

MEMORANDUM

DATE September 30, 2020

PROJECT NO. 2019-0072-00

TO Town of Braintree
Planning Department

FROM Woods Hole Group
Direct Phone: (508) 540-8080

Memorandum: Task 8 – Final Letter Report

This memorandum serves as a final report for the Watson Park Shoreline Erosion Mitigation and Coastal Resiliency Improvement project under the FY20 CZM Coastal Resilience Grant. This document summarizes the work done on the project during the FY20 time period and provides insight on lessons learned.

Additional Field Work

Although existing conditions were originally assessed during November 2018 under the FY19 grant, due to work starting so late in the season (i.e., work could not begin until a signed contract was received in November), the Project Team decided it was important to re-evaluate the coastal resource areas in October 2019, prior to the senescence of the salt marsh vegetation for the winter. As such, wetland resource areas were re-delineated and re-surveyed in October 2019, to ensure they were accurately mapped.

In addition to the verification of wetland resource areas, the FY20 work also included a shellfish survey. At the conclusion of the feasibility study and conceptual design phases in the previous grant cycle, it became clear that the footprint of the salt marsh restoration area under the preferred alternative would fall into areas of existing intertidal coastal beach and tidal flat – areas that could potentially contain shellfish. A shellfish survey was completed under the FY20 contract in November 2019. Although a low-density population of soft-shell clams was observed at the site, no clams were found within the proposed project footprint. Additionally, small areas of live oysters were found associated with some of the rocky intertidal shore habitats. A recent, field-based shellfish survey provided evidence that the preferred alternative would not result in adverse impacts to shellfish resources.

Lessons learned:

- The timing of the CZM Resilience Grant contracts (typically October of year 1 through June of year 2) makes seasonally dependent field work challenging. To ensure successful completion of these tasks, it's important to be able to mobilize quickly once contracting documents are signed and in place.

Development and Revision of Engineering Drawings and Plans

During the feasibility study and conceptual design phases of the FY19 grant, the general concept of a two-lobed salt marsh restoration plan was developed. At the time it seemed possible that the toe of the salt marsh fill could be stabilized with a combination of fiber rolls and vegetation. However, as more detailed engineering designs were developed, it became clear that the elevations of the face of the proposed fill and the tidal range



tolerance of salt marsh vegetation were mutually exclusive. In other words, the proposed elevations at the seaward toe of the salt marsh restoration fill will be too low in the tidal range to allow favorable wetting and drying cycles for salt marsh vegetation to survive. Therefore, in order to stabilize the front face of the salt marsh fill and ensure stability of the overall restoration design, another toe stabilization technique had to be used.

It was determined that a stone sill would be necessary at the toe of the restored salt marsh to stabilize the fill brought in to establish appropriate elevations for salt marsh restoration. A rock sill would not only stabilize the face of the salt marsh better than coir logs, but it would also mimic the substrate of the naturally rocky shoreline, providing additional rocky intertidal habitat. The target marsh platform elevation in initial design iterations was set at 4.0' NAVD88. This target elevation was based on the elevation of existing healthy marsh platform immediately east of the project area as a reference area. While this would be the ideal elevation for the salt marsh platform (and therefore the top of the rock sill), it did pose several design challenges. Based on feedback from the regulators that attended the MEPA preapplication on-site meeting in January 2020, we investigated ways that we could lower the elevation of the rock sill, thereby minimizing its footprint and the height of the vertical face, while still maintaining the goals of the restoration project. Additional field reconnaissance was done to measure the lower limit of healthy salt marsh at other reference sites to see if the crest elevation of the rock sill could be lowered. The lower limit of healthy salt marsh growth at two downstream locations was recorded at 1.9' and 2.4' (NAVD88). As a result, it was deemed feasible to lower the crest elevation of the eastern rock sill from 4.0' to 2.5' (NAVD88). This not only reduced the height of the visible front face of the rock sill, but also reduced the width of the rock sill footprint.

In addition to adjusting the height of the rock sill, various additional design modifications were also adopted, which resulted in the most effective design with the least adverse impacts. The front slope of the sill was adjusted to minimize the structure's overall footprint. In an effort to further minimize the overall footprint of the rock sill, the depth of burial for the rock sill toe stones was reduced to only 6 inches below grade with 6 inches of crushed stone beneath, compared to the full depth of toe armor stones that is typical with free-standing rock sill structures. This adjustment was deemed appropriate due to the relatively sheltered nature of this site and the fact that the potential wave scour would not be as intense as in other locations. Additional consideration was given to the size and type of materials that would be utilized to construct the rock sill. The size of the main stones used in the rock sill were selected to closely mimic the size of stone that is naturally occurring at the site in the nearby rocky intertidal shore areas: stones with a diameter of 18- to 30-inches. The voids between these stones would then be filled with 1- to 3-inch stone mixed with shell hash, with the intent that the incorporation of shell hash will promote the establishment of live shellfish beds.

Lessons learned:

- Multiple design iterations during the development of detailed engineering plans, including adding in a rock sill, proved to be more costly and time consuming than originally budgeted. For future jobs, when developing a budget for the development of engineering plans based on only a conceptual design concept, more time/budget should be allotted to the engineering and design tasks to ensure adequate time for full design development.
- Maintaining flexibility and exploring all design alternatives can result in an improved design and a less impactful project (e.g., reduced footprint, alternate materials, etc.).

Permitting Process and Agency Coordination

Initiating the permitting process for the Watson Park Shoreline Erosion Mitigation and Coastal Resiliency Improvement project was the main focus of the FY20 CZM Coastal Resilience Grant. The following permits were prepared and/or submitted:



- Expanded Environmental Notification From with MEPA
A pre-application on-site meeting was held with agency representatives in January 2020. This meeting was crucial in getting feedback from the regulators, getting input to refine the design, and hearing that regulators were generally onboard with the overall project concept. The ability to hold this meeting on-site was hugely informative to allow regulators to fully understand and observe the unique conditions at the site. The proposed rock sill design is only appropriate due to the unique rocky conditions already present at the site, which would have been harder to illustrate virtually. The Expanded Environmental Notification form was submitted on April 29, 2020, and a MEPA Certificate was issued on June 5, 2020. This certificate confirmed that no additional MEPA review was required.
- Two (2) Notice of Intent Applications with the Town of Braintree Conservation Commission
During initial conversations with representatives from MassDEP, it was determined that the most appropriate way to permit this project under the Massachusetts Wetlands Protection Act was to file it as two separate applications: 1) an Ecological Restoration Limited NOI application for the salt marsh restoration and coastal bank stabilization work and 2) a separate NOI application for the flood protection berm and rain gardens, which would be classified as redevelopment in a river front area. The additional time and effort to prepare a second NOI application had not been anticipated when the original FY20 grant application was submitted, but through consultation with CZM, a scope amendment was discussed and approved to accommodate this expanded task.

The Braintree Conservation Commission did not hold hearing for months due to the COVID-19 crisis. Upon reactivation of the Conservation Commission, the two NOI applications were submitted on June 30, 2020 and were placed on the August 6th agenda. The Commission had a number of questions and requested a series of minor changes to the design. The Ecological Restoration Limited NOI application for the salt marsh and coastal bank was approved and an Order of Conditions issued at the following meeting (September 3rd). Outstanding issues regarding relocating a memorial bench and mitigating for the removal of a numbers of mature trees extended the discussion of the second application, but it was ultimately approved, and an Order of Conditions was issued at the October 1st hearing.

- USACE Permit
As the next step in the permitting process, an Army Corps of Engineers Preconstruction Notification Application was prepared; this application incorporated the changed made during the Notice of Intent process. The Preconstruction Notification was filed on September 18, 2020. Since the application was only recently submitted, no comments or questions have been received from the agencies regarding this application as this time. The intention is to continue servicing this application and engaging with the agencies as part of the FY21 contract.
- Chapter 91 Permit from MassDEP Waterways
A Chapter 91 permit from MassDEP Waterways will be required for the proposed project because it involves new construction, dredging and filling activities in tidelands. The Project Team had originally anticipated the need to file a Chapter 401 Water Quality Certification as well. However, during initial conversations with DEP, it was mentioned that if there was less than 100 cubic yards of dredging, then this additional permit would not be required. When the refined design required only 86 cubic yards of dredging, the Chapter 401 Water Quality Certification task was removed from the amended scope of work (when the scope and budget were amended to accommodate additional the NOI application). Subsequent conversations with DEP brought to light that this certification would still be required due to



the proposed 260 cubic yards of fill required to build the salt marsh restoration platform. MassDEP further recommended at that time that a combined Chapter 91/401 permit be filed.

Ultimately, a single Chapter 91 permit application was prepared but not filed. The filing was delayed for two reasons. First, to wait for any feedback, comments and/or changes that may come out of the USACE permitting process. If changes are required, they will be incorporated into the draft Chapter 91 permit application prior to filing it with DEP. Second, as part of the FY21 contract, the material prepared as part of this Chapter 91 permit application will be reworked as part of a combined application at the recommendation of DEP during the MEPA review.

- **CZM Consistency Statement**

Because the proposed project requires a federal permit, a statement of consistency will be required by CZM. This consistency statement was prepared as part of this FY20 CZM Coastal Resiliency Grant, however, like the Chapter 91 permit, final submittal will be delayed until receiving feedback from other agencies and then adjustments made as necessary.

Lessons learned:

- Preparing and submitting permit applications for a complicated project such as this should be completed over a two-year grant cycle.
- In-person on-site pre-application meetings are hugely beneficial to fully demonstrate unique existing conditions to regulators.
- As schedules changed due to COVID-19, and required tasks shifted (e.g., the necessity for two rather than one Notice of Intent application), regular communication with CZM about necessary changes to the budget and scope was essential. With open communication, options could be discussed and changes to the scope and budget made as necessary to ensure success of the project.
- In some cases, local concerns (e.g., adjacent memorial bench, overlap with the rain garden footprint from a previous project, etc.), can slow the project down and require adjustments in design. Unfortunately, COVID-19 prohibited more in-depth public engagement around this project. For any future public projects, a more thorough understanding of the existing features and community values would streamline the design and permitting process.

Additional Planning Tasks

Two additional tasks that were completed under the FY20 contract included 1) developing a monitoring and maintenance plan and 2) developing construction cost estimates for the proposed project. The monitoring and maintenance plan detailed actions that would be taken to monitor and maintain all components of the project, including the salt marsh and rock sill, the stormwater outfall headwall, the stabilization coastal back, the earthen flood protection berm and the rain gardens. This document was submitted as part of the application package for the EENF, NOI applications and the USACE General Permit, and was therefore a critical component of the permitting process.

The development of construction cost estimates was largely done to assist the Town with planning for the funding that will be required for implementing the proposed project. Even if the Town is successful in receiving additional grant funding for implementation, a 25% match will still be required. The construction cost estimate provided in memorandum dated June 24, 2020, provided a detailed cost breakdown, separating the proposed construction costs into 21 separate items, for a more detailed understanding of the costs associated with various elements of the proposed project.



Next Steps

The Town of Braintree has been awarded a follow-on grant through CZM's FY21 Coastal Resilience Grant program. This contract will also the Watson Park Shoreline Erosion Mitigation and Coastal Resiliency Improvement project to advance through the following steps by June 30, 2021:

- Finalize the open permit applications (e.g., USACE permit);
- Prepare and file a combined Chapter 91 / Chapter 401 application with DEP;
- Revise (if necessary) and file the CZM Consistency Statement;
- Prepare and file the Town of Braintree Floodplain Permit; and
- Preparation of construction drawings and bid documents.

At the conclusion of the FY21 scope of work, the Town of Braintree will be prepared to initiate contractor selection and construction.