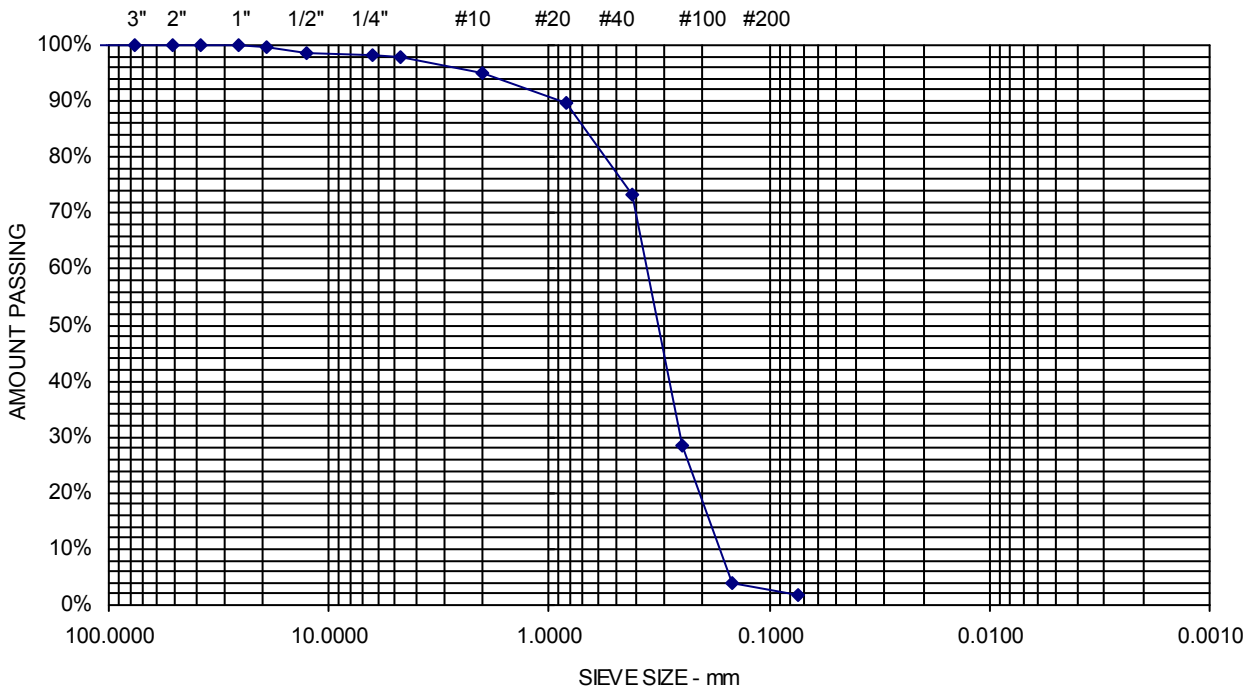
Date Received 11/5/2019

Date Completed 11/8/2019

Material Source TP-2 0.3'-2'

Tested By SARAH SYLVIA

<u>STANDARD DESIGNATION (mm/μm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	99	
6.3 mm	1/4"	98	
4.75 mm	No. 4	98	2.3% Gravel
2.00 mm	No. 10	95	
850 μm	No. 20	90	
425 μm	No. 40	73	96% Sand
250 μm	No. 60	28	
150 μm	No. 100	4	
75 μm	No. 200	1.7	1.7% Fines



Comments:



## *Memorandum*

**To: Steve Harding**

**From: Michael Jakubowski**

**Date: December 13, 2019**

**Subject: #19062 – Kettle Cove Boat Launch**

---

The wetlands on this site were delineated by Michael D. Jakubowski and Gary M. Fullerton of Sebago Technics, Inc. in December of 2019. This delineation conforms to the standards and methods outlined in the 1987 Wetlands Delineation Manual and Regional Supplement authored and published by the U.S. Army Corps of Engineers. The wetlands were marked in the field with alpha numeric pink “wetland delineation” flagging. The flags were then located using a Trimble gps backpack unit capable of decimeter accuracy.

Wetlands found are classified as scrub-shrub wetlands (PSS). PSS wetland vegetation at this site primarily consists of winterberry (*Ilex verticillata*), cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), and northern spicebush (*Lindera benzoin*). Wetland A is found between the proposed and existing boat launch areas and primarily serves as a manmade outlet for the manmade drainage system of Kettle Cove road. Wetland B is a large PSS community found north of the proposed boat launch and appears to be beyond the area considered for the proposed boat launch. Wetland B contains an RP-1 wetland based on “very poorly drained soils” identified on site by Gary M. Fullerton, Licensed Soil Scientist #462.

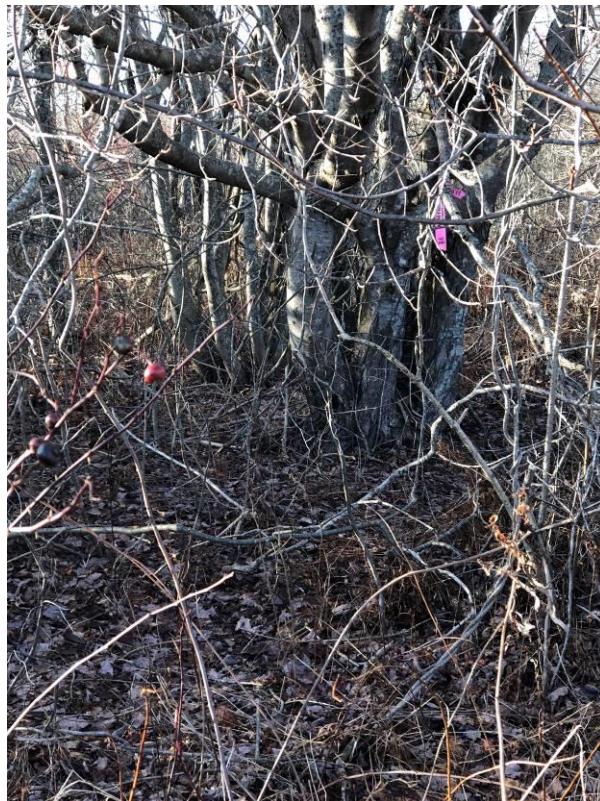
A vernal pool survey was not conducted at this site, however it is not suspected that there are vernal pools present in the delineated area because shallow depressions and typical amphibian forested habitats were not found in either wetland A or B. Streams were not found in the delineated area.

A handwritten signature in black ink, appearing to read "Michael Jakubowski", is written over a light blue horizontal line.





**Picture 1.** Wetland A with drainage from culvert under Kettle Cove Road.  
December, 2019.



**Picture 2.** Wetland B. December, 2019.



---

**From:** Benjamin McDougal <benjamin.mcdougal@capeelizabeth.org>  
**Sent:** Monday, March 9, 2020 3:24 PM  
**To:** Steve Harding  
**Cc:** Matthew Sturgis; Robert Malley; Maureen O'Meara; Justin Finnicum; Cory Cormier; 19062  
**Subject:** Re: kettle Cove Road Boat Ramp

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Steve,

Yes, I concur with your assessment of the RP-1 setback situation.

Regards,  
Ben

Benjamin McDougal  
Code Enforcement Officer  
Town of Cape Elizabeth  
320 Ocean House Road  
P.O. Box 6260  
Cape Elizabeth, ME 04107  
(207) 799-1619  
[benjamin.mcdougal@capeelizabeth.org](mailto:benjamin.mcdougal@capeelizabeth.org)

On Sun, Mar 8, 2020 at 8:59 PM Steve Harding <[sharding@sebagotechnics.com](mailto:sharding@sebagotechnics.com)> wrote:

Hi Ben and Matt –

Following our meeting on the subject project, we have gone out into the field and mapped the limit of the RP-1 wetland within the overall RP-2 wetland limits and have made adjustments to the preliminary ramp design. Attached are two views of a ramp design with one view showing the drainage pattern arrows of the existing terrain. The drainage pattern of the project area appears to drain directly to the ocean and not toward the wetland areas to the north which we believe would allow the Town to use the 100-foot setback from the RP-1 wetland and allow the ramp to be permissible under local zoning. Ben, can you let us know if you concur with our assessment.

Matt, we have not included the turnaround option as we wanted to be sure that Ben agreed with the premise that the 100-foot RP-1 wetland setback could be applied before creating that option. I assume that if Ben is in agreement that we should still consider the turnaround option as a possibility.

Also as an FYI, we are showing the 25-foot setback line off the limit of the RP-2 wetland as this is the criteria that the DEP would use to determine if the project could be approved under a Natural Resources Protection Act (NRPA) abbreviated Permit-by-Rule process for a ramp project. You can see that we are slightly into that setback on the wetland to the south. We could likely resolve that issue by skewing the end of the ramp closest to the beach, but we felt strongly that the ramp needs to have a perpendicular approach alignment to the ocean. Assuming that the Town Planning Board permit process is plausible, the next step would be to reach out to the DEP and the US Army Corps of Engineers for their assessment of the necessary State and Federal permits that would be required. At that time, we could discuss the parameters in detail with the DEP and get their assessment as to whether this option would qualify for the PBR process even with the slight grading that would be done in the 25-foot setback.

Let us know your thoughts and we will proceed accordingly.

Thanks, Steve

---

**From:** Steve Harding  
**Sent:** Wednesday, September 16, 2020 10:45 AM  
**To:** Benjamin McDougal  
**Cc:** 19062; Jodaliza Feliz  
**Subject:** RE: Kettle Cove Road

Thanks Ben. Appreciate the help with this project...Steve

---

**From:** Benjamin McDougal <[benjamin.mcdougal@capeelizabeth.org](mailto:benjamin.mcdougal@capeelizabeth.org)>  
**Sent:** Wednesday, September 16, 2020 9:53 AM  
**To:** Steve Harding <[sharding@sebagotechnics.com](mailto:sharding@sebagotechnics.com)>  
**Cc:** 19062 <[19062@sebagotechnics.com](mailto:19062@sebagotechnics.com)>; Jodaliza Feliz <[jfeliz@sebagotechnics.com](mailto:jfeliz@sebagotechnics.com)>  
**Subject:** Re: Kettle Cove Road

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Steve,

Yes, I concur with your assessment. No part of this project triggers site plan review or a Resource Protection Permit.

Regards,  
Ben

Benjamin McDougal  
Code Enforcement Officer  
Town of Cape Elizabeth  
320 Ocean House Road  
P.O. Box 6260  
Cape Elizabeth, ME 04107  
(207) 799-1619  
[benjamin.mcdougal@capeelizabeth.org](mailto:benjamin.mcdougal@capeelizabeth.org)

On Tue, Sep 15, 2020 at 5:13 PM Steve Harding <[sharding@sebagotechnics.com](mailto:sharding@sebagotechnics.com)> wrote:

Hi Ben –

Following up on our phone conversation of today, attached is the preferred alternative for the relocated boat launch off Kettle Cove Road. The total impacted area is approximately 6,200 square feet which is well below the 10,000 square foot threshold for Planning Board Site Plan review. With no buildings as part of the project and the project impacts beyond the 100-foot RP-1 setback that was established in previous communications, we believe that this project as proposed would not require a Planning Board approval. Do you concur with that assessment?

Thanks, Steve

**Stephen D. Harding, PE** *Senior Project Manager*

Sebago Technics, Inc. | An Employee-Owned Company

75 John Roberts Rd., Suite 4A, South Portland, ME 04106

Office: 207.200.2100 | Direct: 207.200.2057 | Cell: 207.749.3541

[sharding@sebagotechnics.com](mailto:sharding@sebagotechnics.com) | [www.sebagotechnics.com](http://www.sebagotechnics.com)



This notice and disclaimer regards the transmittal and use of electronic files generated and forwarded by Sebago Technics, Inc. This message contains confidential information and is intended only for the individual named. If you are not the named addressee, you should not disseminate, distribute or copy this email. Please notify the sender immediately by email if you have received this email by mistake and delete this email from your system. Email transmission cannot be guaranteed to be secure or error-free, as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender, therefore, does not accept liability for any errors or omissions in the contents of this message which arise as a result of email transmission. If verification is required, please request a hard-copy version. The information contained in these electronic files is privileged and confidential and is intended only for the use of the individual or entity stated in the address above. Any dissemination, distribution or copying of these electronic files is strictly prohibited. The recipient of the electronic file acknowledges and consents to the fact that the sender, Sebago Technics, Inc. makes no claim that electronic files are current, accurate or correct. Any use or reuse of the electronic file in any manner whatsoever is at the user's sole risk and the user agrees, to the fullest extent permitted by law, to hold Sebago Technics, Inc. harmless and to indemnify it from all claims, losses, damages, expenses and costs including all reasonable attorneys fees that may arise from its use or reuse.

**From:** Matthew Sturgis <matthew.sturgis@capeelizabeth.org>  
**Sent:** Thursday, May 14, 2020 1:40 PM  
**To:** Robert Malley; Steve Harding  
**Subject:** Fwd: Crescent Beach - Town Of Cape Elizabeth - Partnership - Recreational Watercraft Launch Permit and Access  
**Attachments:** Meeting Notes - May 14 2020 - CBSP Watercraft Launch.docx  
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged  
**Categories:** Important

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Bob and Steve,

Here is the latest information I have from Gary and Kurt on the Kettle Cove Access project.

Matt

----- Forwarded message -----

**From:** Best, Gary <[Gary.Best@maine.gov](mailto:Gary.Best@maine.gov)>  
**Date:** Thu, May 14, 2020 at 12:31 PM  
**Subject:** Crescent Beach - Town Of Cape Elizabeth - Partnership - Recreational Watercraft Launch Permit and Access  
**To:** Matthew Sturgis <[matthew.sturgis@capeelizabeth.org](mailto:matthew.sturgis@capeelizabeth.org)>  
**Cc:** Rodrigues, David <[David.Rodrigues@maine.gov](mailto:David.Rodrigues@maine.gov)>, Shoener, Kurt <[Kurt.Shoener@maine.gov](mailto:Kurt.Shoener@maine.gov)>

Hi Matt,

It was nice talking with you this morning. I attached our meeting notes. I was glad to hear your support and your agreement to make the improvements and changes outlined in the meeting notes to the watercraft launch license program and I am so pleased with the towns generous support for this enhancement to the park.

Now that we have had this discussion, which confirmed that we are in agreement with the project as outlined in the attached notes, we can move forward on this project.

**David Rodrigues - please draft a license to regulate this project, activity and partnership with the Town of Cape Elizabeth. As we discussed on May 8, I told Matt Sturgis, Town Manager that you will have a draft of the license for his review by July 14 (within two months).**

Thank you all for your work to get this exciting project to where it is today. This will be a significant improvement to the park.

*Gary Best*

State Park Regional Manager

Department of Agriculture, Conservation and Forestry

Bureau of Parks and Lands

107 State House Station

Augusta, Maine 04333-0107

(207) 215-6351



[www.parksandlands.com](http://www.parksandlands.com)

[Year-round Fun & Adventure at Maine's Parks and Lands!](#)

--

Matthew E Sturgis, CMA  
Town Manager  
Town of Cape Elizabeth

---

**From:** Sirois, Alison <Alison.Sirois@maine.gov>  
**Sent:** Thursday, April 2, 2020 11:55 AM  
**To:** Steve Harding; Greenan, Colin M CIV USARMY CENAE (USA); Langlois, Lucien  
**Cc:** Matthew Sturgis; Robert Malley; Maureen O'Meara; Rebecca Gabryszewski; Jodaliza Feliz  
**Subject:** RE: Cape Elizabeth Kettle Cove Proposed Boat Launch

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Steve,

After reviewing the proposed project, here are the Department's responses and comments. Let Lucien and I know if you have further questions.

- This project is located in a frontal dune of a Sand Dune system but the Section 15 PBR applicability states "*in or adjacent to a protected natural resource*" and sand dune systems are defined as a protected natural resources;
- Work within the 25 foot setback of a natural resource is not relevant in this case so the proposed turn-around is fine;
- Both IFW and DMR timing approvals will be are required for the Section 15 PBR
- The Department would like to see the existing boat launch restored to its natural state eliminating the concrete foot path proposed. We believe there are several access points to the resource already and that the new proposed launch location and turn around can serve as the access for foot traffic much like the existing launch does now. In our opinion, fully restoring the existing boat ramp back to its natural state will minimize and avoid new impacts to the resource.

Alison Sirois  
Regional Licensing and Compliance Manager, Southern Maine  
Bureau of Land Resources, Maine Department of Environmental Protection  
Phone (207)699-7028 Office (207)822-6300  
[www.maine.gov/dep](http://www.maine.gov/dep)

May 14, 2020

## **Cape Elizabeth Watercraft Launch Access to Crescent Beach State Park Proposal Review**

Attendees: Matt Sturgis, Kurt Shoener, Gary Best

### Town Issuance of Launch Permits – Requirements/Changes

- Rename permit – watercraft launch permit
- Town continues to issue permit and receive payment
  - Day and season permits are approved by BPL provided that:
    - If there is a fee differential for resident vs nonresident the differential can't be greater than double the cost
    - Permits are issued to nonresidents, otherwise LWCF obligations might cause limitations or prohibition of this activity
    - Town will need to authorize the purchase of the season pass to nonresidents
    - All recipients of Watercraft Launch Permit need to purchase a Vehicle state park season pass prior to issuance of a watercraft launch permit
    - Town public messaging needs to be clear that this is for watercraft launching only
- Consider setting a limit on the number of permits issued
  - If there is a limit on the number of permits sold, then at least 25% need to be set aside for nonresidents
- Town PD assists park staff with patrols on beach to enforce compliance with permit use
- BPL will design and install signage in collaboration with the Town

### Review of boat launch plans

- Removal of pedestrian access on plans
  - Installation of guard rail to block the previous launch
    - Continuation of guard rail (required)
    - Living fence – Virginia rose? (optional)
    - Absolutely no pedestrian access to Crescent Beach
    - No paved sidewalk
  - Uncertain of surface material on vehicular access – gravel?
- BPL prefers the design with the turnaround
  - Turnaround needs to be signed with no parking – towaway zone

### Document authorizing construction, ongoing maintenance, and requirements of launch and watercraft launch permit

- License
  - Governor's Approval required
  - License to include
    - Construction



- Permitting
    - Army Corps permitting?
    - IFW – Plover/New England Cottontail habitat
    - Other?
  - Maintenance
    - Ongoing maintenance provided by town
  - Watercraft Launch Permit Regulations – Town obligations (listed above)
- First Step
  - Town needs to agree to all changes
    - Gary and Kurt communicate requirements to Town Officials
- Second Step
  - David R. drafts license
  - Agreement provided to the Town for review and signature two months after the town agrees to all changes
- LWCF possibilities
  - This project is eligible for 50% LWCF reimbursable funding
    - Competitive process
  - License is required for LWCF
  - Town Contacts Doug Beck
    - Application due end of May 2021
    - Project could start as early as third week of September 2021

---

**From:** Steve Harding  
**Sent:** Thursday, March 26, 2020 7:52 PM  
**To:** Sirois, Alison; Greenan, Colin M CIV USARMY CENAE (USA)  
**Cc:** Matthew Sturgis; Robert Malley; Maureen O'Meara; Rebecca Gabryszewski; Jodaliza Feliz  
**Subject:** Cape Elizabeth Kettle Cove Proposed Boat Launch  
**Attachments:** 19062\_LOCATION MAP.pdf; 2020-03-13 Updated SK-1.pdf; 16548-ACCESS PLAN EXHIBIT- 180226.pdf; 2020-03-13 Exhibit 1.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Alison and Colin –

Sebago Technics is assisting the Town of Cape Elizabeth in the study of a potential recreational boat ramp launch off Kettle Cove Road. The Location Map indicates the location of the project in the southern portion of Cape Elizabeth onto Crescent Beach. The Access Plan Exhibit shows the area of the existing public boat launch which is desired to be relocated to the north in an area that was historically used in the past for boat related uses. The existing boat launch is steeply graded and because of its direct orientation to the requires substantial maintenance to remain functional. Depending on tides and runoff events, a drainage ditch to the north of the boat launch often impedes access to Crescent Beach to the north.

Commercial fishermen and the Town water emergency team exclusively use the beach area to the south shown on the Access Plan Exhibit as Boat Cove. The Town and the State which operates Kettle Cove Beach discourage recreational uses from Boat Cove so the Town has been working with representatives of Maine Department of Agriculture, Conservation, and Forestry's Bureau of Parks and Lands to site the launch further to the north in more favorable terrain with unimpeded access to the nearby beach.

Attached are two concepts for the boat launch. Alternative 1 is a linear gravel drive approach to a series of concrete planks. Alternative 2 features a turnaround area to the drive near the concrete planks.

The location of the boat launch is driven by Cape Elizabeth's Resource Protection regulations for setbacks from an RP-1 wetland. Sebago has worked with the Code Enforcement Officer and determined that a 100-foot setback would meet the local regulations. Below is a brief wetland report as completed by Sebago in this area.

Alison - We are trying to maintain a 25-foot setback from any nearby wetlands to use the Boat Launch Permit-by-Rule process. Alternative 1 achieves that goal whereas the turnaround for Alternative 2 encroaches into the setback. Can the DEP guide us as to what obstacles/issues/concerns may arise from this project and whether the turnaround footprint in the setback is going to be a issue that requires another NRPA permit if the project doesn't impact any wetlands.

Colin – From an adjacency standpoint, it does not appear the Corps would get involved in this project. Can you advise us to the Corps' concerns and what permits would be involved in this project scope.

Thanks in advance for your help with this project. Steve

### **Kettle Cove Boat Launch Wetland Report**

*The wetlands on this site were delineated by Michael D. Jakubowski and Gary M. Fullerton of Sebago Technics, Inc. in December of 2019. This delineation conforms to the standards and methods outlined in the 1987 Wetlands Delineation Manual and Regional Supplement authored and published by the U.S. Army Corps of*

Engineers. The wetlands were marked in the field with alpha numeric pink “wetland delineation” flagging. The flags were then located using a Trimble gps backpack unit capable of decimeter accuracy.

Wetlands found are classified as scrub-shrub wetlands (PSS). PSS wetland vegetation at this site primarily consists of winterberry (*Ilex verticillata*), cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), and northern spicebush (*Lindera benzoin*). Wetland A is found between the proposed and existing boat launch areas and primarily serves as a manmade outlet for the manmade drainage system of Kettle Cove road. Wetland B is a large PSS community found north of the proposed boat launch and appears to be beyond the area considered for the proposed boat launch. Wetland B contains an RP-1 wetland based on “very poorly drained soils” identified on site by Gary M. Fullerton, Licensed Soil Scientist #462.

A vernal pool survey was not conducted at this site, however it is not suspected that there are vernal pools present in the delineated area because shallow depressions and typical amphibian forested habitats were not found in either wetland A or B. Streams were not found in the delineated area.

**Michael Jakubowski, Sebago Technics, Inc.**

**Stephen D. Harding, PE** *Senior Project Manager*

Sebago Technics, Inc. | An Employee-Owned Company  
75 John Roberts Rd., Suite 4A, South Portland, ME 04106  
Office: 207.200.2100 | Direct: 207.200.2057 | Cell: 207.749.3541  
[sharding@sebagotechnics.com](mailto:sharding@sebagotechnics.com) | [www.sebagotechnics.com](http://www.sebagotechnics.com)



This notice and disclaimer regards the transmittal and use of electronic files generated and forwarded by Sebago Technics, Inc. This message contains confidential information and is intended only for the individual named. If you are not the named addressee, you should not disseminate, distribute or copy this email. Please notify the sender immediately by email if you have received this email by mistake and delete this email from your system. Email transmission cannot be guaranteed to be secure or error-free, as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender, therefore, does not accept liability for any errors or omissions in the contents of this message which arise as a result of email transmission. If verification is required, please request a hard-copy version. The information contained in these electronic files is privileged and confidential and is intended only for the use of the individual or entity stated in the address above. Any dissemination, distribution or copying of these electronic files is strictly prohibited. The recipient of the electronic file acknowledges and consents to the fact that the sender, Sebago Technics, Inc. makes no claim that electronic files are current, accurate or correct. Any use or reuse of the electronic file in any manner whatsoever is at the user's sole risk and the user agrees, to the fullest extent permitted by law, to hold Sebago Technics, Inc. harmless and to indemnify it from all claims, losses, damages, expenses and costs including all reasonable attorneys fees that may arise from its use or reuse.

---

**From:** Greenan, Colin M CIV USARMY CENAE (USA) <Colin.M.Greenan@usace.army.mil>  
**Sent:** Friday, March 27, 2020 7:15 AM  
**To:** Steve Harding  
**Cc:** Matthew Sturgis; Robert Malley; Maureen O'Meara; Rebecca Gabryszewski; Jodaliza Feliz; Sirois, Alison  
**Subject:** RE: Cape Elizabeth Kettle Cove Proposed Boat Launch  
**Attachments:** WorkInWaterway2014.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Steve,

From the plans it appears that:

- There is no work proposed below the mean high waterline, and
- There is no fill proposed to be placed below the high tide line, and
- There is no fill proposed to be placed in waters of the U.S., including wetlands.

If these three statements are indeed true then no Corps permit is required. If any of these statements are incorrect, a Corps permit would be required.

I've attached a document that explains the Corps jurisdiction in more detail.

Thanks for checking in

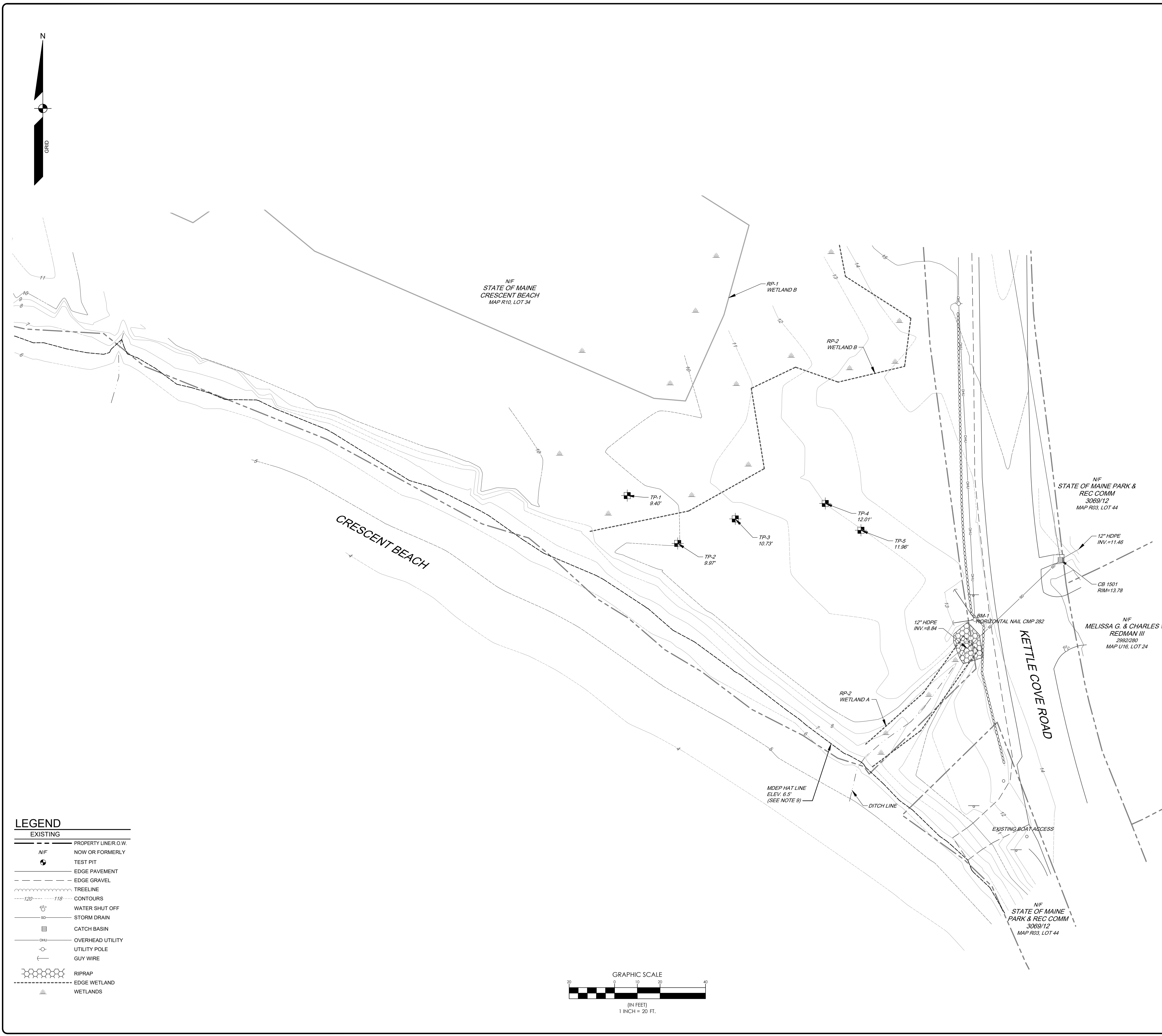
--

Colin M. Greenan  
Maine Project Office  
U.S. Army Corps of Engineers  
442 Civic Center Drive, Suite 350  
Augusta, Maine 04330

ph. (978) 318-8676

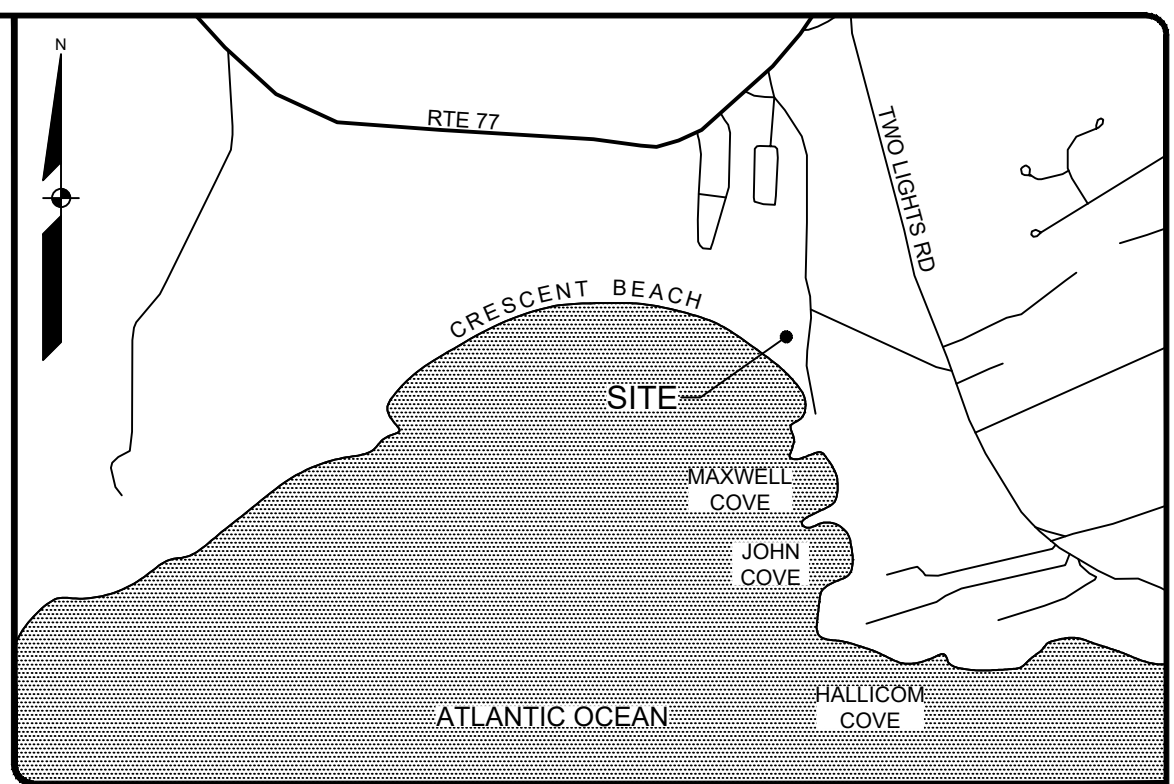
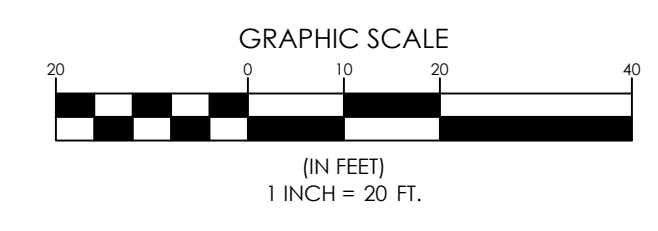
In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=136:4:0](http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0)

19062	<b>Kettle Cove Watercraft Launch</b>			<b>September 2020</b>	
	<b>PRELIMINARY DESIGN ESTIMATE</b>			<b>Sebago Technics, Inc.</b>	
Item	Item	Unit	Quantity	Unit Price	Total Amount
1	Concrete Planks	EA	6	\$ 900.00	\$ 5,400.00
2	Riprap	LS	1	\$ 8,000.00	\$ 8,000.00
3	Common Excavation	CY	450	\$ 20.00	\$ 9,000.00
4	Crushed Stone MDOT 703.12	CY	30	\$ 45.00	\$ 1,350.00
5	Base Aggregate MDOT 703.06 Type C	CY	120	\$ 35.00	\$ 4,200.00
5	Gravel Borrow MDOT 703.20	CY	320	\$ 30.00	\$ 9,600.00
6	Common Borrow MDOT 703.18	CY	50	\$ 20.00	\$ 1,000.00
7	Site Restoration	LS	1	\$ 6,500.00	\$ 6,500.00
8	Traffic Control (signage, flaggers etc.)	LS	1	\$ 4,000.00	\$ 4,000.00
9	Erosion and Sediment Control	LS	1	\$ 2,500.00	\$ 2,500.00
10	Mobilization and General Conditions - 5%	LS	1	\$ 2,577.50	\$ 2,577.50
11	Contingency - 25%	LS	1	\$ 13,531.88	\$ 13,531.88
	<b>TOTAL</b>				<b>\$ 67,659.38</b>
19062	<b>Existing Watercraft Launch Restoration</b>			<b>September 2020</b>	
	<b>PRE-DESIGN ESTIMATE</b>			<b>Sebago Technics, Inc.</b>	
Item	Item	Unit	Quantity	Unit Price	Total Amount
1	Metal Guardrail	LF	40	\$ 150.00	\$ 6,000.00
2	Remove and Replace Metal Guardrail Terminal End	LS	1	\$ 1,500.00	\$ 1,500.00
3	Riprap	LS	1	\$ 2,000.00	\$ 2,000.00
4	Common Excavation	CY	25	\$ 20.00	\$ 500.00
5	Plantings	LS	1	\$ 1,500.00	\$ 1,500.00
6	Traffic Control (signage, flaggers etc.)	LS	1	\$ 1,200.00	\$ 1,200.00
7	Erosion and Sediment Control	LS	1	\$ 750.00	\$ 750.00
8	Mobilization and General Conditions - 5%	LS	1	\$ 672.50	\$ 672.50
9	Contingency - 25%	LS	1	\$ 3,530.63	\$ 3,530.63
	<b>TOTAL</b>				<b>\$ 17,653.13</b>
	<b>New Kettle Cove Watercraft Launch</b>				<b>\$ 67,659.38</b>
	<b>Existing Watercraft Launch Restoration</b>				<b>\$ 17,653.13</b>
	<b>Total Project Cost</b>				<b>\$ 85,312.50</b>



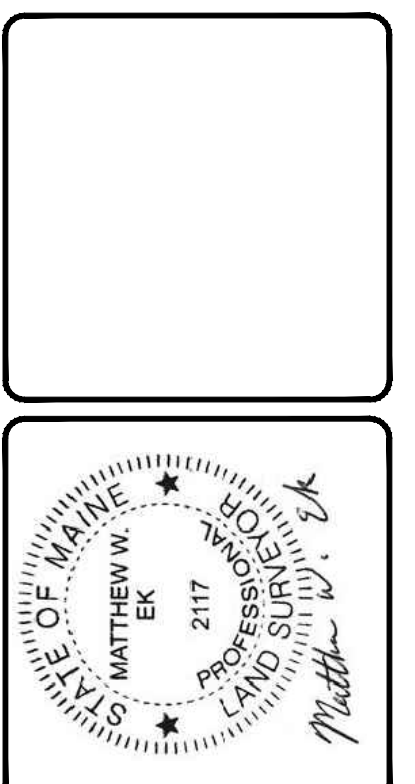
**LEGEND**

EXISTING	
---	PROPERTY LINE/R.O.W.
NF	NOW OR FORMERLY
⊙	TEST PIT
---	EDGE PAVEMENT
---	EDGE GRAVEL
~~~~~	TREELINE
---120---	CONTOURS
⊕	WATER SHUT OFF
---	STORM DRAIN
⊠	CATCH BASIN
OHU	OVERHEAD UTILITY
○	UTILITY POLE
←	GUY WIRE
⊞	RIPRAP
⊞	EDGE WETLAND
⊞	WETLANDS



**GENERAL NOTES:**

1. THE RECORD OWNER OF THE PARCEL IS STATE OF MAINE CRESCENT BEACH.
2. THE PROPERTY IS SHOWN AS LOT 34 ON THE TOWN OF CAPE ELIZABETH TAX MAP R10 AND IS LOCATED IN THE RESIDENCE A (RA) AND RESOURCE PROTECTION (RP1) DISTRICTS WITH A SHORELAND ZONE OVERLAY.
3. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON FIELD WORK PERFORMED BY SEBAGO TECHNICS, INC. ON NOVEMBER 4 AND 5, 2019.
4. BOUNDARY INFORMATION DEPICTED HEREON IS FROM CAPE ELIZABETH GIS PARCEL INFORMATION; SEBAGO TECHNICS HAS NOT PERFORMED A STANDARD BOUNDARY RETRACEMENT.
5. PLAN ORIENTATION IS GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83. ELEVATIONS DEPICTED HEREON ARE NAVD88, BASED ON DUAL FREQUENCY GPS OBSERVATIONS. FLOOD ELEVATIONS HAVE BEEN CONVERTED FROM NAVD88 TO NAVD83 BY ADDING 0.735 FEET TO NAVD88 ELEVATION.
6. BENCHMARK:  
BM-1 HORIZONTAL NAIL IN CMP UTILITY POLE 282 ELEVATION: 14.83 (NAVD88)
7. UTILITY INFORMATION DEPICTED HEREON, UNLESS OTHERWISE NOTED, IS OF QUALITY LEVEL D PER AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD GIASCCE 38-02. UTILITIES DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
8. THE LOCUS PROPERTY AS DEPICTED HEREON DOES WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR CAPE ELIZABETH, MAINE, CUMBERLAND COUNTY, COMMUNITY-PANEL NUMBER 230043 0011 D, HAVING AN EFFECTIVE DATE OF JULY 15, 1992. THE LOCUS FALLS WITHIN AN AREA IDENTIFIED AS ZONE A2 (FLOOD ELEVATION 14 NAVD83). AREAS OF 100-YEAR FLOOD, BASE FLOOD ELEVATION AND FLOOD HAZARD FACTORS DETERMINED AND ZONE V2 (FLOOD ELEVATION 15 NAVD83) AREAS OF 100-YEAR COSTAL FLOOD WITH VELOCITY (WAVE ACTION); BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTOR DETERMINED.
9. THE HIGHEST ANNUAL TIDE (HAT) LINE OF 6.5 FEET SHOWN HEREON IS BASED UPON THE LATEST CHART BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION DATED 2018. THE CLOSEST POINT ON THE CHART TO THIS PROJECT AREA WAS SELECTED AS PINE POINT, SCARBOROUGH.
10. A WETLAND DELINEATION WAS PERFORMED ON THIS PROJECT SITE IN DECEMBER OF 2019 BY MIKE JAKUBOWSKI AND GARY FULLERTON, OF SEBAGO TECHNICS, INC. THIS DELINEATION CONFORMS TO THE STANDARDS AND METHODS OUTLINED IN THE 1987 WETLANDS DELINEATION MANUAL AND NORTHEAST REGIONAL SUPPLEMENT AUTHORED AND PUBLISHED BY THE U.S. ARMY CORPS OF ENGINEERS. ALL WETLAND FLAGS WERE LOCATED USING GLOBAL POSITIONING SYSTEMS (GPS) TECHNOLOGY CAPABLE OF SUBMETER ACCURACY.
11. FIVE TEST PITS WERE EXCAVATED ON OCTOBER 30, 2019 BY THE TOWN OF CAPE ELIZABETH PUBLIC WORKS DEPARTMENT. THE TEST PITS WITNESSED AND EVALUATED BY S. W. COLE ENGINEERING, INC. REFER TO S.W. COLE ENGINEERING'S JANUARY 29, 2020 GEOTECHNICAL REPORT FOR INFORMATION REGARDING SUBSURFACE CONDITIONS AND CONSTRUCTION RECOMMENDATIONS.



REV.	BY	DATE	STATUS
D	MWE	9/23/2020	ADDED RP1 WETLAND AND NOTE 11
C	MWE	2/21/2020	WETLANDS UPDATED PER ENVIRONMENTAL STAFF REVIEW
B	MWE	2/2/2020	ADDED MDEP HAT LINE
A	MWE	11/20/19	ISSUED TO CLIENT FOR REVIEW

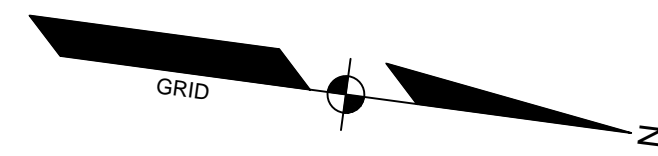
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

**SEBAGO TECHNICS**  
 WWW.SEAGOTECHNICS.COM  
 75 John Roberts Rd.  
 South Portland, ME 04106  
 Tel. 207-200-2100

EXISTING CONDITIONS PLAN  
 OF:  
 KETTLE COVE ROAD BOAT LAUNCH  
 KETTLE COVE ROAD  
 CAPE ELIZABETH, ME  
 FOR:  
 TOWN OF CAPE ELIZABETH  
 320 OCEAN ROAD  
 7 TOWER DRIVE  
 CAPE ELIZABETH, ME 04107

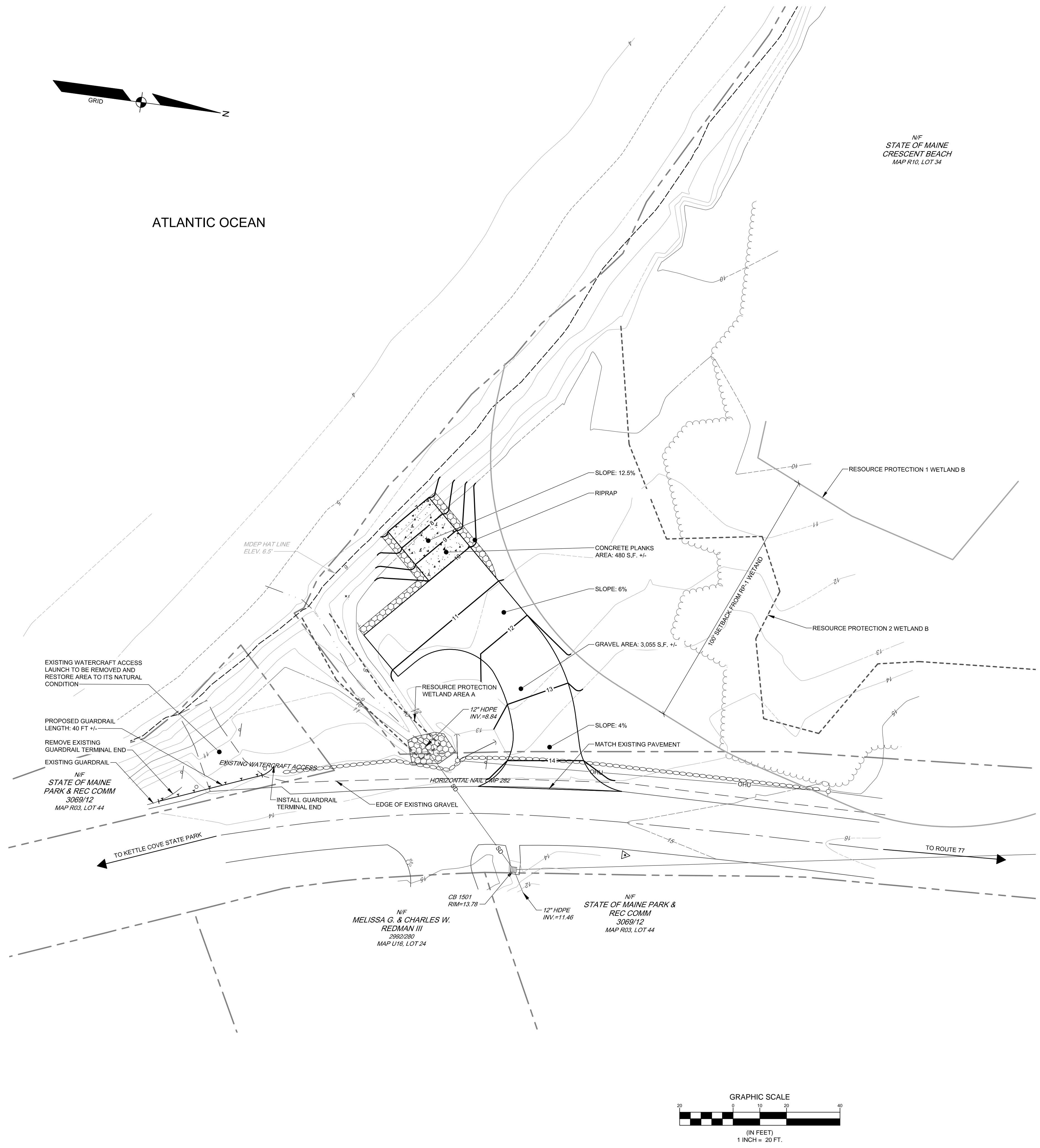
DESIGNED	-
DRAWN	TSL
CHECKED	MWE
DATE	11/19/19
SCALE	1" = 20'
PROJECT	19062





ATLANTIC OCEAN

NF  
STATE OF MAINE  
CRESCENT BEACH  
MAP R10, LOT 34



EXISTING WATERCRAFT ACCESS  
LAUNCH TO BE REMOVED AND  
RESTORE AREA TO ITS NATURAL  
CONDITION

PROPOSED GUARDRAIL  
LENGTH: 40 FT +/-  
REMOVE EXISTING  
GUARDRAIL TERMINAL END  
EXISTING GUARDRAIL

EXISTING WATERCRAFT ACCESS

RESOURCE PROTECTION  
WETLAND AREA A

12" HDPE  
INV.=8.84

HORIZONTAL NAIL 2x2

EDGE OF EXISTING GRAVEL

INSTALL GUARDRAIL  
TERMINAL END

12" HDPE  
INV.=11.46

MATCH EXISTING PAVEMENT

GRAVEL AREA: 3,055 S.F. +/-

SLOPE: 4%

CONCRETE PLANKS  
AREA: 480 S.F. +/-

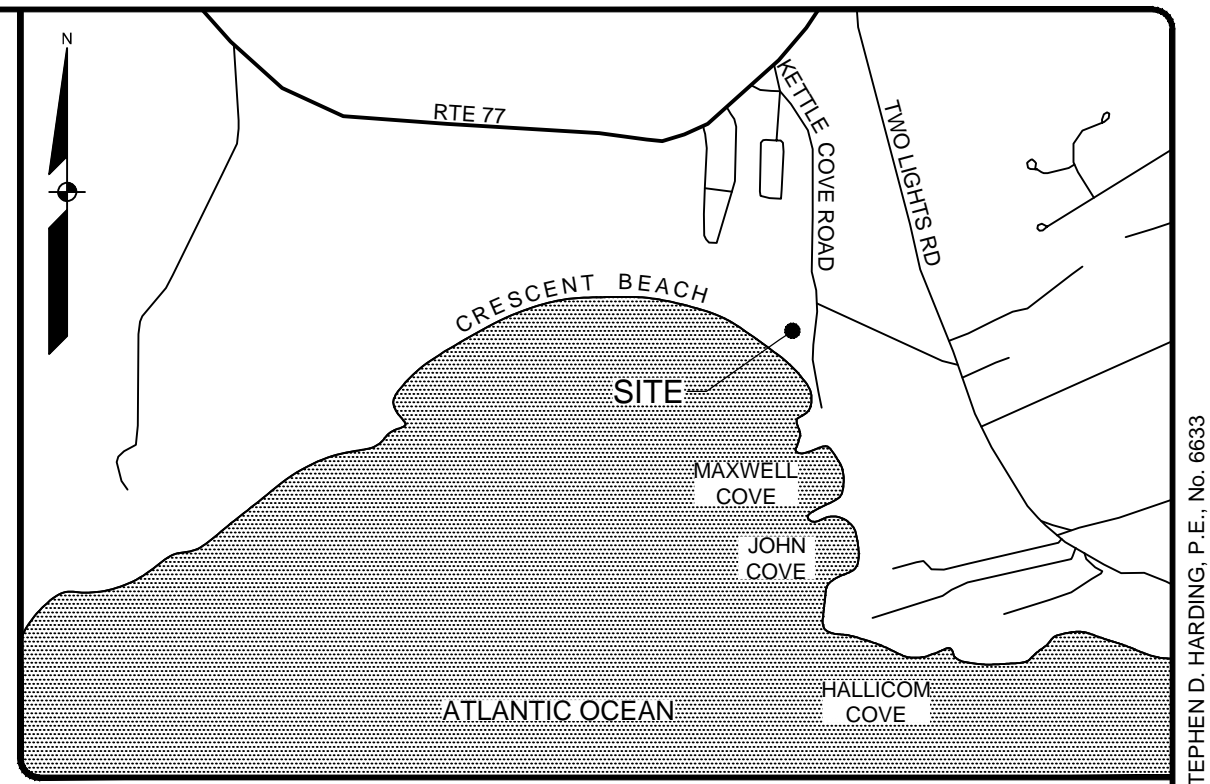
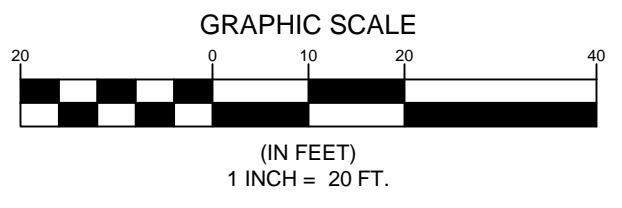
SLOPE: 6%

RIPRAP

SLOPE: 12.5%

RESOURCE PROTECTION 1 WETLAND B

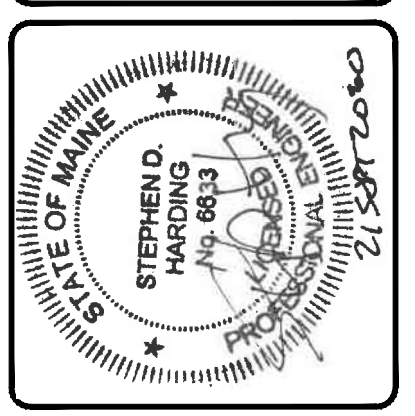
RESOURCE PROTECTION 2 WETLAND B



LOCATION MAP

N.T.S.

NOT FOR  
CONSTRUCTION



REV. BY:	DATE:	STATUS:	ISSUED FOR FINAL REPORT
B	SDH 09/21/2020	ADDED PROPOSED GUARDRAIL AT EXISTING WATERCRAFT LAUNCH	
A	SDH 09/16/2020	ISSUED FOR FINAL REPORT	

REVISIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNIQS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNIQS, INC.

**SEBAGO**  
TECHNIQS  
www.sebagotechniqs.com  
75 John Robbers Rd.  
South Portland, ME 04106  
Tel. 207-200-2100

PRELIMINARY SITE AND GRADING PLAN  
OF:  
**KETTLE COVE ROAD WATERCRAFT LAUNCH**  
KETTLE COVE ROAD  
CAPE ELIZABETH, ME  
FOR:  
**TOWN OF CAPE ELIZABETH**  
320 OCEAN ROAD  
CAPE ELIZABETH, ME 04107

DESIGNED	JF
DRAWN	JF
CHECKED	SDH
DATE	01/24/2020
SCALE	1" = 20'
PROJECT	19062

19062S-1.dwg, TAB: 19062S-1