Catalog of Stormwater Best Management Practices for Idaho Cities and Counties

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Matting BMP 18

Description

Matting is a porous net or fibrous sheet that is laid over the ground surface for slope stabilization and erosion control or to hold mulch in place and protect it against wind or water damage. Matting and netting are sometimes classified as geotextiles (see BMP 17-Geotextile), but in this catalog, matting is considered to be materials made from biodegradable materials including straw, coconut (coir), jute, wood fiber (excelsior), paper, and cotton. Some of these organic materials may be held in place by plastic netting.

Applications

A wide variety of matting materials may be used for erosion control. Most are of two main types: woven, such as jute, and bonded to plastic, such as excelsior. Application examples for these two types are listed below.

Jute matting: Jute matting or netting is available as a heavy fiber net that is generally purchased in rolls and is stapled/anchored to slopes to provide a uniform covering. This covering protects mulches, provides additional water-holding capacity, and aids in moderating environmental fluctuations near the ground surface (as does a mulch).

Jute matting can be applied over straw, grass hay, wood fiber, or manure mulches when wind or water damage would occur without a protective net. Matting is the best single method for protecting the integrity of a mulched area. It may be applied alone as an alternative to straw or wood fiber mulches on flat sites for dust control and seed germination enhancement, but should not be applied alone where runoff quantities are significant.

Wood fiber (Excelsior) matting: Wood fiber matting is made by bonding wood excelsior fibers to a paper or plastic reinforcing net. The matting is generally purchased in rolls and stapled to slopes to provide a uniform covering which can protect mulches, provide enhanced water-holding capacity, and aid in moderating environmental fluctuations near the ground surface.

Plastic netting: Plastic netting (photo/biodegradable) is a monolithic plastic cloth-like material. It is used primarily to hold straw and other materials in place. Plastic netting is more durable than jute or wood fiber matting. It is much easier to handle and requires less labor, but it has no mulch capabilities itself. Plastic netting alone provides no soil stabilization or erosion control. It is best used to hold down mulches until vegetation becomes established.

Matting can be useful in the following circumstances:

- Construction sites becoming temporarily inactive (inactive period greater than 2 weeks and less than 1 year).
- Graded areas receiving permanent revegetation treatment by seeding.
- Bare areas receiving permanent revegetation treatment by seeding.

Limitations

Drainage area – 100 ac.
Minimum bedrock depth – 2 ft
NRCS soil type - ABCD
Drainage/flood control – no
Maximum slope – 100%
Minimum water table - N/A
Freeze/thaw – good

- Should not be used where overland water flow will exceed 6.5 ft/s. Because of the following characteristics of plastic netting and wood fiber matting, jute matting, straw or straw coconut matting are preferred.
- Plastic netting does not function as mulch (as does jute matting) since it does not absorb water. When plastic netting is used to anchor straw mulch, it increases the effectiveness of the mulch, but it does not provide direct control of erosion and sedimentation or nutrient generation. Straw mulch rates should be increased 25% when plastic netting is used instead of jute or straw.
- Wood fiber matting is more difficult to put in place than jute, and it is less predictable in controlling erosion. Properly applied, it can be as effective as jute matting at sediment and nutrient reduction. However, it is often 10 to 20% less effective.

Targeted Pollutants

Sediment

Design Parameters

- Jute matting should be fiber cloth of a uniform plain weave, undyed and unbleached single jute yarn, 3 to 4 ft wide and weighing an average 0.4 lb per linear foot of cloth with a tolerance of plus or minus 5%. It should have approximately 78 warp ends per width of cloth and 45 weft ends per linear meter of cloth. The yarn should be of a loosely twisted construction having an average twist of not less than 6.3 turns per 4 in. and should not vary in thickness by more than half of its normal diameter.
- Wood fiber matting should consist of machine-produced mats of curled wood excelsior, of which 80% have a 8 in. or longer fiber length. It should be of consistent thickness with the fiber evenly distributed over the entire area of the blanket (backing). The topside of each blanket should be covered with a 1 x 3 in. weave of twisted Kraft paper or biodegradable plastic mesh that has a high wet strength. Blankets should be fire and smolder resistant and contain no chemical additives. Blankets should be in rolls 3 to 4 ft wide and 130 to 200 ft long.
- Plastic netting with mesh opening from 1/10 x 1/10 in. to 1/5 x 1/5 in. should be applied over straw mulch similarly to the method specified below for jute matting.

Effectiveness: Jute matting acts similarly to straw mulch or hydromulch. Sediment reduction is typically 70 to 90% for up to 6 months, 40 to 60% for up to 2 years, and 10 to 30% beyond 2 years. Nutrient reduction is estimated at 50 to 70% for 6 months, 20 to 50% for up to 2 years, and 0 to 10% beyond 2 years.

Due to the difficulty of proper application, wood excelsior matting has a more variable effectiveness than straw, jute, or hydromulch. Properly applied, it can

be as effective. Sediment reduction should range from 50 to 90%, 20 to 60%, and 0 to 30% in 6 months, 2 years, and beyond 2 years, respectively. Nutrient reductions for the same time periods are estimated to be 30 to 70%, 10 to 50%, and 0 to 10%.

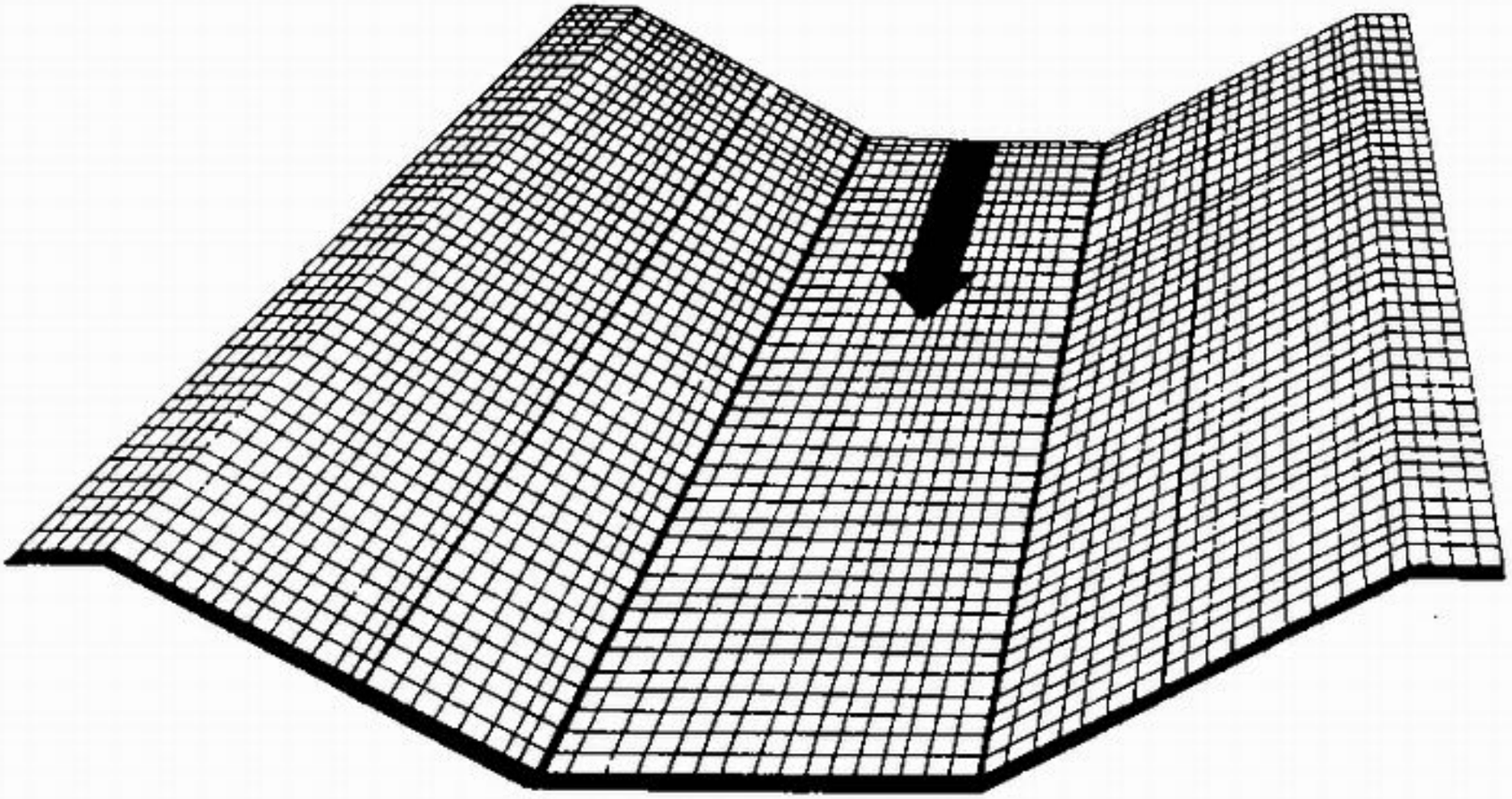
Construction Guidelines

The following guidelines apply to all matting and netting installations:

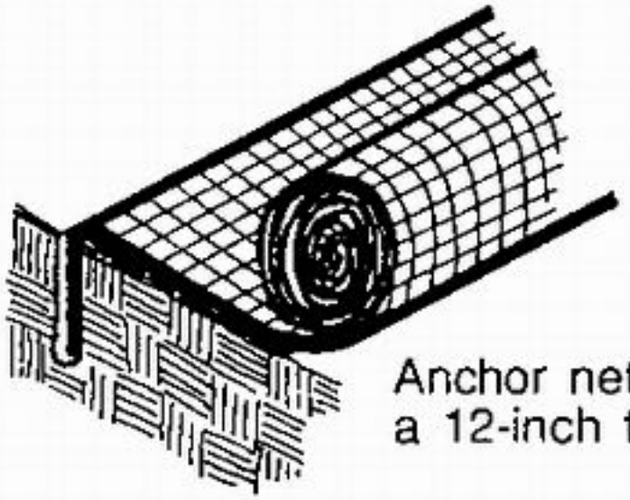
- The soil should be reasonably smooth. Fill and compact any gullies and rills. Rocks, vegetation or other obstructions that rise above the level of the soil should be removed.
- After site preparation and seeding (if any), the rolls of netting or matting should be rolled onto the surface from the top of the slope to the bottom of the slope. It is preferred that rolls are not constructed in a horizontal direction across the slope face. The rolling should follow water flow direction.
- At the top of the area, bury the end of each roll in a trench at least 8 in. deep. The trench should then be backfilled and tamped.
- Overlap the sides of rolls at least 4 in., and make sure that there is at least a 3 ft overlap when an uphill roll joins to a downhill roll. The uphill roll should overlie the downhill roll.
- Extend the matting beyond the edge of the mulched or seeded area at least 1 ft at the sides and 3 ft at the top and bottom of the area. If existing vegetation or structures mark the boundaries of the area, the matting should continue into the stable vegetated area or to the edge of the structure.
- Staples should be driven perpendicularly into the slope face. Place them approximately 3 ft apart down the sides and center of the roll, and not more than 1 ft apart at the upper end of a roll or at the end overlap of two rolls.
- Staples should be of heavy gauge wire (7/100 in. diameter or greater), bent into a "U" shape, with legs at least 6 in. long, and a 1 in. crown. Use longer staples and greater frequency in loose or sandy soil.
- Be sure the matting makes uniform contact with the slope face underneath. No “bridging” of rills or gullies should be allowed.
- If wood fiber matting is to be applied without other mulches, the minimum thickness of mat should be 1.5in. If the mat is to be applied over other mulches, the minimum mat thickness should be 0.5in.

Maintenance

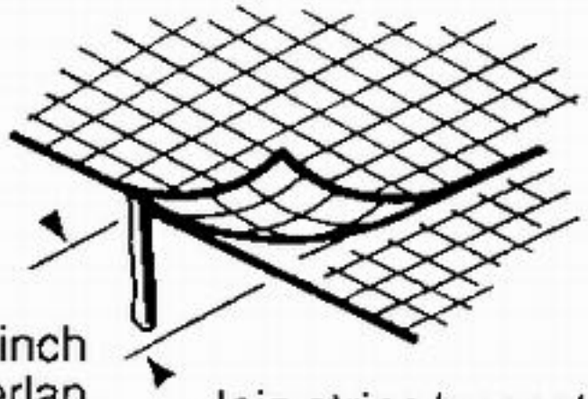
Inspect at regular intervals and after each runoff-producing storm event. Make repairs as necessary to restore complete coverage and full effectiveness of the matting or netting.



In channels, roll out strips of netting parallel to the direction of flow and over the protective mulch.



Anchor netting in a 12-inch trench



Join strips by anchoring and overlapping.