
Fiber coir rolls are installed with jute rope and staggered stakes along the shore of Island Pond in Brighton, VT.

## 5.2 Fiber Coir Rolls

### Description

A fiber coir roll is a log made of coconut fiber, straw, or other biodegradable fibers woven into a cylindrical tube. The rolls are typically 10 feet in length and 12”-16” in diameter. They are encased in netting of jute, hemp, or burlap. Note: it is important not to use fiber coir rolls sold with synthetic, nylon netting because this netting can endanger wildlife.

### Purpose

To reduce erosive stormwater velocity along slopes, capture sediment, provide a bench for planting, and/or to re-establish or strengthen the toe at the base of the shoreline. Occasionally, fiber coir rolls are used to create a temporary breakwater as well.

### Conditions Where Practice Applies

Fiber coir rolls are well suited for low to moderate energy sites where slope and toe stabilization is required in conjunction with other restoration practices including slope regrading, live staking, and other plantings.

### Tips and Considerations

If used for a toe, fiber coir rolls should be placed just above the shoreline, where the bank meets the water. They should not be submersed as they could become dislodged and float away. Fiber coir rolls are generally not suitable as toe protection for high energy sites with significant wave action and ice push. For these high energy areas, they are best placed above a rock toe foundation or further up the bank to prevent soil slippage by slowing upland stormwater.

Live stakes or herbaceous plugs can be planted directly in the fiber rolls, but this is not recommended as the fiber coir rolls tend to dry out and plants would need regular watering.

### Plans and Specifications

Slopes should be prepared following guidance from the Slope Regrading and Vegetated Buffer practice descriptions. Create a soil cradle along the toe or slope, on the contour, where a fiber roll will be installed. Prepare seed bed and install erosion control blankets if needed. Place and stake fiber coir roll in soil cradle and affix with manila or jute rope. The three-foot tall one-inch width stakes should be set, staggered, every two feet. After pounding them to be as level as possible with the top of the fiber coir roll, notch the outside of the stakes to bind them more easily with the rope. If stakes cannot be installed deeply enough to be flush with the coir rolls, the excess stake should be cut off at the height of the fiber coir roll. If stakes are left sticking above the coir rolls, ice or waves could loosen them. For added erosion resistance, place and slope stone aggregate along the lakeshore edge of toe fiber roll from top of the roll to existing grade.

When possible, wetland plants should be planted in front of a fiber coir roll toe for added support. Live stakes can also be used, especially for where stone aggregate has been added in front of the coir log.

## Maintenance Considerations

During vegetative establishment, inspect after storm events and after snowmelt for undermining or unfastening of the fiber roll or underlying erosion blankets from runoff, wind, animals, or ice and snow. As needed, install additional topsoil, regrade site, add seed, and refasten the fiber rolls and erosion control blankets (if applicable). Continue to inspect the fiber coir roll and erosion control blanket until full vegetation establishment (approximately three years).

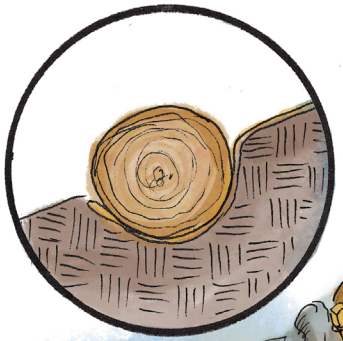
Note: Temporary fencing and signage is highly recommended to protect the site during the first three years of plant establishment. Fiber coir rolls should not be walked on, although they look stable and supportive. Treading on top of them will disturb and weaken them.

## Design Criteria

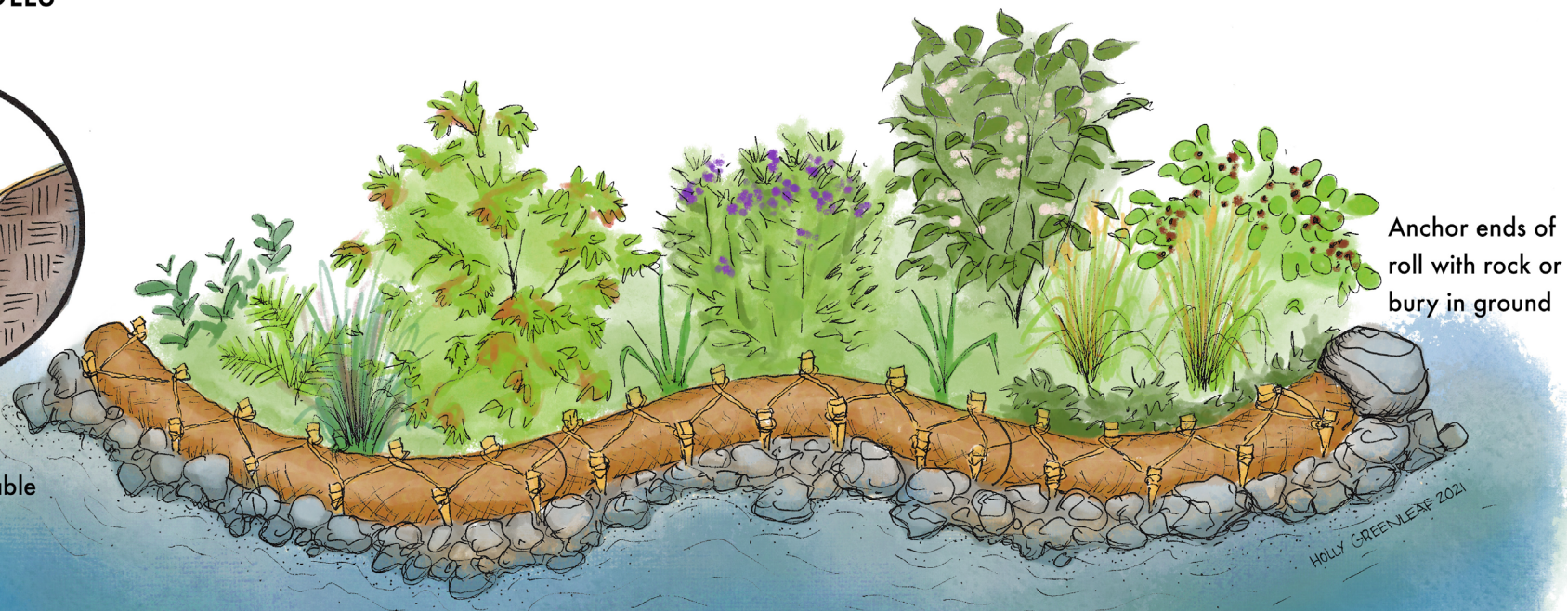
Fiber coir rolls were installed along Lake Salem in Orleans County, VT to provide a bench for native plantings and to strengthen the toe at the base of the shoreline.

| Dimension | Name | Typical Unit | Guidelines | Description |
|---|---|---|---|---|
| **A** | Regraded Slope Pitch | Foot:Foot, Percent (%) | >3:1 slopes although can be utilized at lower slopes. Maximum slope of 2:1 (50%). | Ratio of horizontal run to elevation rise of buffer as measured from the top of bank adjacent to the lakeshore to developed lands (managed turf or impervious area). |
| **B** | Spacing on Slope gradient | Foot | <3:1 slopes – 15 feet, 3:1-2:1 – 10 feet, >2:1 – 5 feet. | Maximum slope length for fiber rolls used as slope interruption. Generalized rages and site-specific considerations will apply. |
| **C** | Fiber Roll Diameter | Inches | 12 inch diameter most typical. | Diameter of the woven cylindrical tube. |

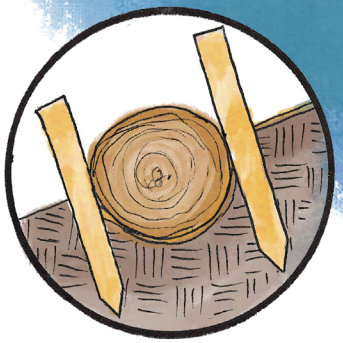
# FIBER COIR ROLLS



Lay roll in 6" deep trench, lay ECB in trench first if applicable

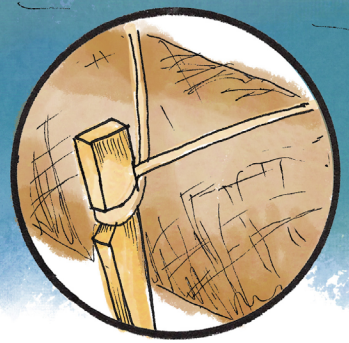



Anchor ends of roll with rock or bury in ground

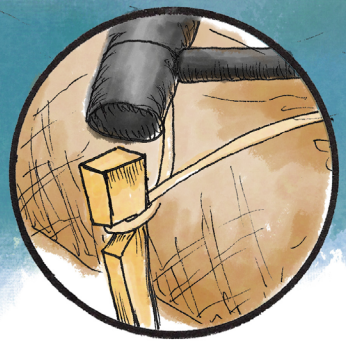


Pound stakes on either side of roll perpendicular to ground level every couple feet

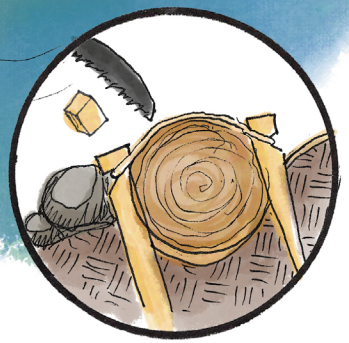
Notch outer side of stake with reciprocating saw at the level where the stake and roll meet



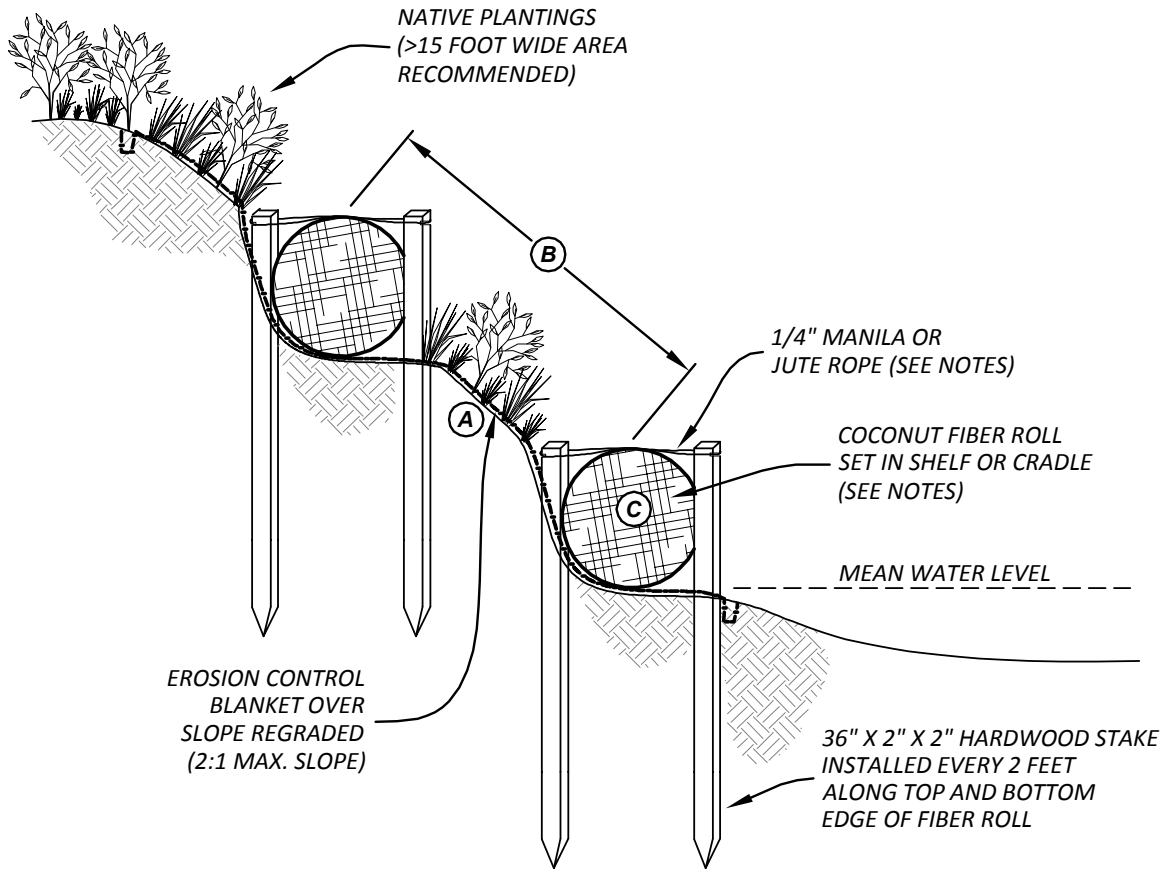
Tie fiber rope in tight zig-zag pattern (jute, coir, manila, sisal fiber)



Pound again to tighten rope



Cut off excess stake to be level with the top of the roll and prevent ice push




*NOTES:*

1. *GRADE SLOPES AS INDICATED BY PLAN.*
2. *CREATE 6" DEPRESSION AT TOE OF STABILIZED/REGRADED SLOPE WITH SHOVEL FOR SETTING COIR LOG.*
3. *PLACE & STAKE EROSION CONTROL BLANKET IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS WITH BOTTOM EDGE BURIED IN SHALLOW TRENCH AND TOP EDGE EXTENDED INTO 5" DEPRESSION.*
4. *PLACE COIR LOG ON TOP OF TOE EDGE OF EROSION CONTROL BLANKET IN DEPRESSION.*
5. *DRIVE HARDWOOD STAKES ON FRONT & BACK SIDES OF COIR LOG 12" FROM EACH END, BOTH ENDS, THEN STAGGERED 12" ON-CENTER FRONT TO BACK FULL LENGTH OF LOG TO A DEPTH WHERE TOP OF STAKE IS SLIGHTLY ABOVE TOP EDGE OF COIR LOG.*
6. *NOTCH STAKES ON OUTSIDE EDGE AND SECURE MANILA OR JUTE ROPE TIGHTLY IN S-PATTERN.*
7. *SECURE ENDS OF LOGS TO ADJACENT LOG WITH ADDITIONAL MANILA OR JUTE ROPE.*
8. *DRIVE STAKES ADDITIONALLY TO CINCH DOWN ROPE SECURELY TO LOG. CUT OFF EXCESS STAKE HEIGHT SO TOP OF STAKE IS FLUSH WITH TOP OF COIR LOG.*
9. *PLACE 3" MINUS ROUNDED STONE ON LAKEWARD EDGE OF COIR LOG IF INDICATED, SLOPED DOWN FROM TOP OF LOG TO EXISTING GRADE.*

***COCONUT FIBER ROLLS (COIR LOGS OR BIOLOGS)***

***LAKEWISE BIOENGINEERING CONSTRUCTION DETAILS***

Plan design: Watershed Consulting Associates, LLC.