

Day 3 Overview - 9:30-4pm

- Arrival and Check in 9:15am (Ryan Resilience Lab)
- Plan for the Day, ERP Staff welcome & orientation
- Practical Monitoring Protocol and ShoreWatch Demo
- Materials and Survey Tools Demo
- Lunch and meet outside for demo stations
- Demo Stations in small groups (Plants, Tools, Maintenance Inspections)
- 15 minute break
- Best Practices for Permit Drawings
- Concept Drawing Activity
- Introduce Assignment Drawings/Design/JPA Assignment

Instructors/Speakers

- Karen Duhring, VIMS
- Sean Gregory, VIMS
- Christine Tombleson, VIMS
- Aaron Wendt, DCR SEAS
- Samantha Miller, ERP
- Jim Cahoon, Bay Environmental
- Ryan Walsh, JRA
- Ellen Grimes, CRM

CBLP Staff

- Shereen Hughes
- Stacie McGraw
- Gabi Kinney



Common Knowledge of Living Shoreline Implementation Best Practices & Resources

Site Feasibility & Evaluation

Design

Permitting

Construction

Maintenance Monitoring Management

Meet Client & ID Problem

Site Assessment

Consult Technical Advisors & Regulators

Consider Solutions

Select Solution

Conceptual Designs

Consult Client, Contractor

Consult Regulators, TAs

ID Impacts & Permits Required

Develop final drawings for

Permit Application

Complete & Submit JPA

Part 5 CBPA Info

Site Visits & Meetings w/ Regulators & Boards

Address Comments & Conditions for Approval

Pre-Construction Feasibility, Site Visits, Consults, Permits

Site Prep, Protection Materials

Construction & Inspections

Establishment

Typical Regular Tasks

Management

Monitoring & Verification



Your Turn - Sketch Plan View & Cross Sections



No.	Revision/Issue	Date

File Name and Address

Project Name and Address
NORFOLK CHRISTIAN SCHOOL
 235 THOLE STREET,
 NORFOLK, VA, USA

Project	Sheet
Date	A-2
Scale	1" = 30'

Design Considerations

- What level of protection is needed and how does the design meet that need?
- How have you incorporated planning for future conditions into the design?
- What other approaches were considered?

Homework Due July 25 @ 5 PM

Finalize Design

Prepare Drawings - Plan View and 1 or more Cross Sections

Complete JPA for Site

Save to PDF and email to stacie@cblpro.org

To earn certificate - work on a living shoreline installation project

Homework: Finalize Design, Prepare Drawings and Complete JPA for Site

- Using what you have learned throughout the workshop, refine the concept drawing begun in class and develop permit drawings for a living shoreline appropriate for the site discussed in class. Submit a pdf of the drawings to stacie@cblpro.org by **5pm on July 25**.
- Complete a Joint Permit Application for the site design you develop. Submit along with the drawings at **5 pm on July 25**
- Answer the following questions pertaining to your design:
 - How will your shoreline adapt to the intermediate high rate of sea level rise?
 - What is the expected life of your project?

Additional resources for drawings: [Sample Drawings](#), [Site map 1](#), [Site map 3](#), [Site map 4](#), [Site map 6](#), [Bank Zones](#), and [Survey legend](#).

Part 4 - Project Drawings

Plan view and cross-sectional view drawings are required for all projects. Application drawings do not need to be prepared by a professional draftsman, but they must be clear, accurate, and should be to an appropriate scale. If a scale is not used, all dimensions must be clearly depicted in the drawings. If available, a plat of the property should be included, with the existing and proposed structures clearly indicated. **Distances from the proposed structure(s) to fixed points of reference (benchmarks) and to the adjacent property lines must be shown.** A vicinity map (County road map, USGS Topographic map, etc.) must also be provided to show the location of the property. **NOTE:** The sample drawings have been included at the end of this section to provide guidance on the information required for different types of projects. Clear and accurate drawings are essential for project review and compliance determination. Incomplete or unclear drawings may cause delays in the processing of your application.

The following items must be included on ALL project drawings: (plan and cross-sectional, as appropriate)

- **name of project**
- **north arrow**
- **scale**
- **waterway name**
- **existing and proposed structures, labeled as such**
- **dimensions of proposed structures**
- **mean high water and mean low water lines**
- **all delineated wetlands and all surface waters on the site, including the Cowardin classification (i.e., emergent, scrub-shrub, or forested) for those surface waters (if applicable)**
- **limits of proposed impacts to surface waters, such as fill areas, riprap scour protection placement, and dredged areas, and the amount of such impacts in square feet and acres**
- **ebb/flood direction**
- **adjacent property lines and owner's name**
- **distances from proposed structures to fixed points of reference (benchmarks) and adjacent property lines**

A Vicinity Map (County road map, USGS Topo, etc.) must also be provided. *NOTE:...Clear and accurate drawings are essential for project review and compliance determination.*

Filling out the JPA



Your Turn

What is needed for a complete Joint Permit

Part 1 - General Information

- Applicant and Agent's information, including project location
- Description of the project, including cost

Part 2 - Signatures

- Approval letters from adjacent property owners

Part 3 - Appendix B

- Maximum encroachment channelward of mean high water plus square footage
- Areas that will be impacted
- Type of construction and all materials
- Any proposed vegetative stabilization measures to be used

Part 4 - Project Drawings

- Vicinity Map (USGS topographic map, road map or similar showing project location)
- Plan View Drawing (overhead, to scale or with dimensions clearly marked)
- Section View Drawing (side-view, to scale or with dimensions clearly marked)

Part 5 - Chesapeake Bay Preservation Act Information

JPA Guided Resource: Shoreline Management Handbook

Center for Coastal Resources Management

Home / ... / Shoreline Management Handbook / Permit Information

Permit Information

What are the permit types, applications, and required information?

Permits Types

There are two categories of permits used to review and authorize activities in Virginia's tidal wetlands, beach and dunes, and/or subaqueous lands. Certain activities that are anticipated to have minor adverse impacts can qualify for one of three general permits issued by the Virginia Marine Resource Commission. The general permits expedite the review process and do not require a public hearing. Activities that do not qualify for a general permit are reviewed as an individual permit. In either case, one permit application is used by all regulatory and advisory agencies.

Individual Permits

Each applicable regulatory agency conducts an independent review and issues a permit for their jurisdiction. The table shows which agencies have permit authority for tidal shorelines in Virginia. See **Conduct a Hearing** for a description of the permit review and approval process.

General Permits

VMRC has several general permits for activities along the shoreline and on submerged lands.

The most relevant of these permits for Wetland Boards are:

Legislation	Administrative Process	Allow Right	Comments and Definitions
Tidal Wetlands Act	Local Wetlands Board VMRC Final Board	VMRC	Local Wetlands Board 1. 2000-2001 VMRC Final Board 2. 2002-2003 VMRC Final Board 3. 2004-2005 VMRC Final Board 4. 2006-2007 VMRC Final Board 5. 2008-2009 VMRC Final Board 6. 2010-2011 VMRC Final Board 7. 2012-2013 VMRC Final Board 8. 2014-2015 VMRC Final Board 9. 2016-2017 VMRC Final Board 10. 2018-2019 VMRC Final Board 11. 2020-2021 VMRC Final Board 12. 2022-2023 VMRC Final Board 13. 2024-2025 VMRC Final Board
Coastal Primary Sand Dunes & Beaches Act	Local Wetlands Board VMRC Final Board	VMRC	Local Wetlands Board 1. 2000-2001 VMRC Final Board 2. 2002-2003 VMRC Final Board 3. 2004-2005 VMRC Final Board 4. 2006-2007 VMRC Final Board 5. 2008-2009 VMRC Final Board 6. 2010-2011 VMRC Final Board 7. 2012-2013 VMRC Final Board 8. 2014-2015 VMRC Final Board 9. 2016-2017 VMRC Final Board 10. 2018-2019 VMRC Final Board 11. 2020-2021 VMRC Final Board 12. 2022-2023 VMRC Final Board 13. 2024-2025 VMRC Final Board
Chesapeake Bay Preservation Act	Local Wetlands Board "Dry" Board or Staff	DD	Local Wetlands Board 1. 2000-2001 VMRC Final Board 2. 2002-2003 VMRC Final Board 3. 2004-2005 VMRC Final Board 4. 2006-2007 VMRC Final Board 5. 2008-2009 VMRC Final Board 6. 2010-2011 VMRC Final Board 7. 2012-2013 VMRC Final Board 8. 2014-2015 VMRC Final Board 9. 2016-2017 VMRC Final Board 10. 2018-2019 VMRC Final Board 11. 2020-2021 VMRC Final Board 12. 2022-2023 VMRC Final Board 13. 2024-2025 VMRC Final Board
Subaqueous Lands	VMRC	VMRC	Local Wetlands Board 1. 2000-2001 VMRC Final Board 2. 2002-2003 VMRC Final Board 3. 2004-2005 VMRC Final Board 4. 2006-2007 VMRC Final Board 5. 2008-2009 VMRC Final Board 6. 2010-2011 VMRC Final Board 7. 2012-2013 VMRC Final Board 8. 2014-2015 VMRC Final Board 9. 2016-2017 VMRC Final Board 10. 2018-2019 VMRC Final Board 11. 2020-2021 VMRC Final Board 12. 2022-2023 VMRC Final Board 13. 2024-2025 VMRC Final Board
Virginia Water Pollution Permit	DD	County	Local Wetlands Board 1. 2000-2001 VMRC Final Board 2. 2002-2003 VMRC Final Board 3. 2004-2005 VMRC Final Board 4. 2006-2007 VMRC Final Board 5. 2008-2009 VMRC Final Board 6. 2010-2011 VMRC Final Board 7. 2012-2013 VMRC Final Board 8. 2014-2015 VMRC Final Board 9. 2016-2017 VMRC Final Board 10. 2018-2019 VMRC Final Board 11. 2020-2021 VMRC Final Board 12. 2022-2023 VMRC Final Board 13. 2024-2025 VMRC Final Board
Clear Water Act	Coast of Engineers	EM and County	Local Wetlands Board 1. 2000-2001 VMRC Final Board 2. 2002-2003 VMRC Final Board 3. 2004-2005 VMRC Final Board 4. 2006-2007 VMRC Final Board 5. 2008-2009 VMRC Final Board 6. 2010-2011 VMRC Final Board 7. 2012-2013 VMRC Final Board 8. 2014-2015 VMRC Final Board 9. 2016-2017 VMRC Final Board 10. 2018-2019 VMRC Final Board 11. 2020-2021 VMRC Final Board 12. 2022-2023 VMRC Final Board 13. 2024-2025 VMRC Final Board

Jurisdiction Table - click to enlarge

JPA Required Information

The Tidewater JPA (the most commonly used JPA for tidal shoreline projects) is comprised of five parts. Applications are determined complete by the permitting authority. In order to be complete, the application must at a minimum include the following:

Part 1 - General Information

Information listed as required in the Tidal Wetlands Act (Wetlands Zoning Ordinance)

- ▶ Applicant
- ▶ Proposed Activity
- ▶ Plan View Map & Cross Section Views
- ▶ Equipment and Access
- ▶ Adjacent Owners
- ▶ Cost
- ▶ Project Purpose
- ▶ Public Benefit
- ▶ Mitigation
- ▶ Expected Timeline
- ▶ Suggested Information
- ▶ Additional Information

Part 2 - Signatures

Part 3 - Appendices

Submit the appendices that are as applicable to your project:

- A - Projects for Access (piers, etc)
- B - Shoreline Stabilization (most commonly used for shoreline erosion control projects)
- C - Crossings
- D - Aquaculture Related Structures

Part 4 - Project Drawings

Part 5 - Chesapeake Bay Preservation Act Information

All proposed activities related to the Tidewater JPA must comply with the Chesapeake Bay Preservation Area and Designation Management Regulations and requires the submission of a Water Quality Impact Assessment (WQIA).

A WQIA is an application that requests information to identify the impacts of proposed activities on water quality and lands in Resource Protection Areas (RPAs).

Part 1, 4. Provide a detailed description...example

The applicant proposes to install a 40 linear foot living shoreline with a 40 linear foot return on property at the East Ocean View Community Center. A previous phase of living shoreline at this facility has been highly successful and is publicly accessible. The project includes a total of 60 linear feet of oyster castles stacked 3 blocks high (40 foot along the MLW line and a 20 foot return to tie the project back into the eroding bank) and approximately 315 square feet of sand fill with a total planting area of 915 square feet. 20 feet of 12" coir log will be used along the sand fill for toe protection. The project will impact 540 square feet of tidal wetlands (315 SF sand fill, 225 SF oyster castle). Elevations are currently appropriate for low marsh planting, however, the upper marsh bank is eroding. The sand fill is intended to provide a gently sloping tie in to the bank while also providing additional low and high marsh planting zones. The oyster castles will abate wave energy to protect the plantings while also providing habitat for oyster spat set.

Part 1, 8. & 10 examples

8. What are the *primary and secondary purposes of and the need for* the project? For example, the primary purpose may be “to protect property from erosion due to boat wakes” and the secondary purpose may be “to provide safer access to a pier.”

Primary purpose is to restore and abate shoreline erosion. Secondary purpose is to create a living shoreline with oyster habitat that is publicly accessible for educational purposes.

10. Describe alternatives considered and the measures that will be taken to avoid and minimize impacts, to the maximum extent practicable, to wetlands, surface waters, submerged lands, and buffer areas associated with any disturbance (clearing, grading, excavating) during and after project construction. *Please be advised that unavoidable losses of tidal wetlands and/or aquatic resources may require compensatory mitigation.*

a riprap revetment would stem the shoreline erosion but would not be the ecologically preferred method.

The JPA - Part 3. Appendix B

Everything We Need to Know

- It is imperative that we receive a complete application with a clear and concise description and diagrams, purpose and need, and properly filled out appendices
- A JPA without one of the aforementioned sections would require additional information from the applicant and would increase the review time
- Not all agencies require the same information in order to complete their review and sometimes it is necessary to request additional information

Appendix B: Projects for Shoreline Stabilization in tidal wetlands, tidal waters and dunes/beaches including riprap revetments and associated backfill, marsh toe stabilization, bulkheads and associated backfill, breakwaters, beach nourishment, groins, jetties, and living shoreline projects. Answer all questions that apply. Please provide any reports provided from the Shoreline Erosion Advisory Service or VIMS.

NOTE: It is the policy of the Commonwealth that living shorelines are the preferred alternative for stabilizing tidal shorelines (Va. Code § 28.2-104.1). **Information on non-structural, vegetative alternatives (i.e., Living Shoreline) for shoreline stabilization is available at http://ccrm.vims.edu/coastal_zone/living_shorelines/index.html.**

1. Describe each **revetment, bulkhead, marsh toe, breakwater, groin, jetty, other structure, or living shoreline project** separately in the space below. Include the overall length in linear feet, the amount of impacts in acres, and volume of associated backfill below mean high water and/or ordinary high water in cubic yards, as applicable:

Describe the activity, materials used, fill AND SF of restoration area

2. What is the maximum encroachment channelward of mean high water? _____ feet.
Channelward of mean low water? _____ feet.
Channelward of the back edge of the dune or beach? _____ feet.
3. Please calculate the square footage of encroachment over:
 - Vegetated wetlands _____ square feet
 - Non-vegetated wetlands _____ square feet
 - Subaqueous bottom _____ square feet
 - Dune and/or beach _____ square feet

Direct impacts caused by the project, DO NOT list the creation of wetlands

Your Turn: Filling Out a JPA: Estimating Volume

Use Your Plan to Fill Out a JPA for this Living Shoreline Project

Describe the activity, materials used, fill AND Square Feet of restoration area

Amount of fill/sand - can use volume of a trapezoidal prism to calculate

volume of trapezoidal prism = ((short base length + long base length) / 2) × height × length

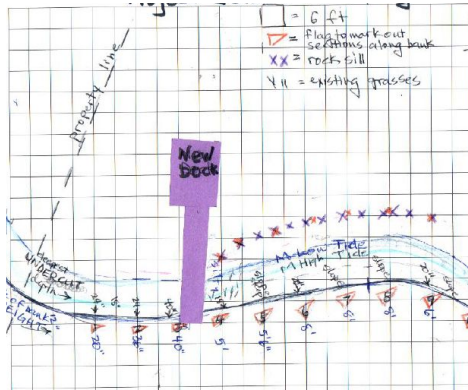
volume of triangular prism = 0.5 * b * h * length, where b is the length of the base of the triangle, h is the height of the triangle, and length is prism length

Part 4. Project Drawings

Why words and diagrams matter

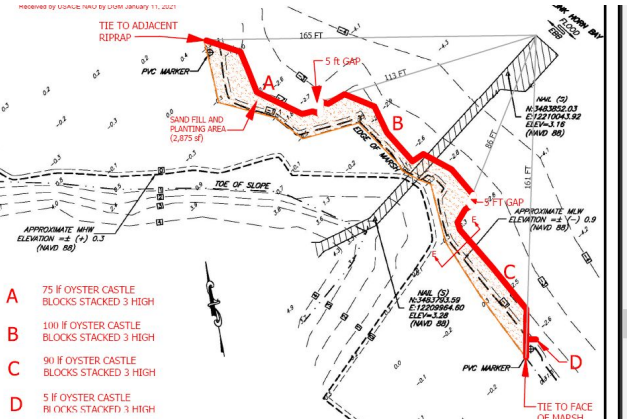
4. Provide a detailed description of the project in the space below, including the type of project, its dimensions, materials, and method of construction. Be sure to include how the construction site will be accessed and whether tree clearing and/or grading will be required, including the total acreage. If the project requires pilings, please be sure to include the total number, type (e.g. wood, steel, etc), diameter, and method of installation (e.g. hammer, vibratory, jetted, etc). If additional space is needed, provide a separate sheet of paper with the project description.

Living Shoreline project with sill, sand replenishment, stone revetment, Planting of Spartina alterniflora and patens.



4. Provide a detailed description of the project in the space below, including the type of project, its dimensions, materials, and method of construction. Be sure to include how the construction site will be accessed and whether tree clearing and/or grading will be required, including the total acreage. If the project requires pilings, please be sure to include the total number, type (e.g. wood, steel, etc), diameter, and method of installation (e.g. hammer, vibratory, jetted, etc). If additional space is needed, provide a separate sheet of paper with the project description.

The purpose of the project is to create a living shoreline in front of existing, eroding marsh. The existing shoreline experiences erosion primarily from boat wake due to extremely shallow off shore conditions, but also from minor (0.37 mile) fetch. The proposed living shoreline consists of 270 linear feet of oyster castle blocks stacked three blocks high underlain with filter fabric with 2,875 square feet of sand backfill landward of the blocks to prepare a planting area for Spartina alterniflora. The Spartina will be planted on 18 inch centers and the entire planting area will be encircled and protected with goose predation protection fencing. Oyster castle blocks will be hand placed on the fabric, then sand will be placed from equipment on a barge. Final grading will be done by hand to ensure that the existing marsh grade is matched.



Part 3. Appendix B: Projects for Shoreline Stabilization

1. Describe each **revetment, bulkhead, marsh toe, breakwater, groin, jetty, other structure, or living shoreline project** separately in the space below. Include the overall length in linear feet, the amount of impacts in acres, and volume of associated backfill below mean high water and/or ordinary high water in cubic yards, as applicable:

The project includes 60 linear feet of oyster castles stacked three blocks high and 20 linear feet of 12" coir log with 315 square feet (approximately 12 cubic yards) of clean medium fine sand fill. Low marsh to be planted with *Spartina alterniflora* on 18 inch centers up to elevation of MHW, and high marsh to be planted with *Spartina patens* on 18 inch centers from MHW up to upper limits of tidal wetlands at tie in with bank. *Hibiscus moscheutos* quarts will be planted on approximate 5 foot centers within the high marsh zone above MHW. Goose protection fencing to be installed around entire planting area.

Part 3. Appendix B: Projects for Shoreline Stabilization

2. What is the maximum encroachment channelward of mean high water? 24 feet.
Channelward of mean low water? 0 feet.
Channelward of the back edge of the dune or beach? n/a feet.
3. Please calculate the square footage of encroachment over:
- Vegetated wetlands 0 square feet
 - Non-vegetated wetlands 540 square feet
 - Subaqueous bottom 0 square feet
 - Dune and/or beach n/a square feet

Direct impacts caused by the project,
DO NOT list the creation of wetlands

Part 3. Appendix B: Projects for Shoreline Stabilization

- Describe the type of construction and **all** materials to be used, including source of backfill material, if applicable (e.g., vinyl sheet-pile bulkhead, timber stringers and butt piles, 100% sand backfill from upland source; broken concrete core material with Class II quarry stone armor over filter cloth).

NOTE: Drawings must include construction details, including dimensions, design and all materials, including fittings if used.

commercially manufactured oyster castle placed on geotechnical fabric

12" diameter premium density coir log

clean medium fine sand with less than 10% fines

Part 3. Appendix B: Projects for Shoreline Stabilization

6. If using stone, broken concrete, etc. for your structure(s), what is the average weight of the:
- | | | | |
|------------------------------|-----|------------------------|------------------|
| Core (inner layer) material | n/a | _____ pounds per stone | Class size _____ |
| Armor (outer layer) material | n/a | _____ pounds per stone | Class size _____ |
7. For **beach nourishment**, including that associated with breakwaters, groins or other structures, provide the following:
- Volume of material

0	_____ cubic yards channelward of mean low water
12	_____ cubic yards landward of mean low water
6	_____ cubic yards channelward of mean high water
6	_____ cubic yards landward of mean high water
 - Area to be covered

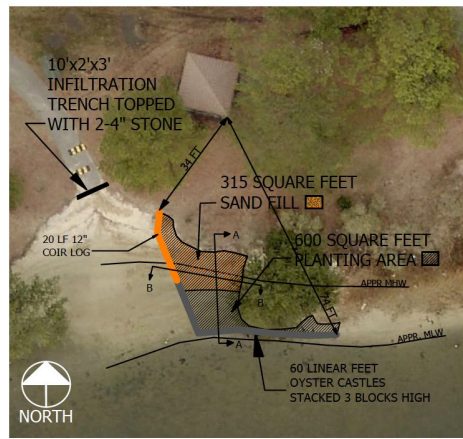
0	_____ square feet channelward of mean low water
315	_____ square feet landward of mean low water
115	_____ square feet channelward of mean high water
200	_____ square feet landward of mean high water

Part 3. Appendix B: Projects for Shoreline Stabilization

- Source of material, composition (e.g. 90% sand, 10% clay): 100% sand
- Method of transportation and placement:
skid steere to top of bank, then hand graded
- Describe any proposed vegetative stabilization measures to be used, including planting schedule, spacing, monitoring, etc. Additional guidance is available at <http://www.vims.edu/about/search/index.php?q=planting+guidelines>:

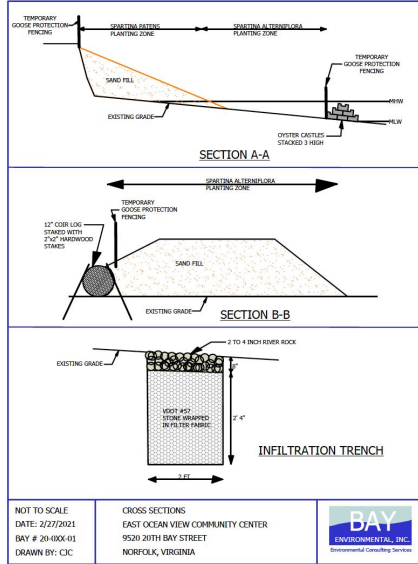
Low marsh to be planted with *Spartina alterniflora* on 18 inch centers up to elevation of MHW, and high marsh to be planted with *Spartina patens* on 18 inch centers from MHW up to upper limits of tidal wetlands at tie in with bank. *Hibiscus moscheutos* quarts will be planted on approximate 5 foot centers within the high marsh zone above MHW. Goose protection fencing to be installed around entire planting area.

Part 4. Project Drawings and Descriptions example



EXISTING ELEVATIONS ARE APPROPRIATE FOR SPARTINA ALTERNIFLORA AND SPARTINA PATENS PLANTING, SAND FILL INTENDED TO LEVEL OUT EXISTING EROSION SCARP, OYSTER CASTLES WILL ABATE WAVE ENERGY TO ESTABLISH PLANTINGS.

INFILTRATION TRENCH IS INTENDED SOLELY TO SLOW VELOCITY OF STORMWATER COMING OFF OF PAVED KAYAK LAUNCH PATH.



NOT TO SCALE
DATE: 2/27/2021
BAY # 20-000-01
DRAWN BY: CJC

CROSS SECTIONS
EAST OCEAN VIEW COMMUNITY CENTER
9520 20TH BAY STREET
NORFOLK, VIRGINIA



Wetlands - General Conditions

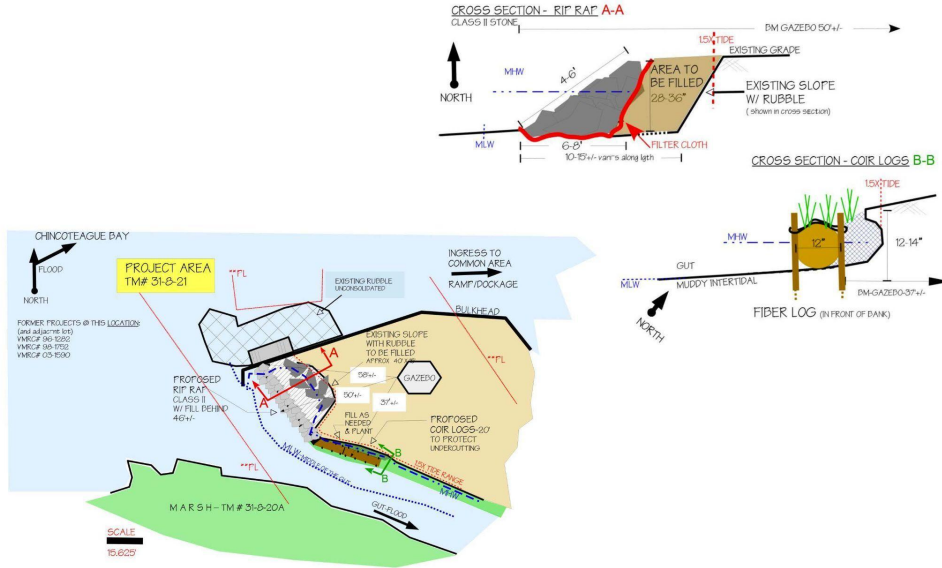
1. There will be a minimum five foot opening in any section of coir log in excess of 100 feet in length.
2. Goose fencing will be installed according to the attached specifications and maintained for two growing seasons unless approved to be removed by Wetlands Board staff.
3. Wetlands grasses will be installed on 12 or 18 -inch centers and fertilized with one ounce of Osmocote 18-6-12 slow release fertilizer or equivalent.
4. Plant mortality will be addressed by replacing plants during the next available growing season.
5. Wetland planting will achieve an 85% coverage within two full growing seasons to be considered successful.
6. Sand fill (for living shoreline projects) will meet the following standard: Using the Unified Soil Classification System, sand will be SM (silty sands), SP or SW with a medium grain size of around 0.25 mm with no more than 20 percent passing through a #100 sieve (0.149mm) and no more than 10 percent passing through a #200 sieve (0.074mm). (Norfolk staff strongly recommends Vulcan White Sand #31152)

Part 4. Styles vary Legibility & Details



Living Shoreline JPA Plan & Cross Section Examples

Day 1: Design Options/Small Group Discussion

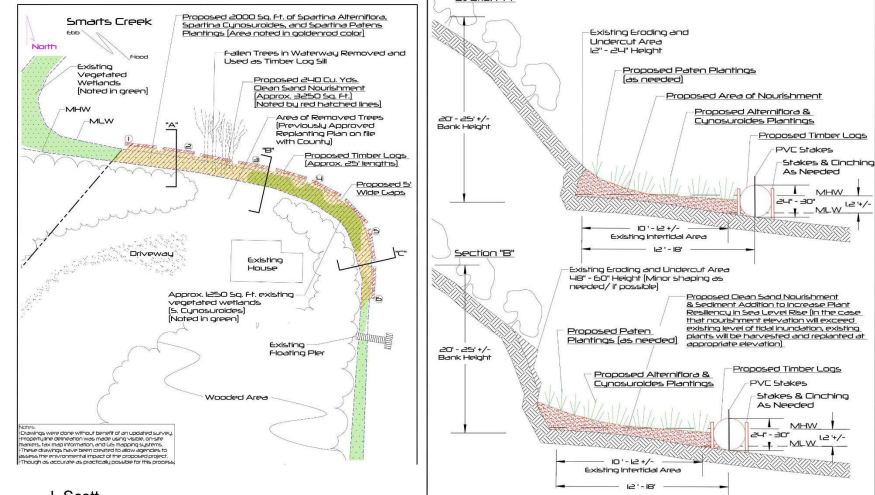


CRM, INC



Living Shoreline JPA Plan & Cross Section Examples

Day 1: Design Options/Small Group Discussion



J. Scott

Part 5. Chesapeake Bay Preservation Act Information

Notes for shoreline erosion control projects in RPAs *Re-establishment of woody vegetation in the buffer will be required by the locality to mitigate for the removal or disturbance of buffer vegetation associated with your proposed project. Please contact the local government to determine the mitigation requirements for impacts to the 100-foot RPA buffer.*

Shoreline erosion projects are a permitted modification to RPAs provided that the project is based on the “best technical advice” and complies with applicable permit conditions. *In accordance with 9VAC25-830-140 1 of the Virginia Administrative Code, the locality will use the information provided in this Part V, in the project drawings, in this permit application, and as required by the locality, to make a determination*

Access to the project will be provided with the minimum disturbance necessary.

Permitting Discussion

