

2.11 ROLLED EROSION CONTROL PRODUCTS



Figure 2.25. Backslope protection (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)



Figure 2.26. Foreslope protection in growth stage (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)

Overview

Description: Rolled erosion control products (RECP) consist of prefabricated blankets or netting formed from natural and synthetic materials.

Problem identification: Steep slopes in urban areas require measures to assist in the establishment of vegetation and reduce the opportunity for erosion of the surface.

Design purpose: The RECP materials provide protection to the seed and the underlying soils to reduce the chance of erosion and sediment movement on slopes. RECPs enhance moisture retention to allow for the growth of the seeding applied to the surface. The materials degrade over time and retard unwanted plant growth, reducing maintenance.

Installation: The materials should be installed in conjunction with the manufacturer's recommendations. RECPs may be used in channels or on slopes. General recommendations for installation are found in Table 2.6.

Maintenance/inspection: Damaged areas should be repaired immediately until the vegetation is established and growing through the material.

Design life: Varies with product selection (three to six months).

Estimated cost: Varies with the product selected.



Figure 2.27. Wood excelsior mat (Source: North American Green)

Table 2.6. Typical rolled erosion control product properties and uses* (Source: Lancaster & Austin 2004)

Type	Product description	Material composition	Slope applications Max. grade	Channel applications Permissible shear stress*
Ultra short-term: Typical 3-month functional longevity				
1.A	Mulch control nets	Photodegradable synthetic mesh or woven biodegradable natural fiber netting	5:1 (H:V)	0.25 lbs/ft ²
1.B	Netless rolled erosion control blankets	Natural and/or polymer fibers mechanically interlocked and/or chemically adhered together to form a RECP	4:1 (H:V)	0.5 lbs/ft ²
1.C	Single-net erosion control blankets & open weave textiles	Processed degradable natural and/or polymer fibers mechanically bound together by a single rapidly degrading synthetic or natural fiber netting or an open weave textile of processed rapidly degrading natural or polymer yarns or twines woven into a continuous matrix.	3:1 (H:V)	1.5 lbs/ft ²
1.D	Double-net erosion control blankets	Processed degradable natural and/or polymer fibers mechanically bound together between two rapidly degrading, synthetic, or natural fiber nettings.	2:1 (H:V)	1.75 lbs/ft ²
Short-term: Typical 12-month functional longevity				
2.A	Mulch control nets	Photodegradable synthetic mesh or woven biodegradable natural fiber netting	5:1 (H:V)	0.25 lbs/ft ²
2.B	Netless rolled erosion control blankets	Natural and/or polymer fibers mechanically interlocked and/or chemically adhered together to form a RECP	4:1 (H:V)	0.5 lbs/ft ²
2.C	Single-net erosion control blankets & open weave textiles	Erosion control blanket composed of processed degradable natural or polymer fibers mechanically bound together by a single degradable synthetic or natural fiber netting to form a continuous matrix or an open weave textile composed of processed degradable natural or polymer yarns or twines woven into a continuous matrix.	3:1 (H:V)	1.5 lbs/ft ²
2.D	Double-net erosion control blankets	Processed degradable natural and/or polymer fibers mechanically bound together between two degradable synthetic or natural fiber nettings.	2:1 (H:V)	1.75 lbs/ft ²
Extended-term: Typical 24-month functional longevity				
3.A	Mulch Control Nets	Slow degrading synthetic mesh/woven natural fiber netting	5:1 (H:V)	0.25 lbs/ft ²
3.B	Erosion control blankets & open weave textiles	Erosion control blanket composed of processed slow degrading natural or polymer fibers mechanically bound between two slow degrading synthetic or natural fiber nettings to form a continuous matrix or an open weave textile composed of processed slow degrading natural or polymer yarns or twines woven into a continuous matrix.	1.5:1 (H:V)	2.0 lbs/ft ²
Long-term: Typical 36-month functional longevity				
4	Erosion control blankets & open weave textiles	Erosion control blanket composed of processed slow degrading natural or polymer fibers mechanically bound between two slow degrading synthetic or natural fiber nettings to form a continuous matrix or an open weave textile composed of processed slow degrading natural or polymer yarns or twines woven into a continuous matrix.	1:1 (H:V)	2.25 lbs/ft ²

*Refer to SUDAS Manual, Chapter 7, Section 7E-9 (Turf Reinforcement Mats) for additional information on determining shear stress in a channel. Minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion (0.5 in. soil loss during 30-minute flow event).

Instructions for Wood Excelsior Mat as Slope Protection

The work of providing a suitable earth surface for the placement of slope protection shall be considered crucial to preparing the seedbed. Special care shall be taken to ensure that ground surfaces adjacent to any channels are shaped to facilitate natural drainage into the protected area. Seedbed preparation, seeding, and fertilizing shall be performed in accordance with standard specifications. Prior to the placement of wood excelsior matting, the ground shall be uniformly even with the surface of any adjacent concrete.

Excelsior matting for backslope protection is installed with strips placed perpendicular to the roadway. The location for slope protection shall be performed as shown on the detail plan. The excelsior mat for foreslope protection is installed with strips placed parallel to the roadway.

The wood excelsior mat shall comply with the following minimum requirements:

- The mat shall have interlocking wood fibers with a plastic netting applied to both sides to hold the excelsior in place. The mat shall be non-toxic to the growth of plants and the germination of seeds.
- The mat shall be furnished in rolls as follows:
 - Width of strips, min. 48 in., plus or minus 1 in.
 - Length of rolls, min. 180 ft
 - Minimum weight per sq yd, 0.88 lbs

The netting applied to both sides of the mat shall have a mesh size approximately 5/8 in. to 3/4 in. Netting shall be polypropylene and black in color. The material shall be furnished in plastic bags or otherwise protected to prevent damage from weather conditions and handling.

Directions

1. Space two rows of staples at 18 in. centers, the bottom row at 36 in. centers, and all others staples at 24 in. centers.
2. Where erosive gullies have developed in the backslope, the gullies shall be filled with soil and compacted prior to placement of the mat.
3. There shall be a four feet minimum, an eight feet maximum, or as specified. Place staples the same as is required for special ditch control.
4. Where excelsior mat is to be placed as special ditch control, the slope protection shall be installed to facilitate placement of the ditch control.
5. Foreslope protection shall be four ft, zero in., unless otherwise specified.
6. If an erosive rill has developed adjacent to the shoulder material, it shall be filled with suitable soil and compacted prior to placement of mat.