

**Monitoring, Management and Maintenance Plan for
the Schifter Site, 35 Pocha Pond Extension,
Edgartown, MA DEP Wetlands File No. SE 20-1303**

Introduction - Monitoring, Management and Maintenance Plan

The Coastal Bank Emergency Stabilization Work has been completed at the Schifter site at 35 Pocha Pond Extension, Edgartown, MA. This work is shown on "Proposed Plan of Emergency Stabilization System in Edgartown, Massachusetts, Assessor's Parcel 88-1.06 prepared for Richard P. & Jennifer D. Schifter, Scale 1"= 40-feet and Section A-A, prepared by Sourati Engineering Group, dated October 15, 2012, most recently revised January 9, 2013.

This work was completed on January 16, 2013 as located on the southern shoreline of the Schifter site (the subject site). The terraced coir envelope system (the system) was allowed by an Emergency Certification (EC) issued by the Edgartown Conservation Commission (ECC) on November 5, 2012. The EC allowed the emergency construction of terraced coir envelopes on the coastal bank face to be performed to abate the damage and erosion caused at the subject site by Hurricane Sandy. This system is composed of terraces of biodegradable natural materials that will last 2 to 5 years at a site. Each envelope is composed of two outer layers of coarse coir (coconut fiber) fabric and an inner, 10-oz natural burlap layer, designed to retain the sand sediment placed within the envelope.

The system has been reviewed as part of a Notice of Intent (NOI) filed under DEP File No. SE20-1303. The Applicant/Schifter has proposed this Monitoring, Management and Maintenance Plan as part of his commitment to a continuing coastal bank impact evaluation of the effectiveness of this coastal bank stabilization system and the maintenance of the approved Terraced Coir Envelope Protection along the southern shoreline of the subject site. This monitoring, management and maintenance plan is incorporated into the Order of Conditions that is being issued by the Edgartown Conservation Commission approving the project.

Section 1. Monitoring Program

- a. The applicant will provide a surveyed As-Built Plan created by Sourati Engineering Group, Inc and submit it to the ECC. This **As-Built Plan** will serve as documentation for the system construction in accordance with the approved project plan and the adjacent shoreline conditions upon the completion of system construction. The As-Built Plan conditions will also serve as the base plan for monitoring the envelope design and performance and the shoreline conditions to the east and west of the coir envelopes during the lifetime of the system.
- b. As of January 24, 2013, there is no evidence that the system is having an adverse impact on adjacent coastal wetland resources. The undisturbed portions of the coastal bank at the site are generally in line with the coastal bank to the west and east. At this time, natural erosional processes dominate along this shoreline and there is no evidence of system end-effect scour to the beach or bank. The As-Built Plan will document this initial condition at the site and the adjacent properties.
- c. The applicant will perform biweekly inspections of the Terraced Coir Envelope Protection System that has been constructed at the subject site to determine the effectiveness and condition of the system and any changes to the bank and beach in the project area from this initial condition.
- d. Monthly survey monitoring will be performed on the subject site along established survey transects. The locations of these transects are shown on the “**Project Monitoring Plan**” prepared by Sourati Engineering Group, Inc (SEG). This monitoring plan will be based on the SEG “Coastal Bank Erosion Study” plan, dated October 15, 2012, scale: 1-inch = 40-ft. An 1,100-ft baseline will be established in a shore-parallel (west to east) orientation.
- e. The survey baseline for this monitoring will be located in a position parallel to the current pool retaining wall alignment shown on the monitoring plan. Transects normal to the baseline will be established at 100-ft intervals. The first transect

(Transect A) will be established at the end of the retaining wall system at the Guest House and oriented at right angles to the baseline to monitor shoreline and beach elevation changes at the “Scallop” in the Coastal Bank at the West end of the Coir Envelope System. To monitor shoreline conditions to the east of Transect A, Transects B through G will be located to the east of Transect A at 100-ft intervals. At the easterly Schifter property line, the transect line will be rotated 30-degrees north to assure that topography on the beach is picked up. To monitor shoreline conditions to the west of Transect A (starting with Transects Z 100-ft west from Transect A) Transects Z through W will be located to the west of Transect A at 100-ft intervals. Regular measurements of the locations for the Top of Coastal Bank and Toe of Coastal Bank along these transects and topographic measurements of the beach conditions on either side of the coir envelope system so that the location of the Mean High Water Line (MHWL) can be tracked. Comparison of this data will be used to evaluate any updrift and downdrift impacts.

- f.** Based on the biweekly inspections of the coir envelope protection system, the applicant will provide for written Monthly Monitoring Reports to the ECC. These reports will be based on biweekly inspections and/or more frequent inspections required to document system and shoreline conditions after major coastal storm events. This monthly written reporting will include photographic documentation of system construction, system performance and measurements. The reports will be filed to the ECC the first week of each month after the installation is completed (system construction was completed January 16, 2013). A monitoring report was filed on January 7, 2013. The next report is due by February 8, 2013 and subsequent reports are due at the end of the first full week of each month.
- g.** In addition, within 36 hours of the end of any major coastal storm event, the site and erosion control system will be inspected to determine its condition, presence of any damage and the need for any repair. If necessary, measurements will be taken along established transects to document changes in the location of the Top of Coastal Bank, Toe of Coastal Bank,

beach elevations and approximate location of the Mean High Water Line. Photographs will be taken.

- h. Within 72 hours of the end of a coastal storm causing damage to the system, the ECC will be notified in writing of the nature and extent of any damage. The applicant will identify any repair work to be performed to maintain the system. Any repair work will be performed within seven (7) days of the end of the storm event.

Section 2. Management

- 1. General maintenance will be required on the existing Terraced Coir Envelope Protection System to keep it functional for the future protection of the existing Schifter dwellings and structures.

As constructed, the first layer of the coir terrace at the base of the coastal bank that is in contact with the saturated zone in the beach face and subject to the high surf and storm waves will need the most frequent maintenance. Since the coir material is natural and will deteriorate when saturated, it is anticipated that the envelopes that are presently at that lower level will begin to deteriorate (i.e. reduction in coir tensile strength, tearing of the envelopes, bleeding of sand) and need to be maintained.

Monitoring as described in Section 1 will identify any loss of geometry, envelopes shifting position and settling which are signs that maintenance is necessary. We anticipate this need will be evident within 3-4 months due to the impact by storm waves and high surf. We note that we are seeing the envelopes that were installed in late October prior to Hurricane Sandy, are beginning to fail. These envelopes were in a preliminary stage of construction when the Sandy hit and while they temporarily afforded important protection, were damaged during the storm.

- 2. General Clean-up measures will be conducted on an as-needed basis to recover deteriorated coir material. The applicant will have the project site and its immediate area periodically surveyed for the presence of coir material that can be recovered

and removed. But it may not realistic to expect that 100% of deteriorated coir can be kept in the project area during all high surf events. Therefore, the applicant will enter into a management agreement with The Trustees of Reservations (TTOR) for their periodic recovery and removal of any of the coir debris material that the TTOR finds on their property. In fact this management process is already in effect. While the bottom (pre-Sandy) envelopes are deteriorating, most of the matting was still present at the most recent evaluation. Regardless, should any coir envelope material migrate from the Schifter site to TTOR property either east, then north or west along the TTOR south shoreline, the applicant will pay for those TTOR cleanup activities. TTOR will submit invoices for their cleanup work to the ECC and the applicant and TTOR's costs will be deducted from the previously established Project Escrow Account.

Section 3. Maintenance Measures

The applicant anticipates that maintenance of the system will be required over the lifetime of the project to assure its effectiveness in protecting the bank and landward structures from erosion and potential damage. The upper portions of the Terraced Coir Envelope Protection System are anticipated to have a serviceable lifetime of 2 to 3 years at this site after which the coir will have naturally deteriorated due to sun, rain and salt exposure. Principally, the higher elevation, inner layers of upper portion of terraced coir envelope protection system will need only minimal maintenance; The outer layers in the upper portion will need patching where portions of the fabric may be weakened. However, the lower levels of the system will require frequent attention as those levels will deteriorate more rapidly due to sun, the presence of saturated conditions and storm damage.

1. Short-term maintenance will begin in the April/May 2013 time period to replace the deteriorated (pre-Sandy) bottom terrace of envelopes to protect the post-Sandy envelopes from more rapid deterioration. Similar repairs will probably be required at least twice a year, again principally to the bottom envelopes since any failure will most likely happen differentially, not uniformly across the length of the installation. This bottom envelope layer will be replaced as needed. We anticipate that maintaining/replacing the bottom

envelopes in the system will preserve the upper level envelopes for an extended period of time. This maintenance will be performed by machine located on the terrace immediately above the envelope system reaching down to the area requiring maintenance.

Maintenance will utilize temporary forms placed by hand within the shallow excavation at the system toe, over which new coir fabric is placed and then filled with sand already excavated from the site.

2. Cleaning up of any coir envelope debris will be necessary. Periodic monitoring of the Schifter site will identify and recover coir debris for proper disposal once the envelopes are drained of sand and are not performing any useful function.

Section 4. Mitigation

It is recognized that Mitigation measures may need to be implemented for unanticipated impacts. In the event that mitigation needs to be provided, the applicant will work co-operatively with the ECC to identify and permit necessary mitigation and provide for the following:

- a. A Mitigation Plan will be implemented if impacts are observed and documented to persist after a period of three (3) months.
- b. The Mitigation Plan will be based on the As-Built Plan, updated to show the identified area(s) of impact and will specify the measures to be undertaken at specific locations and during a specific period of time. Completion of the mitigation measures allowed by the ECC will then be documented in the next version of the Monitoring plan.
- c. For example, mitigation of downdrift (easterly of the system) impacts will typically be provided in the form of beach re-nourishment- the replacing of a specific volume of sand on the beach area adjacent to the east end of the coir envelope system. The approved project has temporarily stabilized 300-ft of 400-ft of the coastal bank at the subject site and sediment volume will be based on the stabilization to that portion of the bank. The necessary volume of sand will be placed along the easterly 100-ft of the unprotected shoreline on the Schifter site.