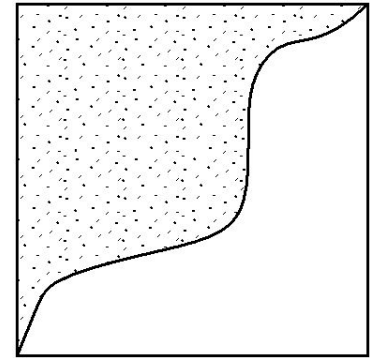


EC-11 GEOTEXTILES, PLASTIC COVERS & EROSION CONTROL BLANKETS/MATS

Refer to: ITD Standards and Specifications for Highway Construction, Sections 212, 621, and 711.

ITD Standard Drawing P-2-C.

QPL Category: 621 Erosion Blanket – Rolls (RECPs)



Standard Symbol

Definition and Purpose

This BMP involves the placement of geotextiles, mats, plastic covers, or erosion control blankets to temporarily stabilize disturbed soil areas and protect soils from erosion by wind or water.

Appropriate Applications

These measures are used when disturbed soils may be particularly difficult to stabilize, including the following situations:

- Steep slopes, generally steeper than 3:1
- Slopes with loose soils or non-cohesive sandy and/or silty material.
- Slopes and disturbed soils where mulch must be anchored.
- Disturbed areas where plants are slow to develop.
- Channels with flows exceeding 3 feet/second.
- Channels to be vegetated
- Stockpiles
- Slopes adjacent to water bodies of environmentally sensitive areas (ESAs).

Limitations

- Blankets and mats are more expensive than other erosion control measures, due to labor and material costs. This usually limits their application to areas inaccessible to hydraulic equipment or where other measures are not applicable, such as channels.

BMP Objectives	
<input type="checkbox"/>	Perimeter Control
<input checked="" type="checkbox"/>	Slope Protection
<input checked="" type="checkbox"/>	Borrow and Stockpiles
<input checked="" type="checkbox"/>	Drainage Areas
<input type="checkbox"/>	Sediment Trapping
<input type="checkbox"/>	Stream Protection
<input checked="" type="checkbox"/>	Temporary Stabilizing
<input checked="" type="checkbox"/>	Permanent Stabilizing

- Blankets and mats are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (because staples and netting can catch in mowers).
- Plastic sheeting is easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
- Non-degradable fabrics must generally be removed when permanent stabilization measures are ready to be installed. Failure to move these materials creates trash that may be environmentally harmful and may result in littering fines.
- Plastic results in 100 percent runoff, which may cause serious erosion problems in the areas receiving the concentrated sheet flow.
- The use of plastic should be limited to covering stockpiles, or very small graded areas for short periods of time (such as through one imminent storm event), until alternative measures, such as seeding and mulching, may be installed.
- Geotextiles, mats, plastic covers, and erosion control covers have maximum flow rate limitations. The manufacturer shall be consulted for proper selection.

Material Selection

There are many types of erosion control blankets and mats, and selection of the appropriate type shall be based on the specific type of application and site conditions.

Geotextiles

- A wide variety of Geotextiles are available, dependent on their intended uses which range from separation of different materials (such as road bedding and underlying soils) to lining ponds and landfills. For temporary erosion control, geotextile fabrics typically consist of woven or non-woven fabrics that are used to line channels or slopes and are usually used in combination with rock or other mulches or riprap.
- Geomembrane is a more impervious type of geotextile and can be used to cover stockpiles or bare soil areas, where a more durable material (as compared to plastic sheeting) is desired. The use of geomembranes for this application will likely be very limited due to their higher costs.
- Geotextiles should be secured in place with wire staples or sandbags and by keying into tops of slopes and edges to prevent infiltration of surface waters under Geotextile. Staples shall be made of 0.12-inch steel wire and shall be U-shaped with 8-inch legs and 2-inch crown.
- Geotextiles may be reused if, in the opinion of the Engineer, they are suitable for the use intended.

Plastic Covers

- Plastic sheeting shall have a minimum thickness of 6 millimeters and shall be keyed in at the top of slope and firmly held in place with sandbags or other weights placed no more than 10 feet apart. Seams are typically taped or weighted down their entire length, and there shall be at least a 12 to 24 inches overlap of all seams. Edges shall be embedded a minimum of 6 inches in soil.

- Any sheeting failures shall be repaired immediately. If washout or breakages occur, the material shall be re-installed after repairing the damage to the slope.

Erosion Control Blankets/Mats (Rolled Erosion Control Products)

Degradable rolled erosion control products (RECPs) are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100 percent degradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be degradable.

- **Jute** is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh. It is designed to be used in conjunction with vegetation and has longevity of approximately 1 year. The material is supplied in rolled strips, which shall be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Excelsior (curled wood fiber)** blanket material shall consist of machine-produced mats of curled wood excelsior. The excelsior blanket shall be of consistent thickness. The wood fiber shall be evenly distributed over the entire area of the blanket. The top surface of the blanket shall be covered with a photodegradable extruded plastic mesh. The blanket shall be smolder-resistant without the use of chemical additives and shall be non-toxic and non-injurious to plant and animal life. Excelsior blanket shall be furnished in rolled strips.
- **Straw blanket** shall be machine-produced mats of straw with a lightweight degradable netting top layer. The straw shall be attached to the netting with degradable thread or glue strips. The straw blanket shall be of consistent thickness. The straw shall be evenly distributed over the entire area of the blanket. Straw blanket shall be furnished in rolled strips.
- **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives. The material is designed to enhance revegetation. The material is furnished in rolled strips, which shall be secured to the ground with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Coconut fiber blanket** shall be machine-produced mats of 100 percent coconut fiber with degradable netting on the top and bottom. The coconut fiber shall be attached to the netting with degradable thread or glue strips. The coconut fiber blanket shall be of consistent thickness. The coconut fiber shall be evenly distributed over the entire area of the blanket. Coconut fiber blanket shall be furnished in rolled.
- **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a degradable mat. It is designed to be used in conjunction with vegetation and typically has longevity of several years. The material is supplied in rolled strips, which shall be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Straw coconut fiber blanket** shall be machine-produced mats of 70 percent straw and 30 percent coconut fiber with a degradable netting top layer and a degradable bottom net. The straw and coconut fiber shall be attached to the netting with degradable thread or glue strips. The straw coconut fiber blanket shall be of consistent thickness and shall be

evenly distributed over the entire area of the blanket. Straw coconut fiber blanket shall be furnished in rolled strips.

Non-degradable RECPs are typically composed of polyethylene, polypropylene, nylon, or other synthetic fibers. In some cases, a combination of degradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-degradable as well.

- **Plastic netting** is a lightweight biaxially-oriented netting designed for securing loose mulches like straw or paper to soil surfaces to establish vegetation. The netting is photodegradable. The netting is supplied in rolled strips, which shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Plastic mesh** is an open-weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than 2 inches. It is used with revegetation or may be used to secure loose fiber such as straw to the ground. The material is supplied in rolled strips, which shall be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light. The mat is a dense, three-dimensional mesh of synthetic (typically polyolefin) fibers stitched between two polypropylene nets. The mats are designed to be revegetated and provide a permanent composite system of soil, roots, and geomatrix. The material is furnished in rolled strips, which shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Bonded synthetic fibers** consist of a three-dimensional geomatrix nylon (or other synthetic) matting. Typically, it has more than 90 percent open area, which facilitates root growth. Its tough root-reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high volume discharges. It can be installed over prepared soil, followed by seeding into the mat. Once vegetated, it becomes an invisible composite system of soil, roots, and geomatrix. The material is furnished in rolled strips that shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high-strength continuous-filament geomatrix or net stitched to the bottom. The material is designed to enhance revegetation. The material is furnished in rolled strips, which shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

Qualified Products List Criteria

All rolled erosion control products shall meet the State of Idaho State Department of Agriculture Seed Laboratory or the North American Weed Management Association (NAWMA) noxious weed-free certification requirements prior to approval.

All RECPs shall:

- Have independent test results submitted shall be from either the National Transportation Product Evaluation Program (NTPEP) or an approved equivalent laboratory.

Site Preparation

- Prepare the site properly to ensure complete contact of the blanket or matting with the soil.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation, or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 2 to 3 inches of topsoil. When using a fabric or mat that is designed to be used in conjunction with seeding or revegetation, follow the manufacturer's guidelines for proper seedbed preparation, seed application, and/or planting.

Seeding

Seed the area before blanket installation for erosion control and revegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be re-seeded. Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Anchoring

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples and metal stakes shall be driven flush to the soil surface.
- All anchors shall be a minimum of 6 inches long and have sufficient penetration to resist pullout. Longer anchors may be required for loose soils as determined by the responsible party or by manufacturer's installation guidelines.

Installation on Slopes

Installation shall be in accordance with the manufacturer's recommendations or ITD Standard Drawing P-2-C.

Installation in Channels

Installation shall be in accordance with the manufacturer's recommendations or ITD Standard Drawing P-2-C.

Soil Filling (if specified for turf reinforcement)

- Always consult the manufacturer's recommendations for installation.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes, or brooms for fine grading and touch up.
- Smooth out soil filling, just exposing top netting of mat.

Blanket Removal

When no longer required for work, non-degradable temporary blankets shall be removed from the site and disposed.

Maintenance and Inspection

- Inspections shall be conducted as required by the NPDES permit or contract specifications.
- Areas treated with temporary geotextiles, mats, blankets, and other covers shall be maintained to provide adequate erosion control. Any failures shall be repaired immediately.
- If washout or breakage occurs, reinstall the material after repairing the damage to the slope or channel.