Marsh Sills/Living Shorelines

Definition/Purpose

Marsh Sills protect estuarine shorelines from erosion, combining engineered structures with natural vegetation to maintain, restore, or enhance the shoreline's natural habitats. A sill is a coast-parallel, long or short structure built with the objective of reducing the wave action on the shoreline by forcing wave breaking over the sill. Sills are used to provide protection for existing coastal marshes, or to retain sandy fill between the sill and the eroding shoreline, to establish suitable elevations for the restoration or establishment of coastal marsh and/or riparian vegetation.

Policies

1. This practice should only be installed in areas with eroding shorelines or in areas where marsh vegetation alone is not sufficient to stabilize the shoreline.

2. Sills shall always be combined with suitable wetland plantings or installed for the protection of existing coastal marsh and/or riparian vegetation.

3. Sills may be constructed from a variety of materials including, but not limited to granite, marine limestone (marl), concrete, wood, timber, vinyl, steel or bagged oyster shells.

4. A General or Major CAMA Permit (if site conditions do not allow for approval by a General Permit) for a riprap/stone sill or a sheetpile sill must be obtained from the Division of Coastal Management (see References below).

5. Applicants must comply with all applicable state and federal permits for the construction of this BMP, including consent from adjacent riparian property owners, coordination with applicable agencies and specific design conditions.

6. <u>Specific conditions applicable to both riprap/stone sills and sheetpile sills</u>:
   In accordance with the standards in 15A NCAC 07H Section .2700 and/or Section .2100, design conditions that are applicable to this sill BMP include (but are not limited to):
   a. Sill construction shall be limited to a maximum length of 500 feet.

   b. The height of sills shall not exceed six inches above normal high water or the normal water level, or the height of the adjacent wetland substrate, whichever is greater.

   c. The sill shall have at least one five-foot opening, dropdown, or overlap at every 100 feet. Deviation from these drop-down requirements shall be allowable through coordination with NC Division of Marine Fisheries and the National Marine Fisheries Service.

   d. For water bodies more narrow than 150 feet, the structures shall not be positioned offshore more than one sixth (1/6) the width of the waterbody.

7. Specific conditions applicable to a riprap stone sill:
   In accordance with the standards in 15A NCAC 07H Section .2700, sill structures shall be constructed from riprap materials. Section .2700 design conditions that are applicable to this riprap sill BMP include (but are not limited to):

   a. On shorelines where no fill is proposed, the landward edge of the sill shall be positioned no more than 5 feet waterward of the waterward depth contour of locally growing wetlands or to mid-tide depth contour, whichever is greater.

   b. On shorelines where fill is proposed, the landward edge of the sill shall be positioned no more than 30 feet waterward of the existing mean high water or normal high water line.

   c. The riprap structure shall not exceed a minimum slope of 2 horizontal: 1 vertical and a maximum slope of 1.5 horizontal: 1 vertical. The bottom width of the structure shall be no wider than 15 feet.

   d. For the purpose of protection of public trust rights, fill waterward of the existing mean high water line shall not be placed higher than the mean high water elevation.

   e. The sill shall not be within a navigation channel marked or maintained by a state or federal agency.

   f. The sill shall not interfere with leases or franchises for shellfish culture.

   g. All structures shall have a minimum setback distance of 15 feet between any parts of the structure and the adjacent property owner's riparian access corridor, unless either a signed waiver statement is obtained from the adjacent property owner or the portion of the structure within 15 feet of the adjacent riparian corridor is located no more than 25 feet from the mean high or normal high water level.

8. Specific conditions applicable to a sheetpile sill:
   In accordance with the standards in 15A NCAC 07H Section .2100, sill structures shall be constructed from timber, vinyl, or steel sheetpile. Section .2100 design conditions that are applicable to this sheetpile sill BMP include (but are not limited to):

   a. The sill shall be positioned no more than 20 feet waterward of the normal high water or normal water level or 20 feet waterward of the waterward edge of existing wetlands at any point along its alignment.

   b. Sills authorized under this General Permit shall be allowed only in waters that average less than three feet in depth along the proposed alignment as measured from the normal high water or normal water level.

   c. The sill shall be constructed with an equal gap between each sheathing board totaling at least one inch of open area every linear foot of sill.

MARSH SILLS	
Lifespan	5 years single-family home, 10 years all other properties
BMP Units	LINEAR FEET
Required Effects	Soil loss reductions (volumetric calculation), if applicable and measurable
JAA	CAMA permit serves as the job approval authority
CS2/Reference Materials	• NC-ACSP-11 Signature Page • Map with BMP location and fields

Specifications

SECTION .2700 – GENERAL PERMIT FOR THE CONSTRUCTION OF RIPRAP SILLS FOR WETLAND ENHANCEMENT IN ESTUARINE AND PUBLIC TRUST WATERS
15A NCAC 07H .2700

SECTION .2100 - GENERAL PERMIT FOR CONSTRUCTION OF SHEETPILE SILL FOR SHORELINE PROTECTION IN ESTUARINE AND PUBLIC TRUST WATERS AND OCEAN HAZARD AREAS
15A NCAC 07H .2100

Additional resources;
https://deq.nc.gov/about/divisions/coastal-management/coastal-management-estuarine-shorelines/stabilization/stabilization-options - shoreline stabilization options

https://www.livingshorelinesacademy.org/ - Living Shoreline Academy with an online course on the design of living shorelines, project information, and other resources