

# Living Shoreline Professionals Advanced Training

**August 24 & 31, 2017**

Hosted by

Virginia Institute of Marine Science  
College of William & Mary



**LIVING SHORELINE PROFESSIONALS  
ADVANCED TRAINING  
AUGUST 2017**

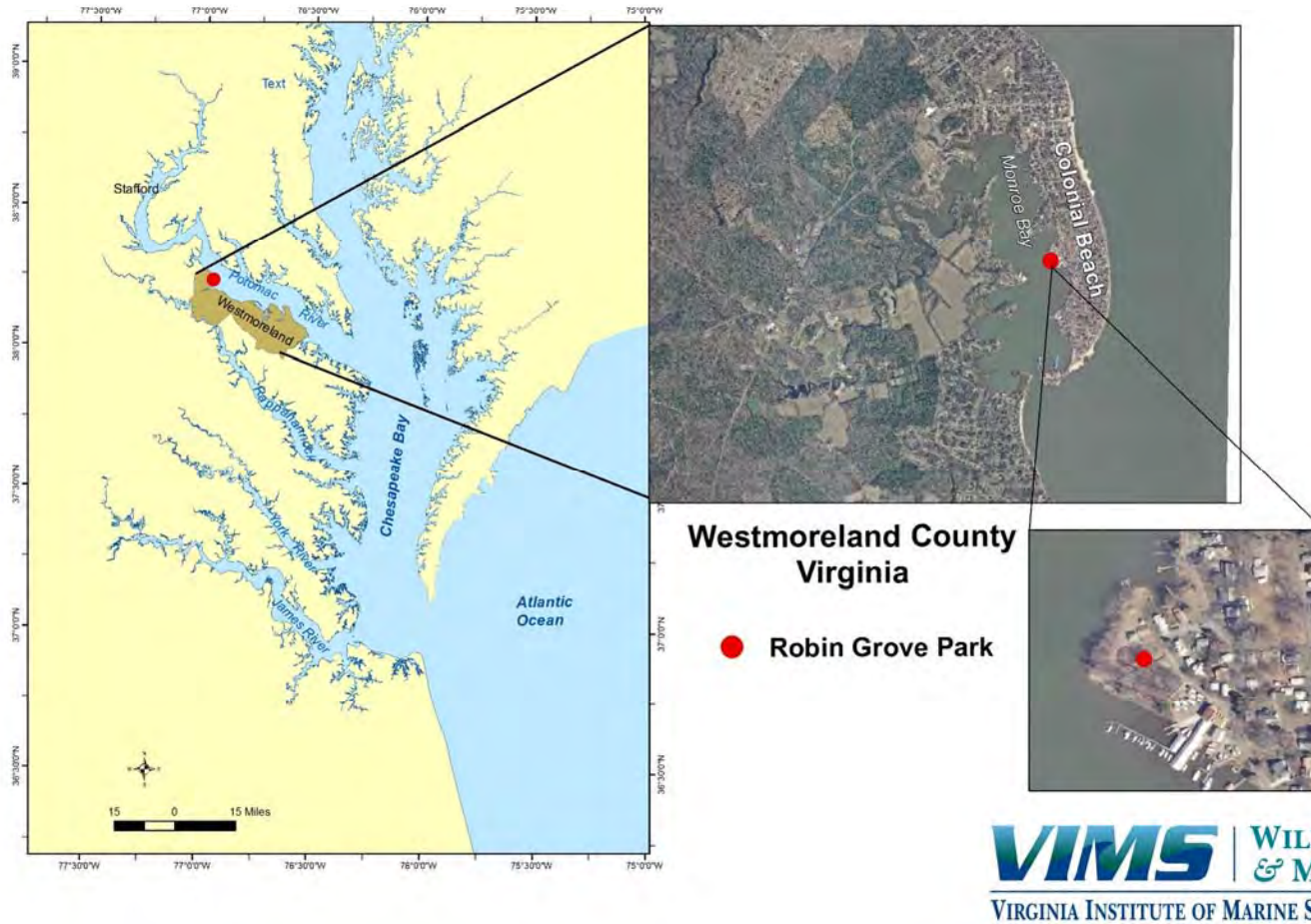
**Part 5**

**GROUP DESIGN EXERCISE**

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# Location







Google Map image of Robin Grove Park



Robin Grove Park is a locally-owned park in the Town of Colonial Beach. It exists on point in Monroe Bay. It has a limited fetch but could be impacted by boat wake from the marina. A treatment facility occupies a portion of the park and is surrounded by a fence.

# Shoreline Change



From the Shoreline Studies Shore Evolution Database

Shore Change Data: 1937 to 2009

- ◆ Very High Accretion:  $> +10$  (ft/yr)
- High Accretion:  $+10$  to  $+5$  (ft/yr)
- Medium Accretion:  $+5$  to  $+2$  (ft/yr)
- Low Accretion:  $+2$  to  $+1$  (ft/yr)
- Very Low Accretion:  $+1$  to  $0$  (ft/yr)
- Very Low Erosion:  $0$  to  $-1$  (ft/yr)
- Low Erosion:  $-1$  to  $-2$  (ft/yr)
- Medium Erosion:  $-2$  to  $-5$  (ft/yr)
- High Erosion:  $-5$  to  $-10$  (ft/yr)
- ◆ Very High Erosion

1937/38 Shoreline



2009 Shoreline



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[http://www.vims.edu/research/departments/physical/programs/ssp/gis\\_maps/index.php](http://www.vims.edu/research/departments/physical/programs/ssp/gis_maps/index.php)



# Location of Private Oyster Leases



CCRM Blue Infrastructure data

# Existing Conditions



Fence and park

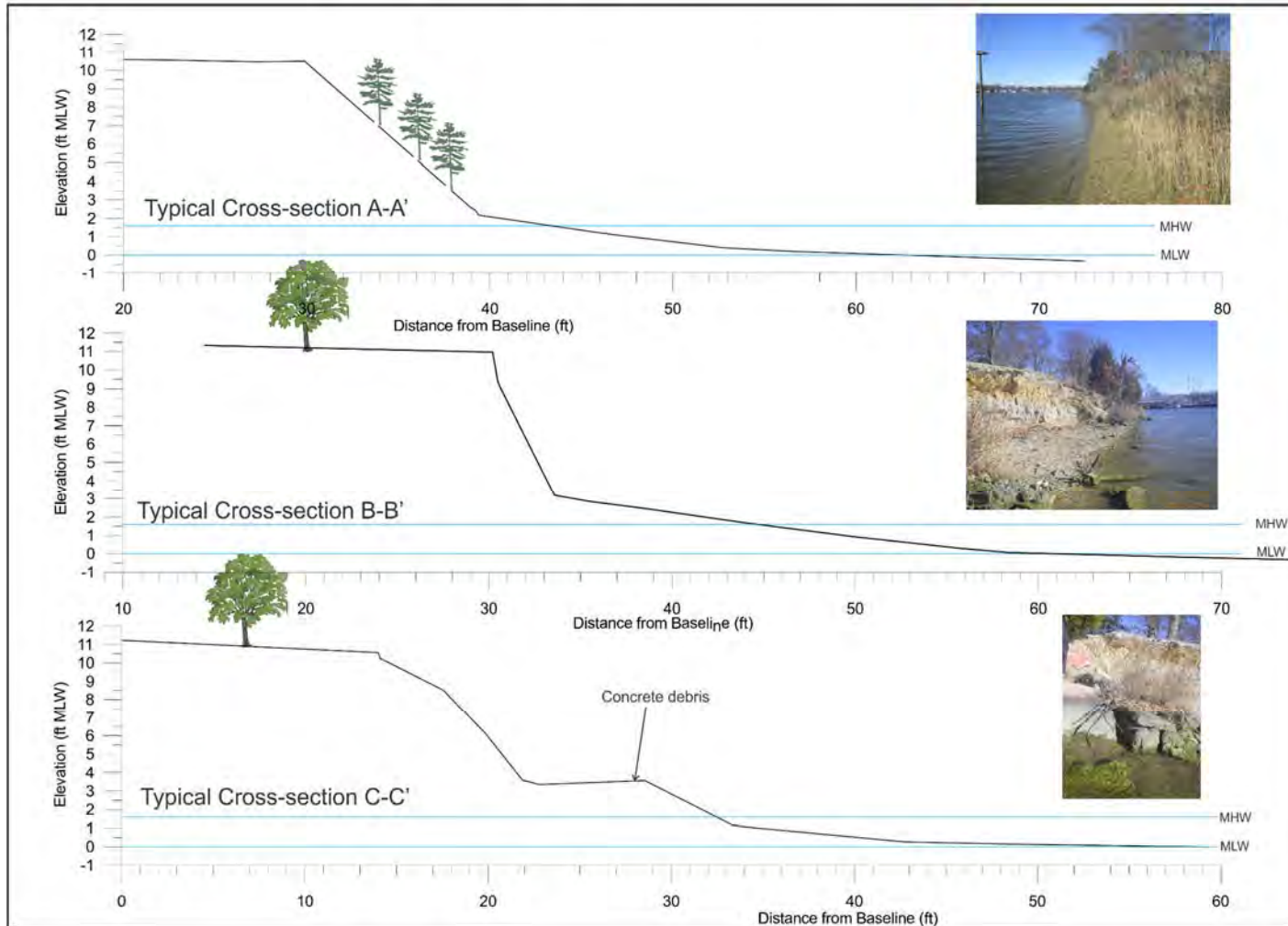


Shoreward fence and wooded bank



View from the Marina

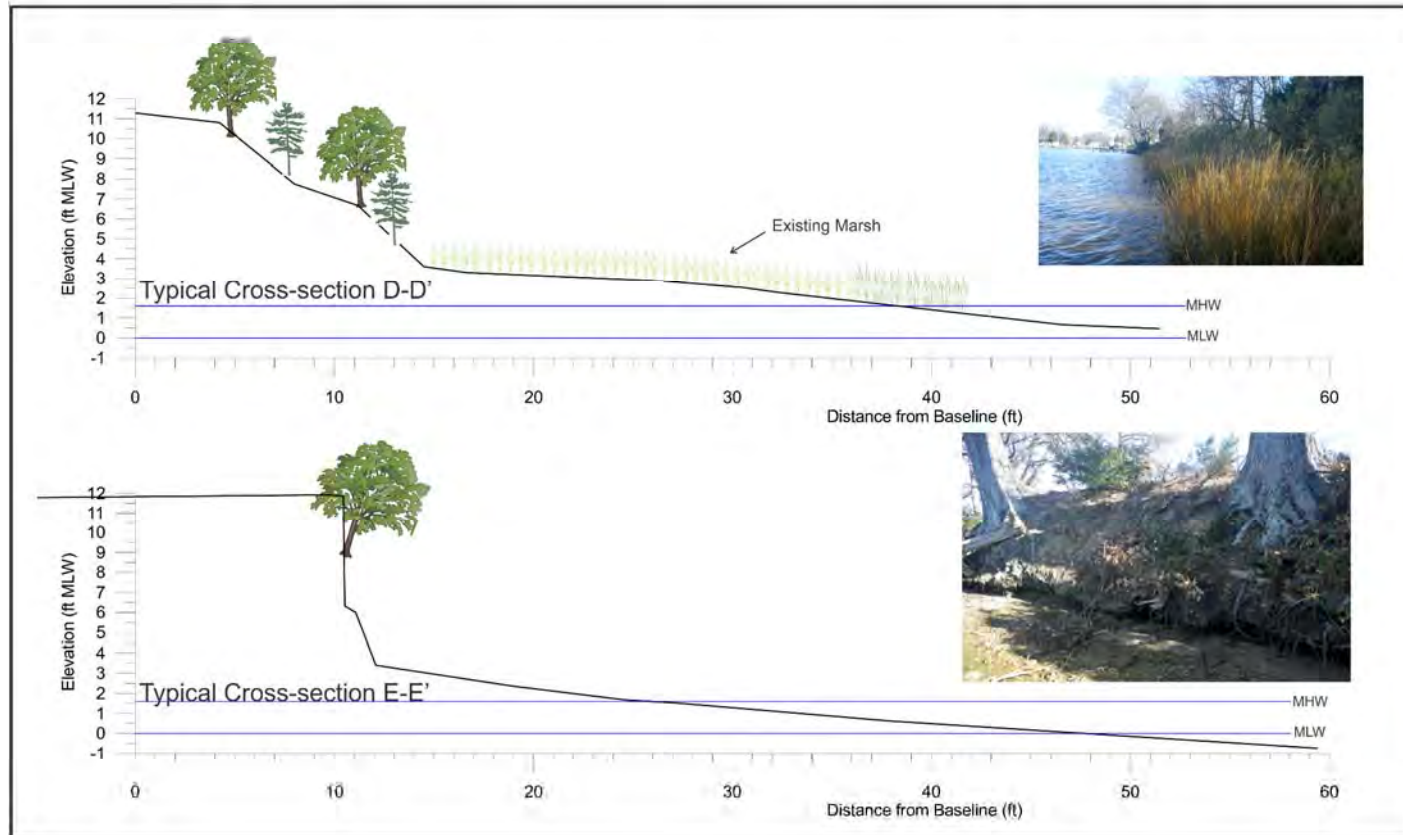
# Cross-Sections from Survey



These cross-sections show the elevation of the bank, shoreline, and nearshore, information needed to design a shore protection system.



# Cross-Sections from Survey



These cross-sections show the elevation of the bank, shoreline, and nearshore, information needed to design a shore protection system.

# Existing Conditions

Southwest facing shoreline



Southwest facing shoreline





# Existing Conditions

Point shoreline



Cross-section B-B'



Cross-section C-C'

Northwest facing shoreline



Looking from Point toward marsh



Cross-section D-D'



# Existing Conditions



Cross-section D-D'



Cross-section E-E'



Cross-section E-E'



End of Property

# Evaluation Sheet Information

**Site Evaluation**

Site Name Robin Grove Date \_\_\_\_\_  
 Site Locality Westmoreland Body of Water Monroe Bay

**Pre-Visit Parameters**

1. Shore Orientation(s): N NE E SE S SW W NW

Site Length: 750 (ft)

2. Average Fetch(es):  
 Very High (> 15 miles) High (5-15 miles) Medium (1-5 miles)  
 Low (0.5-1 miles) Very Low (< 0.5 miles)

Longest Fetch: 0.75 NW miles

3. Shore Morphology: Pocket Straight Headland Irregular

4. Distance to 6 ft Contour: 7300ft

5. Nearshore Morphology: Bars no Tidal Flats no

6. Nearshore Aquatic Vegetation: no

7. Tide Range: 1.6 ft

8. Storm Surge: 10 yr 5ft 50 yr 6.5 100 yr 7ft MLW

9. Erosion Rate:

Very High Accretion (> +10 ft/yr)	High Accretion (+10 to +5 ft/yr)
Medium Accretion (+5 to +2 ft/yr)	Low Accretion (+2 to +1 ft/yr)
Very Low Accretion (+1 to 0 ft/yr)	<u>Very Low Erosion (0 to -1 ft/yr)</u>
<u>Low Erosion (-1 to -2 ft/yr)</u>	Medium Erosion (-2 to -5 ft/yr)
High Erosion (-5 to -10 ft/yr)	Very High Erosion (< -10 ft/yr)

At point NW + SW face

10. Design Wave: Height 1ft Period 15

Notes:

38°14'28.07"N  
76°57'50.98"W

**Site Visit Parameters**

1. Site Boundaries: On image

2. Site Characteristics:  
 Upland Land Use Park and treatment plant  
 Proximity to Infrastructure Treatment plant fence is close to top of bank  
 Cover Mostly open with some trees on SW shoreline  
Heavily wooded on NW shoreline

3. Bank Condition:

Bank Face - <u>Erosional</u>	DD	EE	Undercut
Bank of Bank - <u>Erosional</u>	Stable	Transitional	Undercut
	Stable	Transitional	AA
	DD	AA	AA

4. Bank Height: EE

5. Bank Composition: SM

6. RPA Buffer:

7. Shore Zone: Sand  Marsh

Width Varies: See cross-section  
 Elevation

8. Backshore Zone: Sand  Marsh \_\_\_\_\_

Width Varies: See cross-section  
 Elevation

9. Boat Wakes: yes

10. Existing Shoreline Defensive Structures: no but construction debris at point

11. Nearshore Stability: Firm SW face Soft NW face

# Information Helpful for Design

Robin Grove Park, Colonial Beach, VA Existing Data





# Draw Your Design

Robin Grove Design



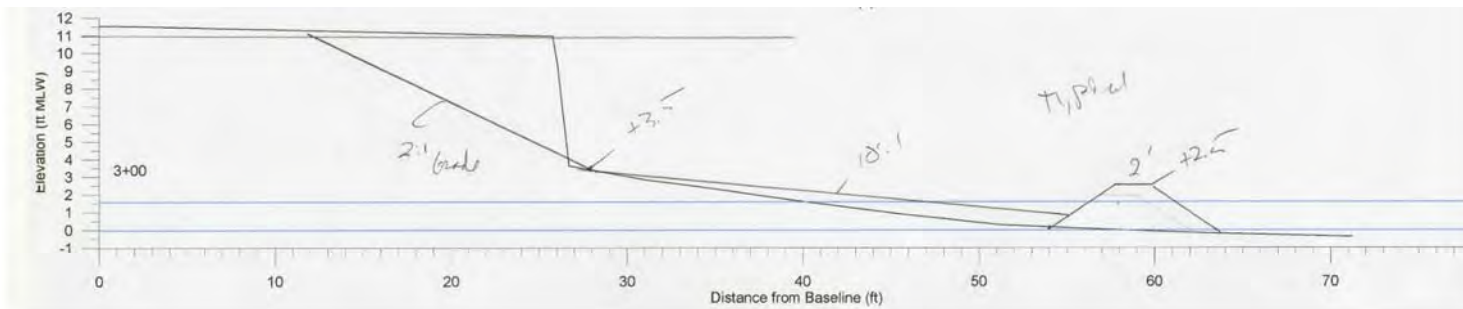
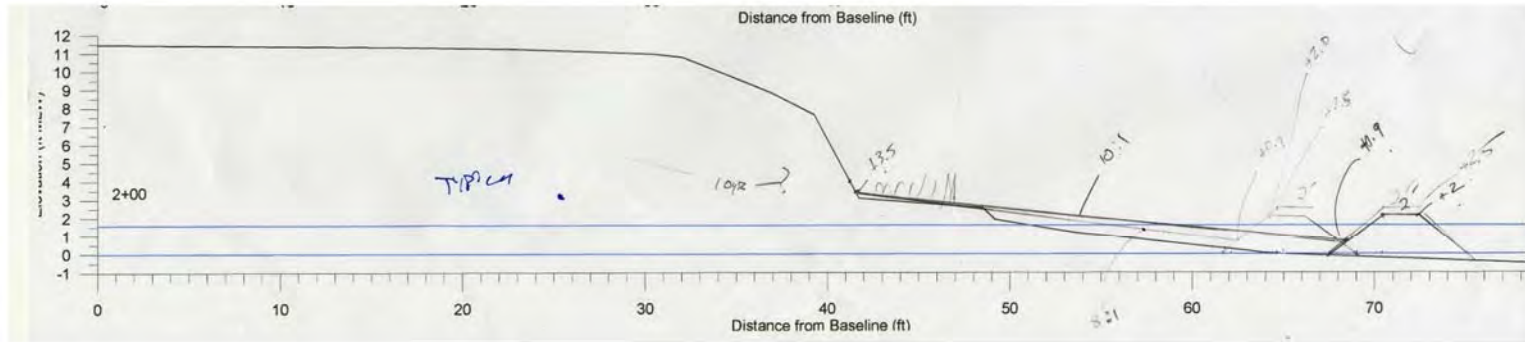
# One Possible Plan

# Initial Sketch

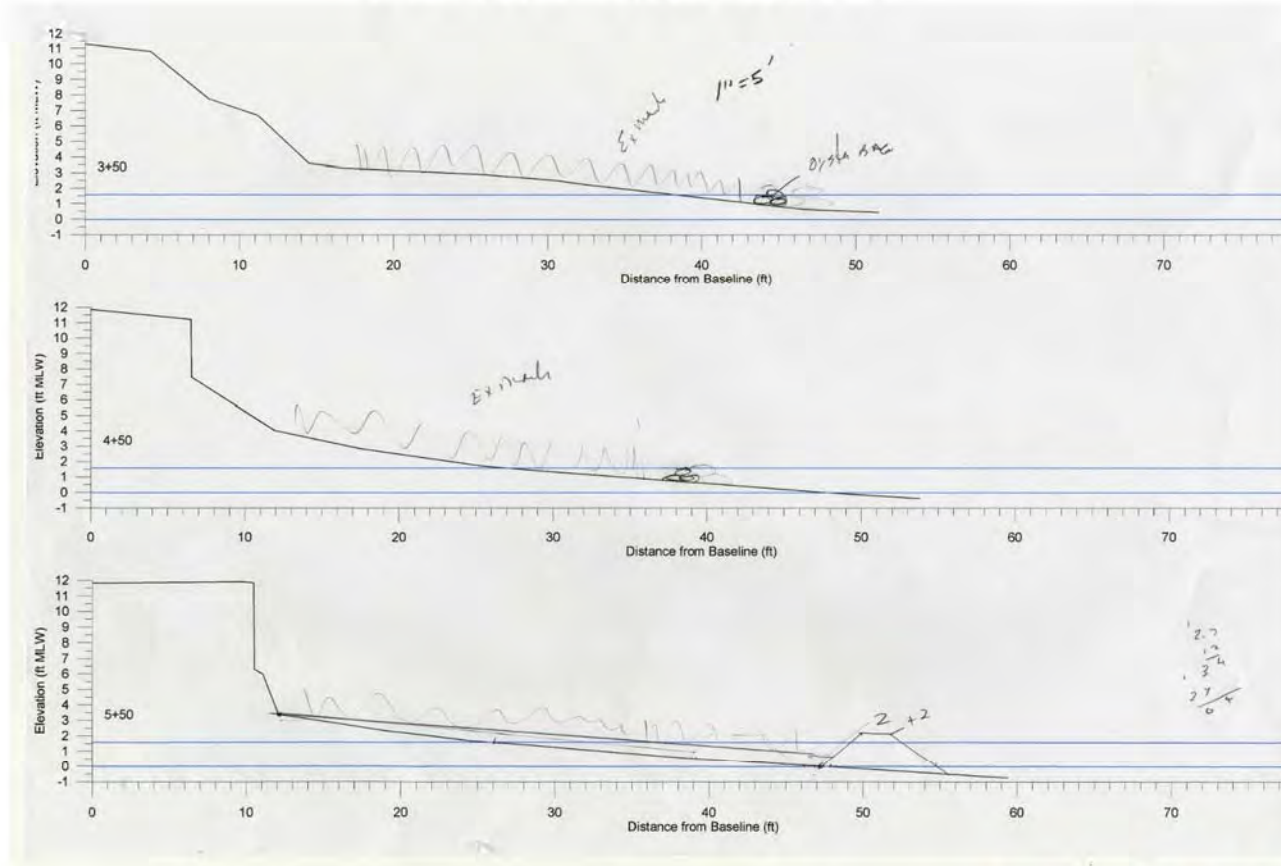




# Profile Sketches



# Profile Sketches



# One Plan

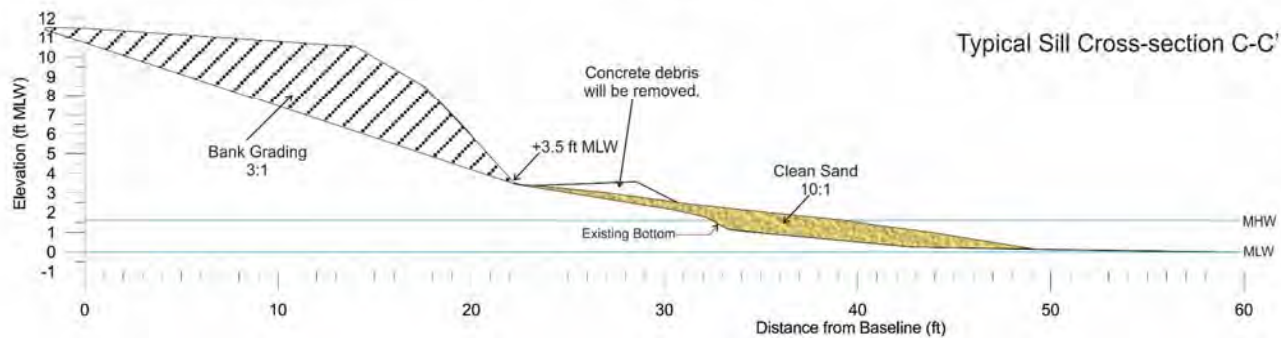
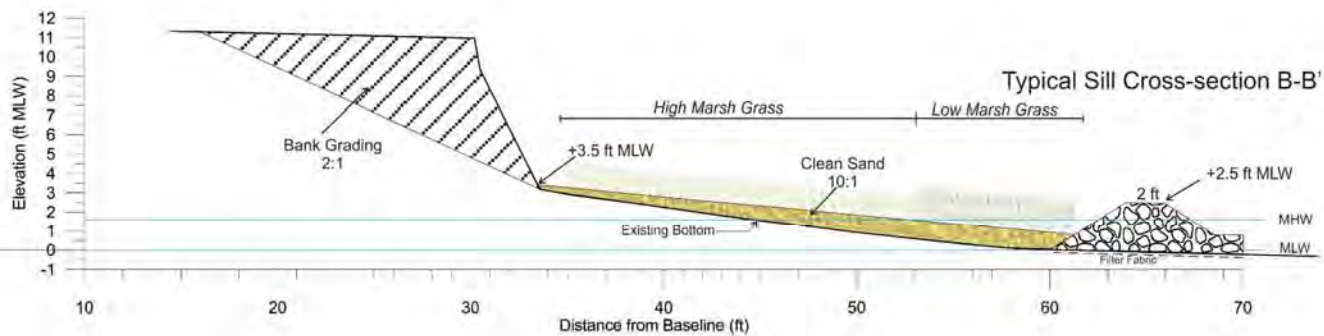
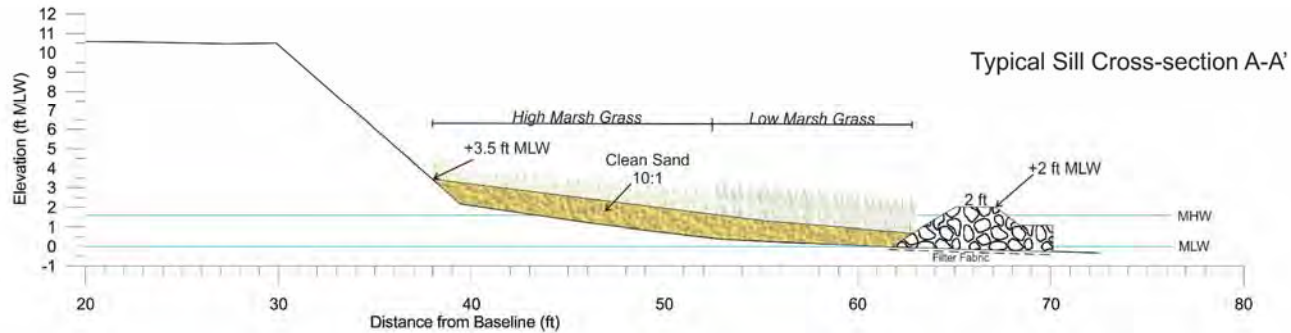


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The plan consists of six rock sills with planted marsh, oyster bag sills, and bank grading. Sills are relatively narrow and low since the site has relatively low fetch conditions. Bank grading will correct unsafe conditions and provide recreational access. Construction access to the northwest facing shoreline may be an issue that would have to be worked out by the County with the treatment facility and private landowner.

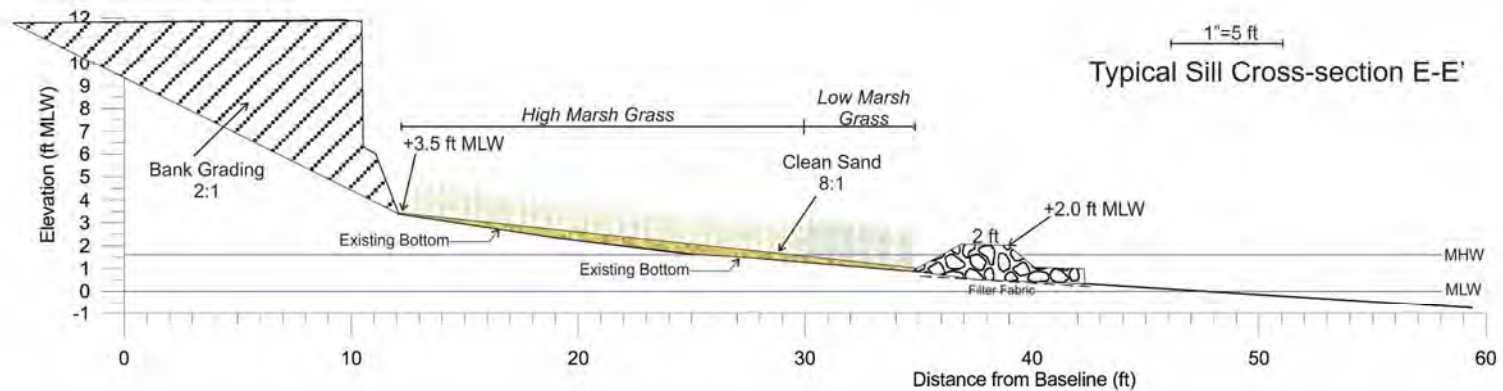
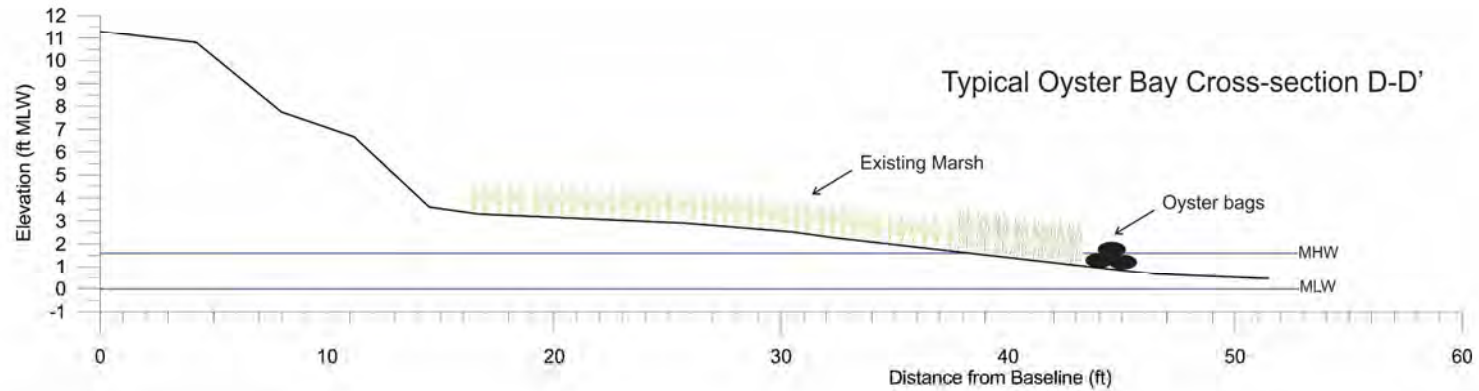


# Typical Cross-Sections



To protect the base of bank near the marina channel, a low, narrow sill with sand fill is designed for the southwest facing shoreline. Moving toward the point, the structures become taller to deal with additional fetch. Because the steep eroding bank is a hazardous condition, the shoreline is graded. At Robin Grove Point, the concrete debris will be removed, and clean sand will be placed in a gap between the structures. The bank will be graded on a 3:1 slope to provide easier access to the beach for people with their pets and a kayak/canoe launch area.

# Typical Cross-Sections



The marsh on the northwest facing shoreline is stable. However, to maintain it, oyster bag sills will be placed along its edge. The heavily wooded shoreline is not easily accessible for people to use and has fallen trees and exposed roots that make it unsafe. A low rock sill with sand fill will establish a marsh for shore protection and the bank will be graded. Construction access may be an issue for this section of shoreline.