CALTRANS EROSION CONTROL NEW TECHNOLOGY REPORT

CTSW-RT-03-049

California Department of Transportation
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June 2003

Caltrans has an ongoing program to evaluate new and developing technologies for storm water management. Erosion control practices and products are part of this evaluation. "New technologies" include practices and products that have recently been developed, as well as existing practices and products that have not been selected as Best Management Practices (BMPs) by Caltrans. This report focuses on practices and products applicable to upland areas. The overall goals of the Caltrans Erosion Control New Technology Report are to identify promising practices and products for future pilot studies. New practices and products will be recommended by Caltrans, as applicable, to new construction and retrofit projects.

This report evaluates erosion control practices and products, which stem from methods, often biotechnical, rather than application of a specific product. The evaluation focuses on the capacity of each product or practice to protect surface soils from erosion or to contain sediments generated upslope of the point of installation.

Section One provides background information and study objectives, and it summarizes the organization of this report. Section Two describes the sources used to identify new practices and products. Section Three describes the evaluation process and criteria used to assess the performance of a particular product or practice.

A total of 37 practices and 262 erosion control products were evaluated. Fact sheets for each practice and product evaluated are provided in Appendices A and B, respectively; the fact sheets are preceeded a list of practices or products. Each appendix is introduced by User's Guide that describes criteria used to conduct the evaluations. Appendix A includes a list of references used to compile the practices fact sheets.

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1.0 INTRODUCTION

The Erosion Control New Technology Report consolidates information on technologies that have been recently developed and that have potential applicability as part of the Caltrans *Statewide Storm Water Management Plan* (SWMP) (Caltrans, 2001). Caltrans collects information on new types of products and methods for review by Caltrans' Storm Water Advisory Teams (SWATs). Erosion control practices and products are one element in the overall evaluation and development of new Best Management Practices (BMPs). This report summarizes available information regarding design, specifications, application, effectiveness, relative cost, as well as issues of concern relevant to Caltrans' facilities. Fact sheets were developed for each practice and product to facilitate comparison and evaluation of new technologies.

This report represents the initial step in the process of identification and selection of new BMPs. Caltrans' SWATs will review the report to assess practices and products with the following possible outcomes: where sufficient information exists, designate a specific practice and product; for promising technologies, commission pilot studies to determine the effectiveness and applicability to conditions at Caltrans' facilities; or reject practices and products that do not achieve desired results or do not meet Caltrans' criteria.

1.1 BACKGROUND

Highway construction and many retrofit projects have grading components that expose surface and subsurface soils. Additionally, human activities and natural processes often result in the generation of sediments topographically above Caltrans' rights-of-way. Sediments (bedload and suspended particulates) are considered pollutants, which are subject to control to the maximum extent practicable (MEP). For construction projects that disturb one acre or more, technology-based requirements include the "best conventional pollutant control technology" (BCT) and "best available technology economically achievable" (BAT), consistent with Chapter 3 of the SWMP.

Within this document, BMPs include actions and physical controls installed on a site to control erosion from the site and, as appropriate, to trap sediments above storm water collection facilities. The term BMP refers to both practices and products to control the generation and transport of sediments.

This report identifies practices and products that may become BMPs. Information contained in this report will be used to further evaluate technologies presented and approve those that meet Caltrans' requirements for BCTs and BATs. The process of identification and evaluation of potential BMPs will be

repeated periodically to capture new practices and products that may prove useful to the Caltrans' program to implement the requirements of the SWMP.

1.2 REPORT ORGANIZATION

This report consists of three sections and two appendices. Section Two describes the sources used to identify new erosion control technologies. Section Three describes the evaluation process and criteria used to assess the performance of a particular product or practice. Appendix A contains a list of erosion control practices reviewed, 37 fact sheets, and a list of references. Appendix B contains a list of erosion control products reviewed and 262 fact sheets. Each appendix is introduced by a User's Guide that explains the criteria used in the evaluation process.

2.0 NEW TECHNOLOGY RESEARCH

2.1 INFORMATION SOURCES

The primary research avenues are discussed below.

Researchers gathered information from proceedings of conferences, seminars, and similar events. Sources used include:

- Caltrans Erosion Control Contractors and Material Suppliers Annual Meeting, Sacramento, June 14. 2001.
- How to Select, Install and Inspect Construction Site Erosion and Sediment Control BMPs for NPDES Storm Water Permit Compliance, International Erosion Control Association, Modesto, September 13-14, 2001.
- The Use of Native Grassland Plant Species for Roadside Revegetation, California Native Grass Association, Sacramento, October 2-3, 2001.
- Other conferences, seminars, and workshops as appropriate and available within the project time frame.

Caltrans publications and erosion control-related in-house review studies; magazines including *Erosion Control, Land and Water*, and *Stormwater*; and other publications, such as peer-reviewed professional journals with pertinent, current information on new or recently developed practices and products, were reviewed.

Searches were made on the internet for websites of appropriate agencies, manufacturers, and distributors. Detailed product information was requested, as appropriate.

This task included review of product descriptions, evaluations, industry technical reviews, and performance data available from vendors, product developers, and manufacturers. The primary focus of this task was to review sources that provide relatively detailed product and performance specifications.

Contacts were developed in Caltrans and other agencies whose activities encompass erosion control. Landscape architecture and maintenance units were contacted, as were transportation agencies in other states. Information available from contractors who develop and/or install erosion control practices and products was incorporated.

References are incorporated into the User's Guides that introduce each of the appendices.

3.0 EVALUATION

3.1 EVALUATION CRITERIA

Products were evaluated according to a standardized set of criteria to the maximum extent feasible. The criteria include, but are not limited to, the following:

- Product design.
- Product name and supplier information.
- Consistency (*i.e.*, uniformity or predictable performance specifications).
- Range of conditions and locations suitable for application.
- Longevity (applicability as temporary or permanent; short- medium- or long-term).
- Maintenance requirements.
- Complexity.
- Relative effectiveness compared to an existing accepted erosion control method.
- Ecological effects.
- Availability.
- Difficulty of installation and equipment needed for installation.
- Performance measurability.
- Any additional training required for implementation.
- Cost of materials and cost relative to current technologies.
- Treatment efficiency (ability to remove or retain Total Suspended Solids, etc.).

3.2 EVALUATION SHEETS

Fact sheets were developed for each new practice and product identified. Each sheet presents summarized information to assess the potential applicability of individual practices and products (or product categories) to conditions and situations that occur at Caltrans' facilities. Figures 1 and 2 provide sample fact sheets developed for these evaluations.

3.3 CATEGORIES OF TECHNOLOGIES AND PRODUCTS

The practices evaluation consisted of actions that were categorized as follows:

- Bioengineering
- Waterway
- Upslope
- Mulch

- Soil Amendment

The evaluation of manufactured products fell into the following categories:

- Accessory
- Biological Activity Stimulant
- Bonded Fiber Matrix
- Cell Confinement System
- Fiber Roll / Wattle / Log
- Flocculator
- Hydraulic Soil Stabilizer
- Hydromulch
- Hydroseed-Mulch Additive
- Rolled Erosion Control Product (RECP)
- Sediment Barrier
- Soil / Plant Amendment
- Turf Reinforcement Mat (TRM)

Slip sheet-Insert blank fact sheet.

Fact sheets were developed for each erosion control practice identified. Each fact sheet presents summary information to be used by Caltrans to evaluate the potential applicability of a given practice to various Caltrans projects. The information includes a description of the practice; discussion of its erosion control function, effectiveness, notes, specifications (climate zone, location, soil category, aspect, steepness, graphic or photo, BMP ID, SWMP category, Caltrans slope type, and status), design elements, ancillary facilities, construction costs, and consideration of issues and concerns, including maintenance elements (maintenance requirements and staffing/equipment), project development elements (construction, construction complexity, constraints, and advantages), and a list of report sources and additional information. Each of the above topics included on the fact sheets is discussed below.

A.1 EROSION CONTROL PRACTICE DESCRIPTION

A description of the erosion control practice is presented at the top of each fact sheet. The description provides a summary of the practice with consistent keywords to facilitate sorting. The keywords used are: bioengineering, waterway, upslope, mulch, and soil amendment.

A.2 EROSION CONTROL FUNCTION

This section discusses how the practice works to reduce or repair erosion, sediment, and/or runoff.

A.3 EFFECTIVENESS

Erosion control effectiveness is the ability of a Best Management Practice (BMP) to reduce soil erosion relative to the amount of erosion measured from bare soil.[1] Hydromulch, for example, typically can reduce soil loss by 50-60%. Practice effectiveness is expressed as high, medium, or low using the following criteria:

- *High:* average erosion control percentage was equal to or greater than 70%.
- *Medium:* average erosion control percentage was between 50% and 69%.
- *Low:* average erosion control percentage was below 50%.

[1] Source: *Erosion Control Pilot Study Report,* Caltrans, June 2000, CTSW-RT-00-012, Table 4-1.

A-3.1 Confidence Level of Effectiveness Rating

The level of confidence in the erosion control effectiveness is expressed as high, medium, or low, based on the following criteria:

- *High:* existing data is adequate enough that no field testing will be needed.
- *Medium:* existing data is adequate enough that probably no field testing will be needed.
- *Low:* there is a lack of sufficient information to determine that the practice will perform as described by its manufacturer and/or distributor. Field testing will be required.

A.4 NOTES

These notes may qualify effectiveness and level of confidence regarding effectiveness, as well as provide additional information and insights.

A.5 SPECIFICATIONS

The specifications section contains available quantitative information. Fields regarding appropriate climate zone, location, soil category, aspect, steepness, graphic or photo, Caltrans BMP ID, SWMP category, Caltrans slope type, and status are included. Specifics of each field are discussed below.

A-5.1 Climate Zone

The climate zones where the practice may be suitable are described as mountain, coastal, desert, and/or valley.

A-5.2 Location

Locations where the practice may be suitable are described as rural and/or urban.

A-5.3 Soil Category

Soil categories where the practice may be suitable are described as rocky and/or not rocky. Rocky soils conform to USDA rockiness classes 3-5 where sufficient bedrock outcrops make the use of agricultural machinery impracticable.[2]

A-5.4 Aspect

Aspects where the practice may be suitable are described as north, east, south, west, and/or N/A (not applicable).

[2] Source: USDA. 1962. *Soil Survey Manual*. USDA Handbook #18, page 221.

A-5.5 Steepness

Steepness where the practice may be suitable is divided into four ratios:

- Max. 1v:3h
- Max. 1v:2h
- Max. 1v:1h
- >1v:1h

A-5.6 Photo or Graphic

When available, a photo or graphic of the erosion control practice is included.

A-5.7 Caltrans BMP ID

Many practices do not fit into the prescribed Caltrans BMP IDs. New IDs should be created to better categorize various erosion control practices. Three general categories of permanent construction BMPs have been identified in Table 4-1 of the Caltrans' *Statewide Storm Water Management Plan* (SWMP) (Caltrans, 2001). They include:

- Preservation of Existing Vegetation (PEV)
- Concentrated Flow Conveyance Systems
- Slope / Surface Protection Systems

See Table A-1 below for a list of the permanent construction BMP ID codes used in the facts sheets. In some cases (i.e., SS-2, SS-9, SS-10, etc.), a Caltrans-assigned temporary BMP-ID is used when the practice may also be permanent. Details are found in Caltrans' *Project Planning and Design Guide Manual* (Caltrans, 2000).

Table A-1: Caltrans Approved Permanent Construction BMPs

BMP ID Used in Fact Sheets	BMP Name
Preservation of Existing Vegetation:	
SS-2	Preservation of existing vegetation
Concentrated Flow Conveyance Systems:	
SS-9	Earth dikes / drainage swales & lined ditches
OD	Overside drains
FCES	Flared culvert end sections
SS-10	Outlet protection / velocity dissipation devices
SS-11	Slope drains
Slope/Surface Protection Systems:	
STS	Slope roughening / terracing / rounding
M	Mulching
PSP	Permanent Seeding and Planting
HS	Hard surfaces

Four general categories of temporary construction BMPs have been identified in the *Construction Site Best Management Practices (BMPs) Manual* (Caltrans, 2003). They include:

- Temporary Soil Stabilization (SS)
- Temporary Sediment Control (SC)
- Wind Erosion Control (WE)
- Tracking Control (TC)

See Table A-2 below for a list of the temporary construction BMP ID codes used in the facts sheets. Details are found in Caltrans' *Construction Site Best Management Practices (BMPs) Manual* (Caltrans, 2003).

Table A-2: Caltrans Approved Temporary Construction BMPs

Caltrans BMP ID	BMP Name
Temporary Soil Stabilization:	
SS-3	Hydraulic mulch, bonded fiber matrix
SS-4	Hydroseeding
SS-5	Soil binders
SS-6	Straw mulch
SS-7	Geotextiles, plastic covers, erosion control blankets / mats, rolled erosion control products (RECP)
SS-8	Wood mulching
SS-9	Earth dikes / drainage swales & lined ditches
SS-10	Outlet protection / velocity dissipation devices
SS-11	Slope drains
Temporary Sediment Control:	
SC-1	Silt fence
SC-4	Check dam
SC-5	Fiber rolls
SC-6	Gravel bag berm
SC-8	Sandbag barrier
SC-9	Straw bale barrier
SC-10	Storm drain inlet protection
Wind Erosion Control:	
WE-1	Wind erosion control
Tracking Control:	
TC-1	Stabilized construction entrance / exit
TC-2	Stabilized construction roadway
TC-3	Entrance / outlet tire wash

A-5.8 SWMP Category

The SWMP category is described as IB: Permanent and II: Temporary. Permanent practices will not be removed prior to contract closeout. Temporary practices will be removed before contract closeout; they are used to contain erosion during construction only.

A-5.9 Caltrans Slope Type

The Caltrans slope type where the practice may be suitable for use is described as cut and / or fill.

A-5.10 Status

The Caltrans approval status includes:

- Approved Standard Spec
- Approved Special Provisions
- Approved Case by Case
- Not Approved

A.6 DESIGN ELEMENTS

This section identifies important design considerations that have been highlighted by vendors, literature, testing, and / or users.

A.7 ANCILLARY FACILITIES

The ancillary facilities section contains supplemental information, for example, if the practice will trigger the use of an associated product or practice or require specialized equipment, unusual space, or access considerations.

A.8 CONSTRUCTION COST

Construction costs are assessed using hydromulch with seeding as the standard of comparison. Hydromulch with seeding has an average construction cost of $2,224 to $2,964 per hectare, which is considered low.[3] Construction costs are expressed as high, medium, or low using the following criteria:

[3] Source: *Erosion Control Pilot Study*, Caltrans, June 2000, CTSW-RT-00-012, Table 4-1.

- *High:* average construction costs of more than $72,300 per hectare.
- *Medium:* average construction costs of more than $3,211 but less than $72,300 per hectare.
- *Low:* average construction costs of less than $3,211 per hectare.

A.9 ISSUES AND CONCERNS

A-9.1 Maintenance Requirements

The maintenance requirements section summarizes routine maintenance tasks required to keep the practice functional.

A-9.2 Maintenance Staffing/Equipment

The maintenance staffing / equipment section identifies the level of staff and the skills required to perform the maintenance, as well as any specialty equipment.

A.10 PROJECT DEVELOPMENT

A-10.1 Construction

This section lists construction issues, including patents, type of equipment required for installation or implementation, and other key or unusual construction elements.

A-10.2 Construction Complexity

Construction complexity is described as high, medium, or low based on the following criteria:

- *High:* construction will require specialized equipment and / or labor skills.
- *Medium:* construction will require equipment that is readily available and / or journeyman worker skills.
- *Low:* construction will require nominal equipment and / or unskilled labor.

A-10.3 Constraints

This section lists additional constraints of the practice that were not covered in the previous sections. Information presented may include impacts from hydrologic characteristics and weather conditions in California, experiences from actual field use, and expansion of particular points discussed in previous sections of the fact sheet.

A-10.4 Advantages

This section highlights practice-specific advantages and may list additional advantages that were not covered in the previous sections.

A.11 REPORT SOURCES

This section is a list of references used to prepare the fact sheet.

A.12 ADDITIONAL INFORMATION

This section indicates where to find additional information or vendors.

APPENDIX A.2
LIST OF PRACTICES

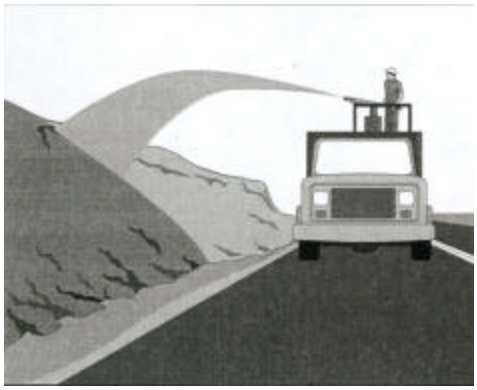
Biostimulants
Biotechnical Headcut Repair
Brush Barrier
Brush Checkdam
Brush Layering
Brush Mattress
Compost Soil Amendment and Mulch
Contour Furrows
Fiber Roll Anchoring with Rope Restraint
Fiber Soil Reinforcement
Filter Wedge
FREF Fiber Reinforced Earth Fill with Brush Layers
FREF Headcut Repair with Brush Layers
Furrow Planting
Land Imprinting
Live Fascines (Wattles)
Live Staking
Loose Rock Headcut Repair
Micro Soil Nailing
Mycorrhizal Soil Inoculant
Pole Drains (Fascine Drains)
Pole Planting
Rock Roll Revetment (Vegetated Rock Rolls)
Rock with Interstitial Fill
Serrated Slope
Slope Grating
Stepped Slope with Topsoiling
Terraced Slope with Topsoiling
Topsoiling
Topsoiling with Cellular Confinement
Turf Reinforcement Mat with Perennial Vegetation
Vegetated Crib Walls
Vegetated Filter (Buffer) Strip
Vegetated Gabions
Vegetated Rock Revetment (Joint Planting)
Willow Wall Revetment (Willow Wall)
Wood Chip Berm

Erosion Control Practices Fact Sheet
Biostimulants

Caltrans
New Technology Report

Description:

Organic soil amendments with humic acids are incorporated into the soil to enhance plant growth. Also referred to as "natural organic-based fertilizer." Liquid or dry formulations build soil structure and soil biota to improve plant growth without high nitrogen or phosphorus inputs.



Biostimulants

Erosion Control Function:

Improved cover and soil structure will develop with a corresponding reduction in runoff volume and/or velocity and sediment transport.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Design Elements:

Need to know surface area and soil type to determine application rates.

Effectiveness:

Low

Confidence Level in Effectiveness Rating
Low

Notes:

Ancillary Facilities:

In newly seeded areas, straw mulch, hydromulch, erosion control blanket, or other cover may be required during plant establishment period. Compatible with other practices, including wattles, slope-stepping, and biotechnical solutions.

Specifications:

Climate Zone
Valley
Desert
Mountain
Coastal

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max 1v:1h

Cost: Low

Issues and Concerns

Maintenance:

Requirements

Inspect weekly and after significant storm events until vegetation is established, then routinely thereafter. Repair eroded or damaged areas as needed.

Staffing/Equipment

One person with a shovel or McLeod. Additional erosion control blanket or straw may be needed for repairs.

Project Development:

Construction

Patented products. Broadcaster or hydromulcher typically used for application. Apply as top dressing to existing vegetation or add to soil at time of seeding.

Construction Complexity Low

Constraints

May run off steep slopes before it is incorporated into soil.

Advantages

Simple process. Helps develop vigorous vegetation, increases cover, and enhances soil anchoring. Can be applied with irrigation water or hydromulch.

Report Sources:

PBI/Gordon Corporation, http://www.pbigordon.com

Additional Information:

Rocky Mountain Bio-Products, Inc., http://www.biosol.com/usa

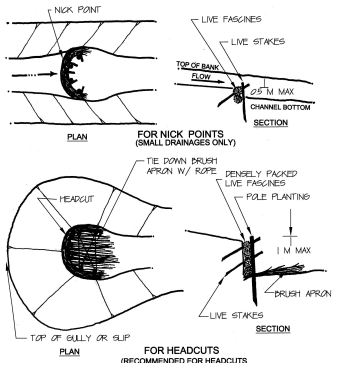
Erosion Control Practices Fact Sheet
Biotechnical Headcut Repair

Caltrans
New Technology Report

Description:

Biotechnical headcut repairs can be used to stabilize small nickpoints and headcuts under 1 m in height in gullies and small ephemeral drainages. The repair consists of driving vertical willow poles or stakes directly downstream of the headcut. Live fascines or live brush are densely packed between the poles and the headcut's face. The brush is compressed by driving wood stakes or live stakes at a 45 degree angle into the headcut's face. A brush apron is recommended.

Keywords: Bioengineering, waterway.



Biotechnical Headcut Repair

Erosion Control Function:

Used to stabilize downcutting gullies by stopping the upstream advancement of nickpoints or headcuts. As material sprouts, it acts as a coarse sediment filter. The smaller the height of the nickpoint or headcut, the more effective this technique becomes.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut

Status
Not Approved

Design Elements:

Many variations of this technique can be designed that incorporate on-site materials and/or erosion control blankets.

Drainage area and flows should be evaluated, and channel profile should be surveyed. This repair should only be used in small drainages. Maximum recommended height for headcuts at the top of gullies is 1 m; maximum recommended height for in-channel nickpoints is 0.5 m.

If fascines are used, install poles with 150 mm of space in front of headcut. Fascines should have a diameter of approximately 200 mm for snug fit between poles and headcut face.

Ancillary Facilities:

No staging area is required.

Specifications:

Climate Zone
Coastal
Mountain
Valley

Location
Rural

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max. 1v:3h

Cost: Low

Erosion Control Practices Fact Sheet
Biotechnical Headcut Repair

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Check the repair for piping. Addtional brush may need to be added or stakes driven further to compress brush. Ideally, inspect after all large runoff events. Temporary irrigation may be needed in drought areas.

Staffing/Equipment

Hand crew with hand tools.

Project Development:

Construction

Can be constructed by hand crews. Material collection (willows) is required during dormant season. Hand auger is required for live poles, and sledge hammers are needed for stakes.

Construction Complexity Medium

Constraints

This repair should only be used in small drainages. Does not work in large drainages or headcuts with heights over 1 m. Brush has a low survival rate without good soil contact and moisture. If brush is not packed firmly, can lead to piping behind repair. Does not work well in hard pan soils or rocky conditions.

Advantages

Easy construction. Can be constructed out of on-site native plant materials by hand crews. Ideal for areas with poor access. Fast and inexpensive to construct. Can be installed as a temporary emergency repair during the wet season with low impacts. Live fascines and live brush are flexible and will conform to various headcut shapes without excavation.

Report Sources:

Prunuske Chatham, Inc. Biotechnical Headcut Repair Standard Detail. 2002.

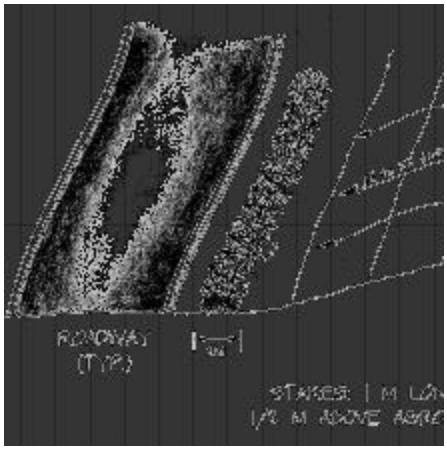
Additional Information:

Erosion Control Practices Fact Sheet
Brush Barrier

Caltrans
New Technology Report

Description:

Brush barrier filter placed at the edge of construction area or on contour to provide a niche for plant establishment. On rural sites where brush is plentiful and readily available from clearing activities, a brush barrier can be used as a temporary sediment filter on small, gentle slopes.



Brush Barrier

Erosion Control Function:

Sediment-laden runoff is filtered or allowed to settle out. Low efficiency but useful on small job sites with gentle slopes. Caltrans CD39(2) shows a similar practice called a brush filter with filter fabric on top. This is similar to brush wattles only less labor intensive (no trenching); it is not necessarily a slope break technique.

Effectiveness:

Low

Confidence Level in Effectiveness Rating

Medium

Notes:

Caltrans BMP ID

None

SWMP Category

IB: Permanent
II: Temporary

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Slopes must be 5% or less, with an uphill slope distance of 33 m or less when used as a filter. Barrier should be placed on contour. When used as a plant establishment niche, steeper slopes are acceptable.

Ancillary Facilities:

Areas of bare soil should be mulched or otherwise stabilized.

Specifications:

Climate Zone

Mountain
Coastal
Valley
Desert

Location

Rural

Soil Category

Not rocky

Aspect

North
East
South
West

Steepness

Max. 1v:3h

Cost: Low

Erosion Control Practices Fact Sheet
Brush Barrier

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Replenish brush as the pile settles to maintain a 0.6 m height. Brush may be left on site in rural areas to provide habitat if fire hazard or other issues are not of concern.

Staffing/Equipment

Loppers, pruning saw, wheelbarrow, or loader.

Project Development:

Construction

Source of material should be suitable, non-toxic, and locally available to be practical. Simple hand tool or loader construction. Brush is piled and compacted (with a loader bucket or similar tool) on contour in a row 1 m high by 2 m or more wide. 1 m or longer wood stakes are installed on either side of the row at 1 m intervals (alternating), and natural fiber rope is tied across the pile from stake to stake. The stakes are then pounded in further to cinch down and compact the brush.

Construction Complexity Low

Constraints

Brush may have to be removed if there is a fire hazard or other constraints. Not appropriate for contributing drainage areas greater than 2 ha. Eucalyptus, chamise, or other brush that contain inhibitory chemicals should not be used for this practice. Ponding water may be a concern if filter fabric is added as shown in some specifications. The use of filter fabric is not recommended.

Advantages

Where suitable brush is available without cost and slopes are gentle, this is an inexpensive, temporary method to confine, direct, and filter sediments in runoff from construction zones and to create barriers to restrict unauthorized access. In rural areas, or where fire hazard or other constraints are not an issue, the brush can be left in place to decompose after project completion. Brush also provides habitat for wildlife. May be used on steeper slopes to provide niches for plant establishment.

Report Sources:

Caltrans Construction Contractors Guide and Specifications. “Section 5 Guidance for Use of Working Details for Temporary BMPs, Sediment Controls, CD39(2).” Caltrans Storm Water Quality Handbook. April, 1997.

Washington Dept. of Transportation.

Prunuske Chatham, Inc. Brush Barrier Standard Detail. 2002.

Additional Information:

Caltrans Construction Contractors Guide and Specifications. Caltrans Storm Water Quality Handbook. April, 1997.

Erosion Control Practices Fact Sheet
Brush Checkdam

Caltrans
New Technology Report

Description:

Small, incised gullies and slope drains are stabilized with on-site brush materials. Gullies up to 2 m deep and 5 m wide can be treated with a series of brush checkdams. As sediment collects behind the dams, natural revegetation gradually provides more long-term stabilization. This is a low-tech approach to gully stabilization with excellent retrofitting potential.

Keywords: Bioengineering, waterway.

Brush Checkdam

Erosion Control Function:

A brush checkdam filters runoff by collecting sediment behind the brush. It aggrades downcut gullies and stabilizes banks in steep gradient, low order channels. When live willow stakes are used, it provides a permanent, flexible repair.

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut

Status
Not Approved

Design Elements:

Install upright posts in gully. Pack brush tightly between posts with butt ends upstream. Center of brush checkdam must be lower than sides. Pack down brush by standing on top, and install cross piece laced to posts with wire. Straw or leaf litter at the upstream end initiates the filtering of sediment in early flows. Spacing between checkdams is determined by running a level line from the top of the downstream checkdam to the bottom of the gully upslope.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Ancillary Facilities:

Small area required to stockpile brush and equipment.

Specifications:

Climate Zone
Mountain
Coastal
Valley

Location
Rural

Soil Category
Not rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance:

Requirements

Inspect on a regular basis during winter period. Add and compact brush and add straw between structures as needed.

Staffing/Equipment

Hand tools, hand labor.

Project Development:

Construction

Hand labor construction using post hole diggers, pruning saws, chain saws, tamping bars, and shovels. Constructed entirely with hand tools in areas where brush or tree branches are plentiful.

Construction Complexity Low

Constraints

Useful in small watershed areas (1 ha. or less). May require addition of brush over a period of a few years. Not recommended for gullies in clay soils. Headcuts may require more substantial repairs.

Advantages

Uses natural, on-site, inexpensive materials. Easy construction. Porous structure allows water to flow through, while reducing velocity and trapping sediments. Allows for natural recruitment of vegetation within and above structures.

Report Sources:

Gray, D., and A. Leiser. Biotechnical Slope Protection and Erosion Control. Van Nostrand Reinhold Co., N.Y. 1982.

Prunuske Chatham, Inc. Brush Checkdam Standard Detail. 2002.

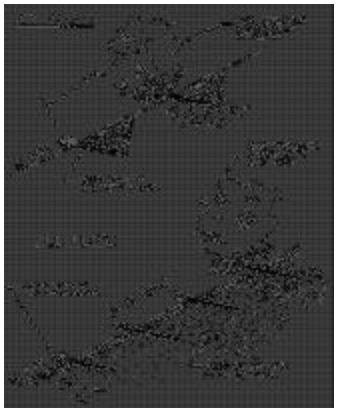
Additional Information:

Erosion Control Practices Fact Sheet
Brush Layering

Caltrans
New Technology Report

Description:

Brush layering is placement of live brush perpendicular to a slope's contour on cut or fill benches that are then backfilled in compacted lifts. The tips of the brush extend just past the surface of the fill slope and act as sediment filters and slope breaks, reducing runoff velocities. Placing the brush horizontally on the constructed bench helps reinforce the slope's soils by creating a dense matrix of branches similar to geotextile fabrics used in engineered fill lifts. Brush layers also act as horizontal slope drains on saturated slopes.
Keywords: Bioengineering, upslope.



Brush Layering

Erosion Control Function:

Brush layering acts as a coarse sediment filter immediately after installation. With plant establishment, surface erosion (rain drop, sheet, and rill) is prevented by vegetative cover. Root structure mechanically reinforces the soil by increasing shear strength, which resists shallow slides.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating

Low

Notes:

Brush layering has been used with success by John Haynes in Disrict 7 along Hwy. 33 in Ventura County and SHA 299 near Buckhorn Summit.

Specifications:

Climate Zone
Mountain
Coastal
Desert
Valley

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max. 1v:2h

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Design Elements:

Designed slope gradient. Geotechnical and hydrologic conditions must be evaluated. Cut or fill slope. Hedge layering is a variation on regular use of rooted plant material.

Ancillary Facilities:

Temporary sediment control facilities at bottom of slope during construction. Drip irrigation is required in some locations. Can be used with geotextiles or natural fiber mats (see FREF [Fabric reinforced earth fills] with brush layers). Temporary water-holding capability for storage of brush.

Cost: High

Erosion Control Practices Fact Sheet
Brush Layering

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Weeding and dry-season irrigation during plant establishment. Monitor weekly during winter and correct surface rilling. Typically, redirect water, fill rills, compact, and secure with erosion blanket.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Heavy equipment, including excavator or dozer for earthwork, and loaders for fill. Hand crews for brush harvesting and installation. Water storage facility for submerging brush.

Construction Complexity High

Constraints

Not recommended for rocky slopes, slopes with extremely low soil moisture through the dry season, slopes with no equipment access, or slopes with concentrated or overland flow (i.e., culvert outfall). 1v:2h maximum slope.

Advantages

Provides immediate slope reinforcement from unrooted brush. As roots develop, slope stability and shear resistance are improved. Creates slope breaks that shorten slope length and reduce runoff velocities. Creates vegetative filters for debris. Increases infiltration rates on dry sites. Acts as horizontal drain on wet sites. Allows for vegetation establishment, cover, and natural recruitment.

Report Sources:

Haynes, John. Caltrans District 7. Personal communication, 2001. John_Haynes@dot.ca.gov.

Robbin Sotir and Associates.

Prunuske Chatham, Inc. Brush Layering Standard Detail. 2002.

Additional Information:

Schiechtl, H.M. Bioengineering for Land Reclamation and Conservation. 1980.

Gray, D.H., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Sotir, Robbin B., and Donald H. Gray. “Soil Bioengineering for Upland Slope Protection and Erosion Reduction.” Engineering Field Handbook. Chapter 18. USDA Natural Resource Conservation Service. 1992.

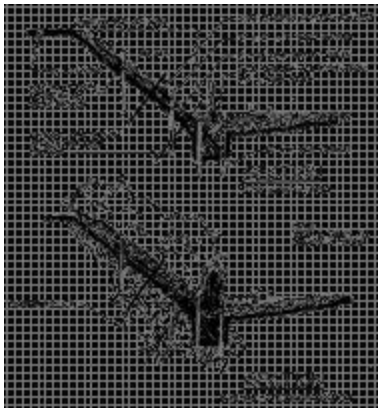
Erosion Control Practices Fact Sheet
Brush Mattress

Caltrans
New Technology Report

Description:

Installation of a dense cover of brush that is staked and secured to protect eroding banks, slopes, or shorelines. Live willow brush is typically used in streambank or other wet slope locations where willows will sprout and root, creating a dense matrix of roots. Brush is anchored by wood, steel, or live stakes and secured firmly to the bank by a system of rope or wire. The butt ends of the brush are placed in a toe trench that can be protected by a loose rock toe, coir logs, live fascines, or rock rolls. Perennial plantings can be installed through the brush mattress.

Keywords: Bioengineering, waterway.



Brush Mattress

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Erosion Control Function:

Brush mattresses can provide immediate protection against erosion on cut or fill slopes. Once plants are established, improved cover and soil structure reduce runoff and sediment transport. Brush will capture sediment during flood events.

Design Elements:

Normally suitable to protect cut or fill slopes 1v:2h or flatter, but can be used on up to 1:1 slopes in some cases. Can be used with coir erosion control blanket beneath brush in sandy soils. 50% soil cover is critical for root development. Brush mattress can withstand high runoff velocities.

Effectiveness:

High

Confidence Level in Effectiveness Rating
Medium

Notes:

Effectiveness rating is based on contractor experience. Brush mattresses are effective when installed correctly and with attention to detail.

Ancillary Facilities:

Minimal. Requires a source for brush material. Mattresses are constructed in place.

Specifications:

Climate Zone
Coastal
Mountain
Valley

Location
Rural

Soil Category
Not rocky

Aspect
North
East
West

Steepness
Max 1v:1h

Cost: Medium

$225 to $375 per linear m of streambank. Cost depends on willow collection source, if grading is required or not, and the type of toe installed.

Issues and Concerns

Maintenance:

Requirements

Inspect contact of brush mattress to soil. Increase staking and rope or wire anchoring if mattress loosens. Inspect for rilling under the brush mattress in sandy soils (erosion control blanket should be used under brush mattress on sandy soils).

Staffing/Equipment

Hand crew.

Project Development:

Construction

Backhoe or excavator to achieve smooth slopes. Dead brush may be reserved from site clearing operations. Hand crew for brush mattress construction.

Construction Complexity Medium

Constraints

Success varies on slopes steeper than 2h:1v. A toe trench should be excavated to provide drainage in wet areas. Because brush is laid on slope, temporary surface irrigation is recommended in most cases for good root development of live material. Plantings through brush mattresses may require irrigation until established. Limited utility on rocky slopes.

Advantages

Creates an immediate protective cover on slope surfaces even before plant development. For live mattresses, branches establish roots, further protecting soils. Provides protection for new plantings on upland slopes. Drip irrigation can be installed under mattresses to spot-irrigate tree and shrub plantings. Brush mattress can provide immediate protection with live or dead material. Conifer branches can be used in forested areas with low sunlight. Brush mattress can withstand high runoff velocities.

Report Sources:

Prunuske Chatham, Inc. Brush Mattress Standard Detail. 1997.

USDA Natural Resource Conservation Service. “Streambank and Shoreline Protection.” Engineering Field Handbook. 1996.

California Department of Fish and Game. California Salmonid Stream Habitat Restoration Manual. 1996.

Additional Information:

Schiechtl, H.M., and R. Stern. Water Bioengineering Techniques for Watercourse Bank and Shoreline Protection. 1994.

Schiechtl, H.M. Bioengineering for Land Reclamation and Conservation. 1980.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Riley, A. Restoring Streams in Cities. 1998.

Erosion Control Practices Fact Sheet
Compost Soil Amendment and Mulch

Caltrans
New Technology Report

Description:

Composted materials are typically yard trimmings and other plant materials that have undergone thermophilic decomposition and organic matter stabilization. Their use includes rebuilding the soil biota to enhance plant growth, providing slow-release nutrients, preventing crusting, retaining moisture, controlling rainfall impact erosion and dust, and preventing critical area compaction. A typical surface amendment application is 75 to 100 mm deep.

Keywords: Soil amendment, mulch.

Compost Soil Amendment and Mulch

Erosion Control Function:

Erosion is reduced by compost's enhancement of plant growth, buffering of rainfall impact, and enhancement of soil structure. 40% to 50% estimated relative erosion/sediment control effectiveness.

Caltrans BMP ID
M

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Special Provisions

Effectiveness:

Low

Confidence Level in Effectiveness Rating
Low

Notes:

See Caltrans' Standard Special Provisions Section 10-1, #07-380A 07-30-99 or later. Caltrans and the California Integrated Waste Management Board are evaluating two materials: Green Materials Composts (GMC) and Co-Composted Materials (CCM).

Design Elements:

Interim Caltrans Specification for Compost (Classen, 2000): Compost shall be derived from green material such as chipped, shredded, or ground vegetation; clean, processed, recycled wood products; Class A, exceptional-quality biosolids compost, as required by USEPA regulations (40 CFR, Part 503c); or a combination of green material and biosolids compost. Compost shall be processed to reduce weed seeds, pathogens, or deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides, or other chemical residues that would be harmful to plant or animal life. Plastic, glass, metal, or rocks shall not exceed 0.1% by weight or volume. A min. internal temp. of 57 C shall be maintained for at least 15 continuous days during the comp osting process. Compost shall be thoroughly turned a min. of 5 times and go through a min. 90-day curing period after the 15-day thermophilic composting process has been completed. Compost shall be screened through a maximum 6 mm screen.

Ancillary Facilities:

Disperse or divert stormwater run-on away from freshly graded areas and into stable structures or channels. May require a specialized compost blower.

Specifications:

Climate Zone
Valley
Coastal
Mountain
Desert

Location
Urban
Rural

Soil Category
Rocky
Not rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Low

Applications may be $2,000 to $3,000 per ha.

Issues and Concerns

Maintenance:

Requirements

Inspect weekly or biweekly during the rainy season. Repair rills by raking soil on contour and mulching. Divert concentrated run-on.

Staffing/Equipment

Hand labor and hand tools.

Project Development:

Construction

May require dump truck, loader, wheelbarrows, rakes, or compost blower. Must pass the following tests when material is delivered-moisture content between 35-40% as determined by Calif. Test 226.Test for maturity and stability with Solvita test kit; shall measure a min. of "6" on the maturity/stability scale. Screen size and maturity/stability measurement may change, depending on the intended use of the compost. Use larger particle sizes (>19 mm screen) for steeper slopes.

Construction Complexity Low

Constraints

Application of compost within the dripline of established trees may cause increased fungal rot in some cases. In flood-prone areas, there may be a significant float-off of compost. Materials must be fully composted to prevent weed seed germination. Materials sampling and testing are mandatory.

Advantages

Multiple benefits, including protection of slopes from rainfall impact, improvement in soil structure, and increased plant germination and growth. Relatively inexpensive.

Report Sources:

Claassen, Vic. Use of Compost and Co-Compost as a Primary Erosion Control Material. Prepared under a grant funded by Caltrans and the Integrated Waste Management Board. January, 2000.

International Erosion Control Association. How to Select, Install and Inspect Construction Site Erosion and Sediment Control BMPs for NPDES Storm Water Permit Compliance. September, 2001.

Erosion Control Pilot Study, Caltrans, June 2000, CTSW-RT-00-012

Caltrans Standard Special Provisions. 1999. http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/99-SSPs/.

Prunuske Chatham, Inc. 2002.

Additional Information:

Keating, Janis. “Compost Coverage.” In: Erosion Control Journal. May/June, 2001.

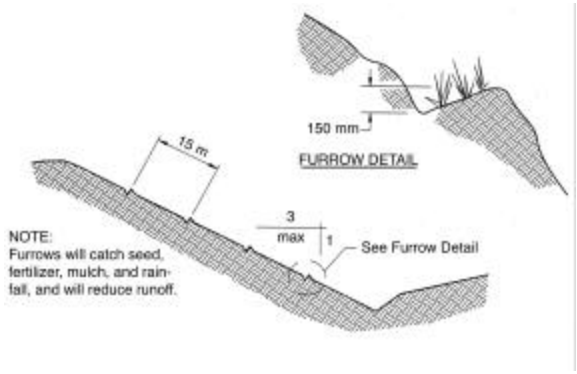
Caltrans Erosion Control Contractors and Material Suppliers Partnering Meeting. June 14, 2001.

Erosion Control Practices Fact Sheet
Contour Furrows

Caltrans
New Technology Report

Description:

A surface roughening technique used to interrupt continuous slope surfaces by creating small furrows 150 mm deep and up to 15 m apart on cut or fill slopes up to 1v:3h. Furrows break up the slope length, reduce runoff velocity, and provide niches for plant establishment.



Contour Furrows

Erosion Control Function:

Surface roughening is intended to aid the establishment of vegetative cover from seed, reduce runoff velocity, increase infiltration, reduce erosion, and trap sediments. Originally described in Caltrans' Construction Contractor's Guide and Specifications CD35(2). See also, Furrow Planting.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating

Medium

Notes:

Caltrans BMP ID

STS

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Approved Case by Case

Design Elements:

Slopes must be 1v:3h or less. Surface of finished grade must be loose and uncompacted to a minimum depth of 100 mm. Furrow locations must be placed on contour. Vertical cut distance should be less than the horizontal distance, and the horizontal surface of the furrow should slope slightly down toward the cut face.

Ancillary Facilities:

Staging areas and access for equipment.

Specifications:

Climate Zone

Valley
Desert
Mountain
Coastal

Location

Rural
Urban

Soil Category

Not rocky
Rocky

Aspect

N/A

Steepness

Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance:

Requirements

Inspect weekly or biweekly during the rainy season. Repair rills by raking soil on contour and mulching. Divert concentrated run-on.

Staffing/Equipment

Hand labor and hand tools.

Project Development:

Construction

Can be implemented with a tractor or by hand for small areas. Use a backhoe or excavator for broad slope areas.

Construction Complexity Low

Constraints

Surface must be non-compacted, and the practice is not recommended for slopes steeper than 1v:3h.

Advantages

Relatively simple technique for use on suitable sites. Breaks up slope distance and provides niches for plant establishment.

Report Sources:

Caltrans. Project Planning and Design Guide. Caltrans Storm Water Quality Handbooks. May, 2000.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Additional Information:

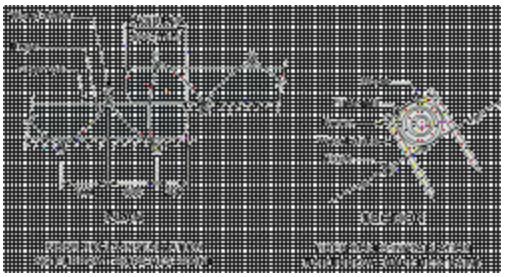
Erosion Control Practices Fact Sheet

Fiber Roll Anchoring with Rope Restraint

Caltrans
New Technology Report

Description:

Technique for installation of straw fiber rolls involves alternate side staking, crossover rope ties, and cinching to the ground. Creates tight contact with slope without disturbing soil.



Fiber Roll Anchoring with Rope Restraint

Erosion Control Function:

Retains soil on slopes by providing frequent on-contour slope breaks. Provides niche for permanent plant establishment. Replaces Caltrans old working details CD43 (2).

Caltrans BMP ID
SC5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Design Elements:

Fiber roll (straw, coir, excelsior, or other biodegradable material), wood stakes, and rope. Need to know slope and slope length to determine frequency of fiber roll installation. Soil mu st be smoothed on contour at point of roll installation. Contour lines must be established using a leveling device. Spacing should be determined by project engineer.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

HQ OSLA has approved this alternative anchoring system for specific projects on an exception basis.

58% effective.**

Ancillary Facilities:

Slope preparation required for a smooth slope surface. To be used with seed and mulch. Install prior to application of seed and mulch. No specialized equipment or labor required, but contour lines must be established using a leveling device.

Specifications:

Climate Zone
Valley
Desert
Mountain
Coastal

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max 1v:1h

Cost: Low

Installed fiber rolls: $7.50 to $15 per linear meter.*

Erosion Control Practices Fact Sheet
Fiber Roll Anchoring with Rope Restraint

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect weekly during rainy season to ensure it is not being undercut. Correct rills and bypasses with hand tools.

Staffing/Equipment

Small hand crew with shovels and sledges.

Project Development:

Construction

Simple installation using fiber rolls (straw, coir, excelsior, or other biodegradable material), wood stakes, and rope. Smooth ground before installation. Install on contour. Straw rolls must be placed on contour and secured tightly to the ground in order to prevent undercutting or water concentration. Rolls must be securely butted together or overlapped. Spacing between contour rolls is closer with increasing slope steepness and on sandy or other highly erodable soils.

Construction Complexity

Low

Constraints

Spacing should be determined by project engineer. May cause slope saturation from increased infiltration on some slopes with tight soils.

Advantages

This practice provides an alternative anchoring method that does not require furrowing as part of the installation. The furrowing method is not always feasible on steep slopes as it can jeopardize slope integrity if done incorrectly.

Report Sources:

David Yam, Caltrans District 4. Personal communication, 2001. David_Yam@dot.ca.gov.

Additional Information:

* McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

** Erosion Control Pilot Study, Caltrans, June 2000, CTSW-RT-00-012

Erosion Control Practices Fact Sheet
Fiber Soil Reinforcement

Caltrans
New Technology Report

Description:

Engineered, 2.5 mm to 5 mm-long, polypropylene fibers are mixed into the soil to increase the strength of the soil mass. Polypropylene fibers consist of fibrillose, UV-stabilized strands that open or filamentize into net, grid, and fiber configurations when mixed with soil.

Keywords: Soil amendment.

Fiber Soil Reinforcement

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill

Status
Not Approved

Erosion Control Function:

Fiber Soil Reinforcement functions as an artificial root mass. Once plants are established, improved cover and soil structure reduce runoff and sediment transport.

Design Elements:

Issues including steepness of slope, hydrology, distance for blowing fibers need to be considered. The manufacturer prescribes a dosage of 0.1% to 0.3% of the soil's dry unit weight. Typical application is to blend the fibers into the soil matrix with a rototiller at a rate of 3.2 kg fibers per meter^3 of soil.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
High

Notes:

Tested at Colorado State University Hydraulics Laboratory.

Ancillary Facilities:

May require hydromulch, straw, erosion control blankets, or turf-reinforced mat to increase effectiveness on steeper slopes or within channels.

Specifications:

Climate Zone
Mountain
Coastal
Desert
Valley

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Medium

$4.41/kg for materials.

Issues and Concerns

Maintenance:

Requirements

Inspect weekly in winter for slope instability. Typically, redirect water from rills, fill rills with soil, compact, and secure with erosion control blanket.

Staffing/Equipment

Hand tools.

Project Development:

Construction

Patented products are required. May require rototiller, blower, cement mixer, modified broadcaster.

Construction Complexity Low

Constraints

Fibers can be blown onto soil prior to tilling but only for short distances. Difficult to incorporate fibers into soil on steep slopes with rototiller. If topsoil is imported, fibers can be mixed with soil in a cement mixer, which would add to construction time. Even distribution of fibers is difficult to confirm. Does not protect soil surface.

Advantages

An invisible way to increase fiber content in soils on fill slopes. When combined with revegetation and surface protection using mulch and erosion control blankets, practice helps stabilize slopes. Fibers readily blend into the landscape.

Report Sources:

Pace, Frank P., "Increasing Unvegetative Performance with Fiber Reinforcement." In: Proceedings of International Erosion Control Association Conference 32. February, 2001.

Synthetic Industries, makers of GeofibersTM. http://www.sigeosolutions.com.

Additional Information:

Pace, Frank P., "Increasing Unvegetative Performance with Fiber Reinforcement." In: Proceedings of International Erosion Control Association Conference 32. February, 2001.

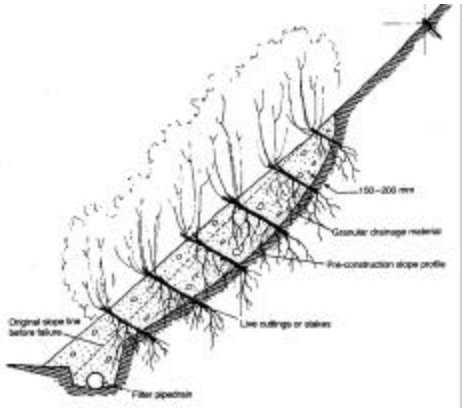
Synthetic Industries makers of GeofibersTM. http://www.sigeosolutions.com.

Erosion Control Practices Fact Sheet
Filter Wedge

Caltrans
New Technology Report

Description:

Gravel or permeable material is installed in layers at the base of slope with live, rootable branches placed in layers or individually through the fill material extending into the original slope. Used to stabilize and fill slides on saturated slopes. Keywords: Bioengineering, upslope.



Filter Wedge

Erosion Control Function:

Reduces erosion risk and sediment transport by creating a thick filter over unstable, saturated slopes.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating

Low

Notes:

Should be field-tested and evaluated.

Caltrans BMP ID

PSP

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Geotechnical and hydrologic concerns must be addressed. Subsurface drains may be needed at base of slope. Slope may be seeded and topsoiled. South-facing slopes may require irrigation for establishment.

Ancillary Facilities:

Can be used with pole planting or brush layering practices. Subsurface drains may be needed at base of slope.

Specifications:

Climate Zone

Valley
Coastal
Mountain

Location

Urban
Rural

Soil Category

Not rocky

Aspect

West
East
North

Steepness

Max 1v:1h

Cost: Medium

Issues and Concerns

Maintenance:

Requirements

May need temporary irrigation in some locations and if used on south-facing slopes.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Loader, excavator, or backhoe; trucking for gravel installation. Hand crew for plant installation.

Construction Complexity Medium

Constraints

Rocky slopes below wedge may limit installation of live branches. Dry slopes may not support rooting of branches. Not applicable for stabilizing slopes steeper than the natural angle of repose. South-facing slopes may require irrigation for establishment.

Advantages

Economical construction method. Natural appearance.

Report Sources:

Schiechtl, H.M., and R. Stern. Ground Bioengineering Techniques for Slope Protection and Erosion Control, 1996.

Additional Information:

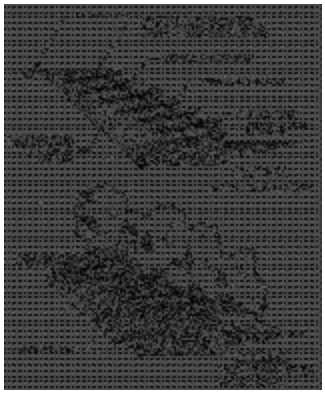
Erosion Control Practices Fact Sheet

FREF (Fabric Reinforced Earth Fill) with Brush Layers

Caltrans
New Technology Report

Description:

Fabric Reinforced Earth Fill (FREF) with Brush Layers, also known as the "Vegetated Geogrid" (R. Sotir), is used for reconstruction of steep fill slopes or streambanks. It is similar to the Brush Layering practice with live brush cuttings installed perpendicular to slope contours on constructed fill benches. The face of each compacted soil lift is wrapped (encapsulated) by geotextile grids or natural (coir) fiber mats. The fabric provides immediate erosion control between brush layers and, with root development, creates a strong interlocking matrix that enhances slope stability.
Keywords: Bioengineering, upslope, waterway.



FREF with Brush Layers

Erosion Control Function:

Surface erosion (rain drop, sheet, and rill) is substantially reduced immediately following installation if erosion contol blankets are incorporated in the face of each wrapped lift. Vegetation also acts as a coarse sediment filter immediately after installation. Root structure mechanically reinforces the soil by increasing shear strength. Protects against shallow slides and mass wasting.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

The strongest biotechnical slope stabilization technique that does not incorporate hard engineering structures.

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill

Status
Approved Case by Case

Design Elements:

Maximum slope gradient of 1:1 is recommended. 1v:0.5h has been used in extreme cases for slope tie-ins to natural grades. Geotechnical and hydrologic conditions must be evaluated. Subsurface drains may be needed on dense soil types. Drip or overhead irrigation can be used for brush establishment. Fabric tensile strength and coarseness need to match application conditions. Use of natural, biodegradeable fabrics vs. long-lasting geotextiles should be weighed. Typical encapsulated lifts range from 0.3 m to 0.6 m. Topsoiling may be used between lifts. Must have solid footing.

Ancillary Facilities:

Temporary sediment control facilities at bottom of slope during construction. Drip irrigation in some locations. Brush layering techniques for fill slopes. Erosion control blankets and compacted fill specifications should be followed. Temporary water-holding capability for brush storage. Dump trucks and imported soil may be required.

Specifications:

Climate Zone
Mountain
Coastal
Desert
Valley

Location
Urban
Rural

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
< 1v:1h
Max 1v:1h

Cost: High

Erosion Control Practices Fact Sheet — Caltrans

FREF (Fabric Reinforced Earth Fill) with Brush Layers — New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect during wet season for slips, rilling, or small gully formation. Inspect frequently for slope instability during wet season. Inspect during dry season for plant establishment and soil moisture.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Excavator or dozer. Loader for fill. Dump trucks and imported soil may be required. Large hand crew for brush harvesting and fabric installation. Water for brush storage.

Construction Complexity

High

Constraints

Unsuitable for rocky slopes, slopes over 1:1, or slopes with no equiptment access. Must have solid footing. May require reconstructed rock footing in stream environments. Limited overland flow dependent on fabric type. Needs brush cuttings with adventitious rooting ability. Rooting and establishment of brush may be less successful if installed during dry season or without irrigation. Temp. irrigation may be required during establishment period, particularly during first dry season and on south-facing slopes.

Advantages

Provides immediate erosion control from fabric and slope reinforcement from unrooted brush and horizontal geotextiles. As roots develop, improves slope stability and shear resistance by creating a rooting matrix with geogrids throughout structural lifts. Creates slope breaks that shorten slope length and reduce runoff velocities. Creates vegetative filters for debris. Increases infiltration rates on dry sites. Acts as horizontal drain on wet sites. Allows for vegetative establishment, cover, and natural recruitment. Creates immediate water quality improvements. Can be modified for use in small drainages for nickpoint/ headcut stabilization by hand crews.

Report Sources:

Robbin Sotir and Associates.

Prunuske Chatham, Inc. FREF with Brush Layers Standard Detail. 2001.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Additional Information:

Gray, D.H., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

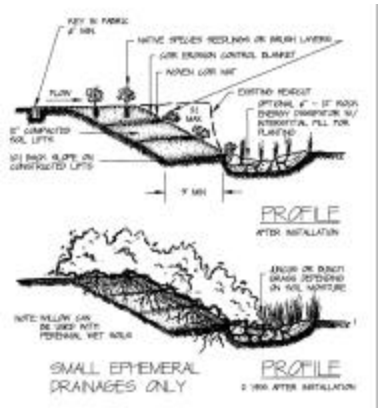
Erosion Control Practices Fact Sheet
FREF Headcut Repair with Brush Layers

Caltrans
New Technology Report

Description:

Fabric Reinforced Earth Fill (FREF) with Brush Layers can be modified to stabilize nickpoints or headcuts at the top of gullies and small ephemeral streams. The nickpoint is excavated, and the spoils are used to create a spillway constructed of compacted soil lift encapsulated by geotextile grids or natural (coir) fiber mats. The fabric provides immediate erosion control between brush layers and, with root development, creates a strong interlocking matrix that provides grade control. Rock energy dissipators are recommended.

Keywords: Bioengineering, waterway.



FREF Headcut Repair with Brush Layers

Erosion Control Function:

Used to stop the upstream advancement of downcutting gullies by stabilizing the nickpoint or headcut. Controlling channel incision will also protect banks from becoming destabliized due to undercutting of the toe. Encapsulated soil prevents a substantial amount of soil detachment and mass wasting within a downcutting gully or small ephemeral stream. Vegetation acts as a coarse sediment filter from upstream flow.

Effectiveness:

High

Confidence Level in Effectiveness Rating

Medium

Notes:

This application has had good success in Sonoma, Marin and Monterey counties.

Caltrans BMP ID

PSP

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Drainage area and peak flows must be determined. Channel profile should be surveyed. Long-lasting geotextiles or coir twine mats with a 3- to 5-year life span can be used. In addition, a dense coir erosion control blanket should be used for sandy and silty soils.

Vegetation selection is critical for longevity of repair. Willow brush can be used in wet seeps, or rooted Bacharris spp. can be used in mesic environments. Fabric must be keyed in at upstream end of the project, and an apron of brush or rock should be installed for energy dissipation.

Ancillary Facilities:

Staging area may be required if equipment is used. May reqiuire temporary irrigation on south-facing slopes or dry areas. Rock energy dissipators are recommended.

Specifications:

Climate Zone

Mountain
Coastal
Desert
Valley

Location

Rural

Soil Category

Not rocky

Aspect

North
East
South
West

Steepness

Max 1v:1h

Cost: Medium

Erosion Control Practices Fact Sheet
FREF Headcut Repair with Brush Layers

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Check for rips or holes in the fabric. Patch fabric as necessary. Check for plant vigor. Temporary irrigation might be required in drought areas. Check stability after significant runoff events and during summer for plant establishment (1 to 3 years).

Staffing/Equipment

Hand crew. Staples, fabric for patching, hammers, shovel, pruners.

Project Development:

Construction

Can be constructed by hand crews or aided by an excavator or backhoe. Cut and fill should be balanced. Harvest brush or use rooted nursery material.

Construction Complexity Medium

Constraints

Not recommended for streams with large drainage areas or streams with coarse bedload. Should be installed before the wet season. Not recommended for areas with livestock access (hoof damage). Vegetation could impede flow on larger streams, leading to bank cutting around plant growth. This is not a problem in small drainages.

Advantages

An inexpensive, low impact, and effective practice that provides long-term grade control for downcutting gullies and small drainages. Can be constructed by hand crews. Ideal for areas with poor access. Balances cut and fill.

Report Sources:

Prunuske Chatham, Inc. FREF Headcut Repair with Brush Layers Standard Detail. 2001.

Additional Information:

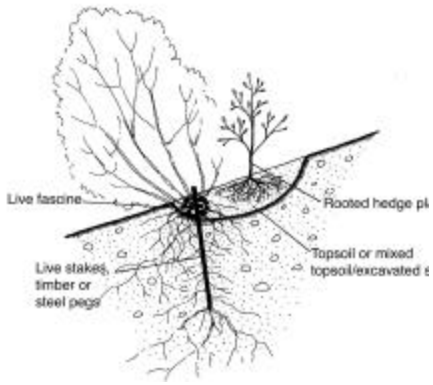
Erosion Control Practices Fact Sheet
Furrow Planting

Caltrans
New Technology Report

Description:

Furrows 0.3 m to 1.0 m wide and approximately 300 mm deep are excavated across the slope and then backfilled with topsoil and compost. A thin, live willow fascine is placed at the downslope end of the furrow and staked down. At the upslope end of the furrow, young rooted plants of suitable shrubs or trees are installed 0.5 m to 1.0 m apart. Furrows create a planting bed for colonizing vegetation while fascines stabilize slopes with fast growing pioneer species.

Keywords: Bioengineering, upslope.



Furrow Planting

Erosion Control Function:

Can help trap sediment and debris and prevent soil entrainment by breaking up the slope length and dissipating energy. As fascines and rooted seedlings sprout, additional filtering, trapping, and soil anchoring benefits are enhanced.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating

Low

Notes:

Caltrans BMP ID

PSP

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Should be installed at 10 to 30 degrees from horizontal to direct surface flow. Can be designed on contour for permeable soils to increase infiltration. Geotechnical and hydrologic conditions must be considered. Furrow width and depth can be modified to alter planting bed dimensions, increasing furrow size with increasing slope steepness. Usually utilized on slopes flatter than 1v:3h, with 1v:2h being the extreme limit. Best used on relatively flat, poorly drained, or wet slopes in climatically favorable areas.

Ancillary Facilities:

Practices commonly used with furrow plantings include fascines, topspoiling, live staking, micro soil nailing, seeding, and mulch.

Specifications:

Climate Zone

Mountain
Coastal
Valley

Location

Rural
Urban

Soil Category

Not rocky

Aspect

West
South
East
North

Steepness

Max. 1v:2h

Cost: Medium

1 to 3 m can be constructed per person hour.

Erosion Control Practices Fact Sheet
Furrow Planting

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspection and maintenance are required during the first year at a minimum. Check stakes and fascines for tightness and rilling. Repair by hand as needed.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Hand crew. Excavator if access is good.

Construction Complexity Medium

Constraints

Labor intensive. For use only on gentle slopes up to a maximum of 1v:2h. 1v:3h or less is optimal. Not suitable for rocky conditions. Topsoil or compost are required. Must be installed so furrows can drain. Inappropriate for heavy, low-permeability soils.

Advantages

Correct plant selection allows for the establishment of pioneer and subsequent colonizing vegetation. Drains wet slopes, breaks up slope length, dissipates energy, traps sediments and debris on slope, and creates a small terrace for native plant recruitment. Can stabilize slope surfaces. Fascines sprout and establish roots for increased slope stability.

Report Sources:

Schiechtl, H.M., and R. Stern. Ground Bioengineering Techniques for Slope Protection and Erosion Control. 1996.

Additional Information:

Schiechtl, H.M. Bioengineering for Land Reclamation and Conservation. 1980.

Erosion Control Practices Fact Sheet
Land Imprinting

Caltrans
New Technology Report

Description:

Land imprinting, also known as soil imprinting, is a no-till method of surface roughening for establishing grasses. A roller with steel teeth creates V-shaped imprints or indentations that funnel rainwater, seed, and soil together in the low areas. Imprints are about 250 mm long, V-shaped troughs, staggered and separated by 50 mm wide dikes at the soil surface. Imprint depth is 100 to 150 mm.

Land Imprinting

Erosion Control Function:

Imprints create a microclimate for grass establishment. Land imprinting increases rate, duration, and volume of infiltration to the location where seeds are concentrated at the bottom of the vee. It helps restore degraded soil structure and decreases soil loss 76% compared to bare soil.

Caltrans BMP ID
STS

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Design Elements:

Avoid tillage before imprinting. If soil is heavily compacted, ripping is preferred to discing. The load-bearing capacity of the soil must be calculated to determine the imprinting force required. Tooth size and spacing can be selected to fit local conditions.

Effectiveness:

High

Confidence Level in Effectiveness Rating
High

Notes:

Developed in the southwest by the USDA and refined by the Imprinting Foundation. Tested by Caltrans.

High effectiveness.*

Ancillary Facilities:

Specialized imprinting tool required. Broadcast seeding is done in conjunction with imprinting. Divert run-on away from freshly graded areas and into stable structures or channels. Mulch steeper slopes.

Specifications:

Climate Zone
Desert
Valley

Location
Rural

Soil Category
Not rocky

Aspect
N/A

Steepness
Max. 1v:3h

Cost: Low

$62 to $1,235 per hectare.

Issues and Concerns

Maintenance:

Requirements

Inspect weekly or biweekly during the rainy season. Repair rills by restoring contour and mulching. Divert concentrated run-on.

Staffing/Equipment

Hand labor and hand tools.

Project Development:

Construction

Specialized equipment required. Tractor or bulldozer pulls a heavy roller with specially designed steel teeth.

Construction Complexity Low

Constraints

May not be appropriate for heavy (clay) soils that may become compacted. Not feasible on overly steep slopes, although some specialized equipment has been developed. Imprints longer than 250 mm can lead to rill and gully formation.

Advantages

Simple method of faciliting plant establishment, especially in arid soils. Does not invert soils.

Report Sources:

Dixon, R.M., and Ann B. Carr. “Land Imprinting Specifications for Ecological Restoration and Sustainable Agriculture.” In: International Erosion Control Association Proceedings of Conference 31. February, 2000.

* Caltrans, Erosion Control Pilot Study, CTSW-RT-00-012, June 2000.

Additional Information:

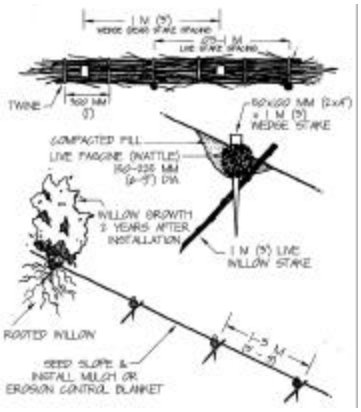
Bainbridge, David. “Soil Shaping to Improve Native Grass Establishment.” In: Grasslands. A publication of the California Native Grass Association. Fall, 2000.

Erosion Control Practices Fact Sheet
Live Fascines (Wattles)

Caltrans
New Technology Report

Description:

Live fascines, often referred to as willow wattles, are bundles of live cuttings bound together by rope into cylinders and used for slope stabilization. The bundles of live cuttings (usually willow) are installed in shallow trenches and staked down on contour for dry slope infiltration or at an angle for wet slope drainage. Live fascines reduce surface slope erosion by breaking up slope length, reducing runoff velocity, trapping sediments, and promoting vegetation establishment. Live fascines can be used for slope drainage in conjunction with pole or fascine drains. They can be used with brush layering for enhanced soil stabilization. Can be used as keys for erosion control blanket installation.
Keywords: Bioengineering, upslope, waterway.



Live Fascines

Erosion Control Function:

This practice helps trap sediment and debris; it also prevents soil entrainment by breaking up the slope length and dissipating energy. As fascines sprout, additional filtering, trapping, and soil anchoring benefits are enhanced.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating

Medium

Notes:

Caltrans BMP ID

PSP

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Geotechnical and hydrologic conditions must be evaluated. Fascines can be designed to increase slope infiltration for relatively dry slopes or designed for slope drainage on wetter sites when installed at an angle to the slope. Ideal for cut slopes; can be used on fill slopes. Fascine spacing is shortened with increasing slope steepness.

Ancillary Facilities:

Seed and mulch are commonly required between fascines.

Specifications:

Climate Zone

Valley
Coastal
Mountain

Location

Rural
Urban

Soil Category

Not rocky

Aspect

West
East
North

Steepness

Max 1v:1h

Cost: Medium

0.5-1.0 m/person hour.

Erosion Control Practices Fact Sheet
Live Fascines (Wattles)

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspection and maintenance required during the first year at a minimum. Check stakes and wattles for tightness and rilling. Inspect frequently for slope instability during wet season. Typically, redirect water from rills, fill rills with soil, compact, and secure with erosion control blanket. May require periodic irrigation, depending upon date of installation.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Hand crew. Fascines are typically constructed out of small-sized (<2.5 cm) plant material with all the branches bundled together in the same direction for increased drainage. Wattles are constructed with the branch butt ends and tips alternating in direction.

Construction Complexity

Medium

Constraints

Plants should be harvested and installed during dormancy in late fall through late winter. Wattles placed on contour can increase infiltration and cause increased saturation on slopes, which may lead to slope failure. Fill slopes are more at risk than cut slopes. Interstitial soil fill can reduce risk of failure. If not spaced close enough, rilling is more likely.

Advantages

Can be installed on contour for increased infiltration and/or on a slight gradient for slope drainage. Live fascines break up slope length, dissipate energy, trap sediments and debris on slope, and create a small terrace for native plant recruitment. They can stabilize slope surfaces and will sprout and establish roots, thus increasing slope stability. Project steepness in applications have ranged from 1v:5h to 1:1.

Report Sources:

Kraebel, C.J. “Erosion control on mountain roads.” USDA Circular No. 380. 1936.

Bentrup, Gary, and J. Chris Hoag. The Practical Streambank Bioengineering Guide. User's Guide for Natural Streambank Stabilization Techniques in the Arid and Semi-arid Great Basin and Intermountain West. United States Department of Agriculture Natural Resources Conservation Service. 1998.

Lewis, Lisa. Soil Bioengineering: An Alternative for Roadside Management. A Practical Guide. USDA Forest Service. 2000.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Gray, D.H., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Schiechtl, H.M. Bioengineering for Land Reclamation and Conservation. 1980.

Gray, D.H., and A.T. Leiser. Biotechnical Slope Protection and Erosion Control. 1982.

Prunuske Chatham, Inc. Live Fascines (Wattles) Standard Detail. 2001.

Additional Information:

Gray, D.H., and A.T. Leiser. Biotechnical Slope Protection and Erosion Control. 1982.

Schiechtl, H.M., and R. Stern. Ground Bioengineering Techniques for Slope Protection and Erosion Control. 1996.

Lewis, Lisa. Soil Bioengineering: An Alternative for Roadside Management. A Practical Guide. USDA Forest Service. 2000.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

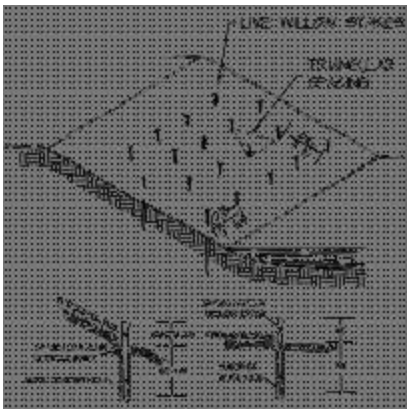
Erosion Control Practices Fact Sheet
Live Staking

Caltrans
New Technology Report

Description:

Live staking involves the insertion of live vegetative cuttings into the ground that will root and grow. A system of stakes creates a living root mat that stabilizes the soil by reinforcing and binding soil particles together and by extracting excess soil moisture. Willow, cottonwood, or dogwood can all be used for this technique.

Keywords: Bioengineering, upslope, waterway.



Live Staking

Erosion Control Function:

Once plants are established, improved cover and soil structure reduce runoff and sediment transport.

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Design Elements:

Water table must be considered. Stakes can be planted close together in highly erodible areas. Live stake material should be fast-growing pioneer species. Successional species should be incorporated into planting plan. Stakes range from 0.75 to 1.5 m in length and 20 to 40 mm in diameter.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Ancillary Facilities:

Stakes can be used to fasten live fascines, straw wattles, and erosion control blankets. Can be planted through rock riprap (joint planting) or installed during construction of rock slopes with interstitial fills.

Specifications:

Climate Zone
Mountain
Coastal
Valley

Location
Rural

Soil Category
Not rocky

Aspect
West
East
North

Steepness
Max. 1v:2h

Cost: Medium

25-40 stakes per hour.

Issues and Concerns

Maintenance:

Requirements

May need browse protection (sleeves) in areas with large deer populations. Establishment period watering in areas with low water tables may be needed.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Live stakes can be installed by driving a pilot hole with a stone bar, rebar, or water jet. In soft soils, stakes can be driven with a mallet.

Construction Complexity Low

Constraints

Live stakes should be planted during the dormant season, with plant material derived from local sources. Low groundwater table or dry slopes may reduce survival.

Advantages

Easy to install. Fast vegetative growth allows for invasion of other native species. Can be used to secure other surface erosion control materials. Can be used in between as filler or in combination with other biotechnical repairs.

Report Sources:

Sotir, Robbin B., and Donald H. Gray. “Soil Bioengineering for Upland Slope Protection and Erosion Reduction.” Engineering Field Handbook. Chapter 18. USDA Natural Resource Conservation Service. 1992.

Prunuske Chatham, Inc. Live Staking Standard Detail. 2001.

Additional Information:

Sotir, Robbin B., and Donald H. Gray. “Soil Bioengineering for Upland Slope Protection and Erosion Reduction.” Engineering Field Handbook. Chapter 18. USDA Natural Resource Conservation Service. 1992.

USDA Natural Resource Conservation Service. The Practical Streambank Bioengineering Guide. 1998.

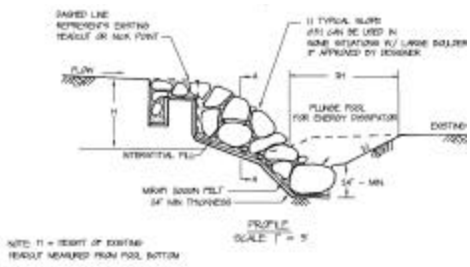
Prunuske, L. Groundwork. Marin County Resource Conservation District. 1987.

Erosion Control Practices Fact Sheet
Loose Rock Headcut Repair

Caltrans
New Technology Report

Description:

An engineered rock structure for grade control. Used to stabilize nickpoints or headcuts at the top of gullies and small intermittent streams. Two methods are common for loose rock headcut repairs. The nickpoints can be excavated back and a rock channel with a toe can be installed, or the headcut can be filled in place creating a rock channel with a toe. Rock is carefully placed and installed on a geotextile fabric. Interstitial fill is recommended to keep runoff flowing on top of rock. Keywords: Bioengineering, waterway



Loose Rock Headcut Repair

Erosion Control Function:

Used to arrest the upslope advance of headcutting gullies. Prevents soil detachment and mass wasting within a downcutting gully or small intermittent stream.

Caltrans BMP ID
HS

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Design Elements:

Watershed size and expected peak flow rates must be calculated to determine rock size. The headcut may need to be reshaped to allow for correct installation of geotextile, rock, and coir mat. Rock interstices are filled with smaller material. Coir mat is used at leading edge and over the first rocks to direct water over rocks. The coir acts as a substrate for colonizing vegetation. Rocks must be carefully placed with three points of contact. Use non-woven geotextile underneath with coir mat at leading edge.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Excellent retrofit potential for gully erosion.

Ancillary Facilities:

Staging area for small equipment and rock. Contributary areas may need surface protection by hydromulch, planting, or erosion control blanket.

Specifications:

Climate Zone
Valley
Desert
Mountain
Coastal

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Medium

Erosion Control Practices Fact Sheet
Loose Rock Headcut Repair

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Rock adjustment is usually required over the first and second winters. Inspect prior to onset of rainy season, monthly during winter, and after major storms.

Staffing/Equipment

Rock adjustment usually can be done by hand, although more substantial adjustment may require a loader and excavator.

Project Development:

Construction

Excavator or backhoe for rock placement and excavation. Proper keying of geotextile and coir mat is critical. Proper placement of rocks to lock in place is required for proper function.

Construction Complexity Medium

Constraints

For larger projects, good access for heavy equipment is required. Rock size must be calculated based on contributing watershed and anticipated peak flows.

Advantages

Provides immediate grade control for downcutting gullies and minor drainages. The porosity and flexibility of the rock structure reduce chance of failure from piping and settling common to concrete structures. Rock and interstitial fill may support colonizing vegetation as soil accumulates in rock spaces. Once gully downcutting is controlled, slopes can be revegetated, or other biotechnical repairs can be installed.

Report Sources:

Prunuske Chatham, Inc. Loose Rock Headcut Repair Standard Detail. 2001.

Additional Information:

Erosion Control Practices Fact Sheet

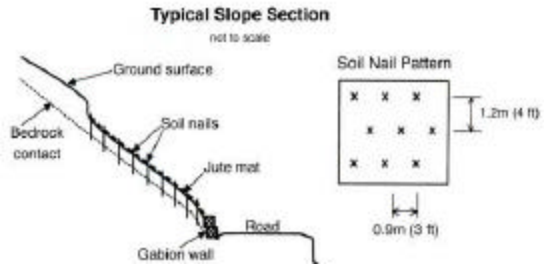
Micro Soil Nailing

Caltrans
New Technology Report

Description:

Micro soil nails are 1.1 m long #4 steel rebar or "allthread" driven to 0.15 m above ground on a 1.2 x 0.9 m spacing. The 15 cm above ground is used to reinforce the top 1 m of soil as well as anchor logs, fiber rolls, or other surface slope breaks. The soil nails can also be used to anchor the rolled erosion control fabric product. On steep cut slopes, micro soil nails act as "pseudo roots."

Unlike typical soil nail walls, which are engineered earth-retaining systems that use long steel rods coated with epoxy or encapsulted within a grout-filled plastic sheath, micro soil nailing utilizes smaller steel rods designed to stabilize shallow mass wasting.



Micro Soil Nails

Erosion Control Function:

Intended to arrest shallow mass wasting. Also provides anchoring for surface erosion control techniques.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut

Status
Not Approved

Design Elements:

Geotechnical information needed includes depth of failure, depth to slip plane, and soil texture. May need to engineer weighted toe protection/reinforcement. Rope, pulleys, climbing gear on very steep slopes.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating
Low

Notes:

In the referenced case study (Broda, 2001), depth to weak, weathered bedrock was 30 to 75 cm, soils were silty sand and silt, and slopes ranged from 85% to 115%. The one reference claimed the practice to be highly effective.

Ancillary Facilities:

May require toe protection with a gabion wall, boulders, or other structure, and surface protection with erosion control blanket. Backhoe/excavator for toe support structure if needed. Hand-held pneumatic hammer with custom-made sleeve to drive nails. Rope, pulleys, climbing gear on very steep slopes.

Specifications:

Climate Zone
Mountain
Desert
Valley
Coastal

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max 1v:1h
< 1v:1h

Cost: Medium

For a 1,160 m2 project with jute matting, steel rebars, staples, seeding and mulching, unit cost was $6.60/m2 installed = $66,000/hectare (1995 prices).

Issues and Concerns

Maintenance:

Requirements

Monitor weekly during winter and correct surface rilling. Typically, redirect water, fill rills, compact, and secure with erosion control blanket.

Staffing/Equipment

Two- to three-person team for repairs. Rope, pulleys, and climbing gear.

Project Development:

Construction

Backhoe/excavator for toe support structure if needed. Hand-held pneumatic hammer with custom-made sleeve to drive nails. Rope, pulleys, and climbing gear. Rebar or "allthread" with washer and nuts must be pre-cut and assembled.

Construction Complexity Medium

Constraints

Shallow, hard bedrock is not compatible with the micro soil nailing practice. Applicable to slopes where instability is confined to a relatively shallow depth. Protruding rods are hazardous in areas subject to foot traffic.

Advantages

Micro soil nails act as "pseudo roots" to form subsurface reinforcement. Useful on steep slopes with shallow soils where bioengineering methods alone are not sufficient to stop erosion. Nails can be used to anchor surface treatments such as erosion control blankets or wattles.

Report Sources:

Broda, Karel M., P.E. "Stabilization of Steep Slope with Micro Soil Nails." In: International Erosion Control Association 2001 Conference Proceedings.

Additional Information:

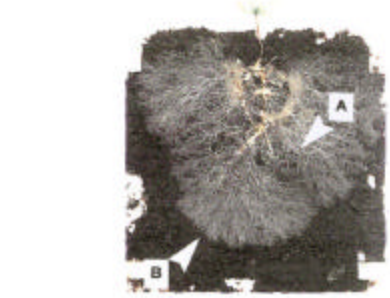
Broda, Karel M., P.E. "Stabilization of Steep Slope with Micro Soil Nails." In: International Erosion Control Association 2001 Conference Proceedings.

Erosion Control Practices Fact Sheet
Mycorrhizal Soil Inoculant

Caltrans
New Technology Report

Description:

Soil to be seeded with perennial cover is inoculated with the appropriate mycorrhizal species or mixtures in areas where functioning topsoil is not present (see Topsoiling). This practice is reported to reduce the need for fertilizer, with corresponding reduction in nutrient-laden runoff. It improves soil structure and target plant establishment.
Keywords: Soil amendment



A--Limitation of the natural root system on a young seedling.
B--Extended area penetrated by the mycelium network (mycon
from which moisture and nutrients can be absorbed.

Mycorrhizal Soil Innoculant

Erosion Control Function:

Improved cover and soil structure reduce runoff and sediment transport. Practice does not provide direct erosion control but rather improves soil productivity, thereby improving plant establishment and growth. Mycorrhizae may be a single species-specific inoculum or a mixture derived from soils within a plant community native to local conditions. Not required for healthy topsoils.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating

Low

Notes:

Suitable for establishment of perennial cover and native plant restoration projects. Standards need to be developed for guaranteed live innoculant. Not required for healthy topsoils.

Caltrans BMP ID

None

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Determine existing soil characteristics such as source (if imported), pH, and percent organic matter. Determine perennial species to be planted. Determine need for mycorrhizae, appropriate species mixture, and rate of application. Need to know surface area and soil type to determine application rates.

Incorporate dry powder inoculant at rates of 163.02 liter per hectare into seed bed or per manufacturer's specifications. Can be mixed with seed in a broadcaster or in hydroseed applications. Appropriate strains of fungi must be matched with the type of plants being established.

Ancillary Facilities:

May require straw mulch, hydromulch, erosion control blanket, or other cover during plant establishment period.

Specifications:

Climate Zone

Mountain
Coastal
Valley
Desert

Location

Rural
Urban

Soil Category

Not rocky
Rocky

Aspect

N/A

Steepness

< 1v:1h
> 1v:1h

Cost: Low

Less expensive than fertilizer. Typical rate of 67 kg per hectare. $12/kg materials cost.*

Erosion Control Practices Fact Sheet
Mycorrhizal Soil Inoculant

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect weekly during establishment period. Mulch and/or reseed and reinoculate areas that are showing a depressed rate of vegetation colonization or growth.

Staffing/Equipment

Small hand crew with hand tools.

Project Development:

Construction

Patented products are required. There are several manufacturers. Typically, hydroseeder, broadcaster, and/or tiller are required.

Construction Complexity Low

Constraints

Need to consult with mycorrhizae experts to determine correct species or mixtures and dosages. May not result in first season rapid growth such as occurs with annuals and application of high nitrogen fertilizer. Most inoculations perform better if adequate soil moisture is maintained. The shelf life of the inoculants is limited, and materials must be stored in cool, dry conditions.

Advantages

This practice reduces the need for fertilizer and increases the rate of establishment and growth. Well-established perennial plant cover generally results in less soil loss over the long term than traditional annual grass cover. Once established, a healthy mycorrhizae-inoculated stand of perennials is relatively resistant to weed invasion.

Report Sources:

Keating, Janis. “What's the Stink About Fertilizers?” In: Erosion Control. July/August, 2001.

RTI (vendor) http://www.reforest.com.

http://www.mycorrhiza.org.

* Pacific Coast Seed, Inc., Livermore, CA, 800-733-3462.

Additional Information:

Keating, Janis. “What's the Stink About Fertilizers?” In: Erosion Control. July/August, 2001.

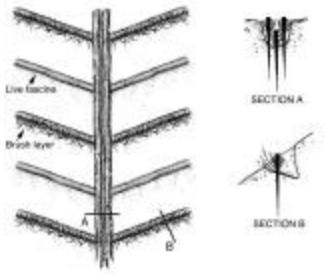
Plant Health Care, Inc.
http://www.planthealthcare.com/fungi.html.

Erosion Control Practices Fact Sheet
Pole Drains (Fascine Drains)

Caltrans
New Technology Report

Description:

Pole or fascine drains are bundles of long, straight, live cuttings (usually willow) bound together by rope into a cylinder and installed to control and direct slope drainage. The bundles are installed in shallow trenches and staked down at an angle for drainage of wet slopes. Runoff flows unimpeded along the parallel bundles. The drains can be installed to intercept excessive slope moisture from unstable areas and to help drain water into more stable areas or natural drainages. Pole or fascine drains can be used with brush layering for enhanced soil stabilization. Can be used as keys for erosion control blanket installation or with subsurface drains on extremely wet slopes.
Keywords: Bioengineering, upslope.



Pole Drains (Fascine Drains)

Erosion Control Function:

Reduces risk of shallow slope failure and erosion by draining excess mositure. As fascines and poles sprout, filtering and trapping benefits are enhanced.

Pole drains are longer, thicker cuttings than willow wattles (see Live Fascines). A combination of both can be used.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating
Low

Notes:

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Design Elements:

Geotechnical and hydrologic conditions must be considered. Pole drain spacing is critical in relation to slope gradient and runoff rates. Can be used in a “herring bone” pattern with collector drains and a central main drain built out of several fascines. Can be used in conjunction with subsurface drains. Angle trenches 20 to 45 degrees from contour. For use on 1v:5h to 1:1 slopes.

Ancillary Facilities:

Seed and mulch are commonly used between pole drains. Drainage rock may be necessary in sandy soils.

Specifications:

Climate Zone
Mountain
Coastal
Valley

Location
Urban
Rural

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max 1v:1h

Cost: Medium

1 to 3 m/person hour.

Erosion Control Practices Fact Sheet
Pole Drains (Fascine Drains)

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspection and maintenance required during the first year at a minimum. Check stakes and bundles for tightness and inspect soils for rilling. Inspect weekly in winter for slope instability. Typical maintenance involves redirecting water from rills, filling rills, compacting soil, and securing with erosion control blanket.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Hand crew. Excavator for large central drains.

Construction Complexity Medium

Constraints

Pole drains do not work well in larger drainages and can choke a channel's flow capacity, leading to bank scour. Plants should be harvested and installed during dormancy, late fall through late winter. Pole drains can develop piping in sandy soils; drainage rock may be necessary.

Advantages

Pole drains remove water from wet slopes, break up slope length, dissipate energy, and trap sediments and debris on the slope. The structures allow development of terraces for native plant recruitment and can stabilize slope surfaces. Pole or fascine drains sprout and establish roots for increased slope stability.

Report Sources:

Schiechtl, H.M. Bioengineering for Land Reclamation and Conservation. 1980.

Gray, D.H., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Polster, D. Introduction to Soil Bioengineering, Participant Manual - Forest Renewal. Polster Environmental Services, Duncan, BC. 1998.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Additional Information:

Gray, D.H., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Schiechtl, H.M., and R. Stern. Ground Bioengineering Techniques for Slope Protection and Erosion Control. 1996.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

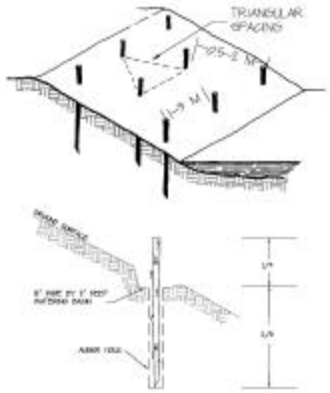
Erosion Control Practices Fact Sheet
Pole Planting

Caltrans
New Technology Report

Description:

Pole planting involves the insertion of live pole cuttings that are stout, long, and will root into the ground and grow. Poles are much longer than live stakes (see Live Staking), ranging from 2 to 3 m in length; they have a diameter of 40 to 75 mm. A system of poles creates a living root mat that stabilizes the soil by binding soil particles together and by extracting excess soil moisture. Willow or cottonwood can be used for this practice.

Keywords: Bioengineering, upslope, waterway.



Pole Planting

Erosion Control Function:

Poles can be used for deep root development on unstable slopes and streambanks. Can be planted through rock rip rap (joint planting) or installed during construction of rock slopes with interstitial fills. Once plants are established, improved cover and soil structure reduce runoff and sediment transport. Pole planting extracts excess soil moisture from wet slopes, allowing soil particles to aggregate and become more stable.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating

Medium

Notes:

Caltrans BMP ID

PSP

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Approved Case by Case

Design Elements:

Poles can be planted close together in highly erodible areas. Pole material is usually fast-growing pioneer species. Successional species should be incorporated into planting or seeding between poles. Poles can be used to take up water in wet soils.

Pole plantings are generally longer and thicker stems than stakes, sprigs, or cuttings. Poles from 2 to 3 m in length can be used to reach lower groundwater tables. Poles are also used for willow post revetments, brush deflectors, vegetated gabions, natural material revetments (rootwads and boulders), and brush checkdams in stream or gully systems.

Ancillary Facilities:

Upslope areas may require seed and mulch. May need browse protection (sleeves) in areas with large deer populations. Wire cages may be required where beavers are present.

Specifications:

Climate Zone

Mountain
Coastal
Valley

Location

Rural

Soil Category

Not rocky

Aspect

West
East
North

Steepness

Max. 1v:2h

Cost: Medium

In good soil, a 2-person crew can plant 10 to 20/hour; a stinger or an excavator can increase planting rate in good soil to 30 to 40/hour (collection time is not included).

Erosion Control Practices Fact Sheet
Pole Planting

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

May need browse protection (sleeves) in areas with large deer populations. Wire cages may be required where beavers are present.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Poles are installed with a 2-person auger, excavator-mounted auger, hand-held water jet, or hydraulic stinger on an excavator. Planting holes need to be backfilled and compacted.

Construction Complexity

Low

Constraints

Poles should be planted during the dormant season. Poles need to be long (2 m or longer), straight, and collected locally. Unlike smaller willow cuttings, pole cuttings can be destructive to donor stand if harvesting is concentrated in one area. Gather poles from salvage sites or thin dense stands rather than clearcut.

Advantages

Poles can reach groundwater, thus reducing irrigation requirements. They provide deep root mass and have a high survival rate. Can be used to secure other surface erosion control materials. Can be used in between as filler or in combination with other biotechnical repairs. Practice is well-suited for sites with fluctuating groundwater levels.

Report Sources:

Prunuske Chatham, Inc. Pole Planting Standard Detail. 2001.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Additional Information:

Schiechtl, H.M., and R. Stern. Water Bioengineering Techniques. 1997.

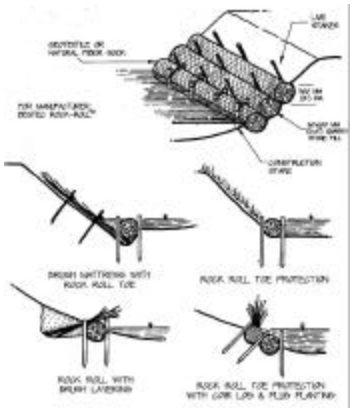
Erosion Control Practices Fact Sheet
Rock Roll Revetment (Vegetated Rock Rolls)

Caltrans
New Technology Report

Description:

A modification of standard gabion rock baskets. A rock roll revetment involves placement and staking of cylinder-shaped baskets filled with rock at the toe of slope for scour and surface protection. Rolls can be vegetated with live poles, live stakes, or brush layering. A series of rolls can be stacked and anchored to the slope face to be used as a revetment. Rock rolls can be made out of relatively long-lasting galvanized wire, as well as natural or synthetic rope nets and coir mats that break down over time after plants and root mass have been established. Willows are typically used where there is ample sunlight and mo isture. Upland plantings are possible with adequate irrigation during the establishment period.

Keywords: Bioengineering, waterway



Rock Roll Revetment (Vegetated Rock Rolls)

Erosion Control Function:

Rock rolls provide immediate protection against scour at the base of slopes. They intercept and filter sediments in runoff. Once plants are established, improved cover and soil structure further reduce runoff and sediment transport.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Design Elements:

Geotechnical and hydrologic concerns must be addressed. Earth anchors, wood stakes, pole planting, or steel stakes can be used to anchor rock rolls. Can be used to protect cut or fill slopes. Rock rolls can be used in the same fashion as coir logs. They can be made of wire or of rope and coir mat that break down over time after plants and root mass have been established.

Effectiveness:

High

Confidence Level in Effectiveness Rating
Medium

Notes:

Not extensively tested.

Ancillary Facilities:

Small staging area required for hand installation, larger area for machine-installed wire baskets.

Specifications:

Climate Zone
Mountain
Coastal
Desert
Valley

Location
Rural
Urban

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max 1v:1h

Cost: Medium

Erosion Control Practices Fact Sheet
Rock Roll Revetment (Vegetated Rock Rolls)

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect rolls for settling of rock and tightness to bank. Anchors may need to be redriven. Plants may need temporary irrigation for establishment. Check plant vigor during dry season.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Rock rolls can be built in segments off site and moved into the final location. Small equipment. Hand crews can construct in areas with poor access.

Construction Complexity

Medium

Constraints

Wires are susceptible to failure from abrasion and rust over time. They can also have a shorter life span in areas with ocean air or fog influence.

Advantages

Vegetated rock rolls provide immediate protection from erosion. They are an alternative to rock rip rap revetments using smaller sized material. Plant roots help tie the structure into the slope, creating a coherent, solid mass. Vegetation eventually hides structural components, allowing for a more natural appearance. Can be constructed by hand on site in areas with poor access. Can be installed as a temporary or permanent measure. Can be used in a terraced system. Are compatible with pole planting or brush layering practices. Can be used as toe protection for willow wall revetments or brush mattresses.

Report Sources:

Prunuske Chatham, Inc. Rock Roll Revetment Standard Detail. 2001.

Additional Information:

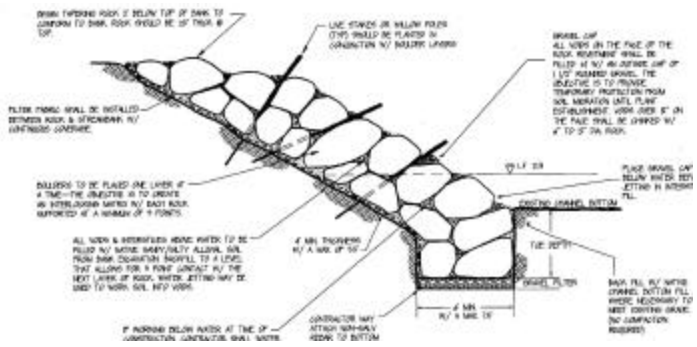
Schiechtl, H.M., and R. Stern. Water Bioengineering Techniques. 1997.

Erosion Control Practices Fact Sheet
Rock with Interstitial Fill

Caltrans
New Technology Report

Description:

This method fills the interstices or voids of rock rip rap, rock or boulder revetments, rock gravity walls, and rock channels with soil to promote plant establishment, wildlife habitat values, and aesthetics. A vegetative component to rock revetments can increase the strength of the repairs. With placement of interstitial fill, individual planting beds can be constructed throughout the rock repair for rooted seedlings o live staking. In rock channels, alluvial interstitial fill keeps the water running on top of the channel as in a natural stream
Keywords: Bioengineering, upslope, waterway



Rock with Interstitial Fill

Erosion Control Function:

By keeping water flowing on top of the rock work or by allowing plant growth between rocks, this method reduces undercutting of rock work. Also allows for relief of subsurface water pressure by maintaining porosity of the structure.

Effectiveness:

High

Confidence Level in Effectiveness Rating

High

Notes:

Caltrans BMP ID

HS

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

The best way to install interstitial fill is by building rock repairs in lifts. Soil or alluvium is placed on the rock lift and water-jetted into the voids. Fill volume should be limited to allow for rock-on-rock contact at all times. Rooted or live stakes can be installed at each lift. A gravel or light rock cap on the repair face is recommended in stream and river environments to prevent topsoil piping. Topsoil is placed in the back of the repair for rooting.

Geotechnical and hydrologic conditions must be considered, including groundwater. On slopes with frequently saturated soils, subsurface drains may be required. Survey native species for revegetation plant palette. Drip irrigation may be required for plant establishment. Consider hand chinking rock voids on faces over 300 mm2. When using this practice, it is assumed that the rock has been properly sized by the engineer.

Ancillary Facilities:

This practice can be used in conjunction with live staking, container stock planting, rock rip rap, topsoiling, and fabric reinforced earth fills. Sediment barriers and/or turbid water facilities are needed during construction. On slopes with frequently saturated soils, subsurface drains may be required. Gravel filters are recommended for rock faces.

Specifications:

Climate Zone

Mountain
Coastal
Valley
Desert

Location

Rural
Urban

Soil Category

Rocky
Not rocky

Aspect

N/A

Steepness

1:1 max.
Max 1v:1h

Cost: Medium

Erosion Control Practices Fact Sheet
Rock with Interstitial Fill

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect for soil piping. Hand-placed rock with gravel filter can repair piping in many cases.

Staffing/Equipment

Hand crew. Loader and excavator for large repairs.

Project Development:

Construction

Pump, water supply, and loader to spread fill for water-jetting. Temporary sediment barrier or turb id water facility are needed during construction.

Construction Complexity

High

Constraints

Filling rock voids with interstitial fill and plants after the rock has been installed is much more difficult than completing the work in lifts during construction. Topsoil can pipe in aquatic applications. Gravel filters are recommended for rock faces. It is difficult to fill voids in small rock rip rap with soil; works best with 1/2 ton or larger boulders.

Advantages

Vegetation can help anchor the rip rap to the bank while creating wildlife habitat, riparian zone cover, and aesthetic qualities.

Report Sources:

Prunuske Chatham, Inc. Rock with Interstitial Fill Standard Detail. 2001.

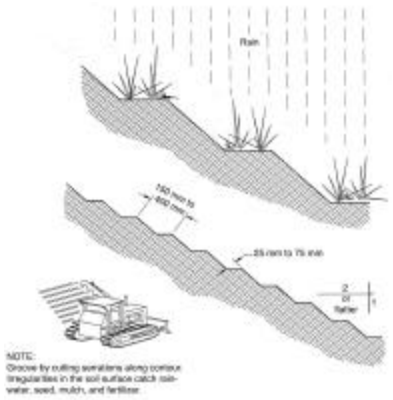
Additional Information:

Erosion Control Practices Fact Sheet
Serrated Slope

Caltrans
New Technology Report

Description:

Surface roughening. Shallow grooves or serrations are cut along contours. Irregularities in the soil surface catch rainwater, seed, mulch, and fertilizer. Used on slopes 1v:2h or flatter. Serrations are typically 150 mm to 400 mm ridge-to-ridge with depths from 25 mm to 75 mm.



Serrated Slope

Erosion Control Function:

Facilitates long-term stabilization with vegetation.

Caltrans BMP ID
STS

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Design Elements:

Serrations must be on contour on slopes flatter than 1v:2h. Break up slope lengths with benches or by other means. Seed and mulch bare soils. Divert run-on away from freshly graded areas using brow ditches or equivalent. Requires drainage control at top of slope.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating
Low

Notes:

Originally described in Caltrans' Construction Contractor's Guide and Specifications CD35(2).

Ancillary Facilities:

Seed and mulch bare soils. Divert run-on away from freshly graded areas using brow ditches or equivalent.

Specifications:

Climate Zone
Valley
Coastal
Mountain
Desert

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance:

Requirements

Inspect weekly or biweekly during the rainy season. Repair rills by raking soil on contour and mulching. Divert concentrated run-on.

Staffing/Equipment

Hand labor and hand tools.

Project Development:

Construction

Often constructed with a slope bar on the side of a tractor. Long cut slopes need to be serrated starting from top of slope as benches are created and removed.

Construction Complexity Low

Constraints

Not suitable for sandy soils. Requires drainage control at top of slope.

Advantages

Relatively simple method to facilitate plant establishment.

Report Sources:

Caltrans. Project Planning and Design Guide. Caltrans Storm Water Quality Handbooks. May, 2000.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Additional Information:

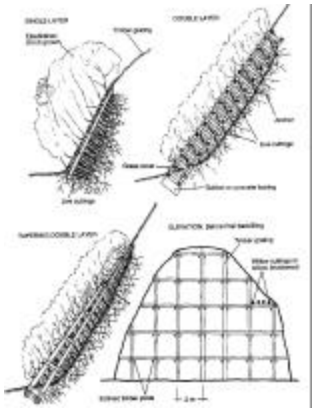
Erosion Control Practices Fact Sheet
Slope Grating

Caltrans
New Technology Report

Description:

Slope grating is used to establish vegetation on steep slopes (1v:1.5h or steeper) that normally would not be able to be revegetated without other structural means. Slope grating consists of long vertical timbers or other materials with horizontal cross timbers fastened to create a grid system. Spaces in the timber grid are filled with selected soils and brush layerings or live pole plantings. Grates need to be built on stable footings at the base of slope.

Keywords: Bioengineering, upslope.



Slope Grating

Erosion Control Function:

Once plants are established, improved cover and soil structure reduce runoff and sediment transport.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut

Status
Not Approved

Design Elements:

Geotechnical and hydrologic concerns must be addressed. Subsurface drains may be required at base of slope. A rock toe/ foundation is usually required at base of slope. Earth anchors may be used for additional support.

Effectiveness:

Unknown

Confidence Level in Effectiveness Rating
Low

Notes:

Should be field-tested and evaluated.

A project was designed by Robbin Sotir and constructed by Doug Hanford in an area with poor access in the hills of the East Bay.

Ancillary Facilities:

Compatible with brush layering and pole planting practices, container planting, temporary drip irrigation, rock placement, and subsurface drains. South-facing slopes may need irrigation for establishment. Subsurface drains may be required at base of slope. A rock toe/ foundation is usually required at base of slope. Earth anchors may be used for additional support.

Specifications:

Climate Zone
Valley
Coastal
Mountain

Location
Urban
Rural

Soil Category
Rocky
Not rocky

Aspect
North
East
South
West

Steepness
Max 1v:1h
< 1v:1h

Cost: Medium

Issues and Concerns

Maintenance:

Requirements

Temporary irrigation may be required, depending on location and site conditions.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Loader, excavator or backhoe, and trucking for gravel installation. Hand crew for plant installation and timber grate construction.

Construction Complexity High

Constraints

Labor-intensive. Maximu m recommended height is 15 to 20 m.

Advantages

Permits plant establishment on steep slopes. Can be used to establish vegetation on rocky slopes. Does not require large amounts of imported fill. Only minor excavation is required.

Report Sources:

Schiechtl, H.M., and R. Stern. Ground Bioengineering Techniques for Slope Protection and Erosion Control. 1996.

Gray, D., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Additional Information:

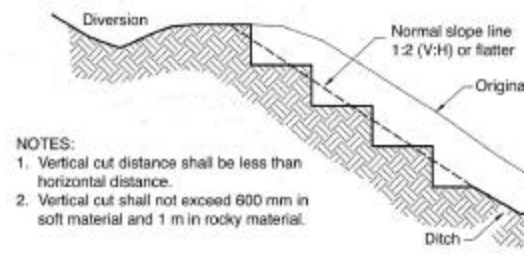
Schiechtl, H.M. Bioengineering for Land Reclamation and Conservation. 1980.

Erosion Control Practices Fact Sheet
Stepped Slope with Topsoiling

Caltrans
New Technology Report

Description:

Slope shaping technique used to break up slope length, reducing both the volume and velocity of water runoff. Place 100 to 150 mm topsoil on surface of steps. Creates growing zones on the steps for long-term plant establishment. Used on slopes 1v:2h or flatter.



Stepped Slope with Topsoiling

Erosion Control Function:

On high cuts, stepped slopes create growing niche for plant establishment. Traps sediment and increases infiltration. Reduces runoff, which becomes available for plant growth. Use instead of slope benches on high cuts.

Caltrans BMP ID
STS

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut

Status
Approved Case by Case

Design Elements:

Steps must be on contour with normal slope line 1v:2h or flatter. Vertical cut distance shall be less than horizontal distance. Vertical cut shall not exceed 600 mm in soft material and 1 m in rocky material. Place 100 to 150 mm of topsoil on steps (see Topsoiling). Do not exceed 85% compaction. Add topsoil to steps where it is lacking.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Originally described in Caltrans' Construction Contractor's Guide and Specifications CD35(2).

Ancillary Facilities:

Seed and mulch bare soils. Divert run-on away from freshly graded areas and into stable structures or channels.

Specifications:

Climate Zone
Valley
Desert
Mountain
Coastal

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Medium

Erosion Control Practices Fact Sheet
Stepped Slope with Topsoiling

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect weekly or biweekly during the rainy season. Repair rills by raking soil on contour and mulching. Divert concentrated run-on.

Staffing/Equipment

Hand labor and hand tools.

Project Development:

Construction

Scarify steps before placing topsoil. Topsoil compaction should not exceed 85%.

Construction Complexity Medium

Constraints

Not practical for sandy or shallow soils.

Advantages

Reduces slope steepness where wide benches would otherwise be used. Creates niche for plant establishment. Reduces critical area slope steepness.

Report Sources:

Caltrans. Project Planning and Design Guide. Caltrans Storm Water Quality Handbooks. May, 2000.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Haynes, John. Caltrans District 7. Personal communication, 2001. John_Haynes@dot.ca.gov.

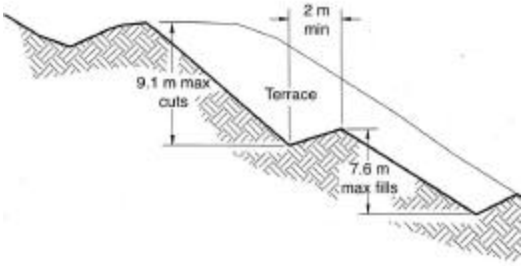
Additional Information:

Erosion Control Practices Fact Sheet
Terraced Slope with Topsoiling

Caltrans
New Technology Report

Description:

Slope shaping. Terraces consist of cuts (not to exceed 9.1 m) and fills (not to exceed 7.6 m) to create slope breaks and plant zones on steeper slopes. Terrace platforms are slightly insloped. 100 to 150 mm of topsoil are placed on surface of terraces.



Terraced Slope with Topsoiling

Erosion Control Function:

Breaks up slope length, thereby reducing water velocity. Traps sediment and increases infiltration. Creates zones for permanent plant establishment.

Caltrans BMP ID
STS

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut

Status
Approved Case by Case

Design Elements:

Should be designed under the direction of and approved by a registered professional civil engineer based on site calculations. Topsoil compaction shall not exceed 85%. Add topsoil to terraces where it is lacking.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Low

Notes:

Originally described in Caltrans' Construction Contractor's Guide and Specifications CD35(2).

Ancillary Facilities:

Must be designed with adequate drainage and stabilized outlets. Seed and mulch bare soils. Divert run-on away from freshly graded areas and into stable structures or channels.

Specifications:

Climate Zone
Mountain
Coastal
Valley
Desert

Location
Urban
Rural

Soil Category
Not rocky
Rocky

Aspect
N/A

Steepness
Max. 1v:2h

Cost: Medium

Erosion Control Practices Fact Sheet
Terraced Slope with Topsoiling

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect weekly or biweekly during the rainy season. Repair rills by raking soil on contour and mulching. Divert concentrated run-on. Armor eroding terrace runoff.

Staffing/Equipment

Hand labor and hand tools.

Project Development:

Construction

Should be designed under the direction of and approved by a registered professional civil engineer based on site calculations. Scarify steps before placing topsoil. Topsoil compaction should not exceed 85%.

Construction Complexity Medium

Constraints

This configuration can cause mass wasting due to excess moisture emerging on the lower slope. Not practical for sandy soils. Requires professional engineering.

Advantages

Reduces slope length. Creates niche for plant establishment.

Report Sources:

Caltrans. Project Planning and Design Guide. Caltrans Storm Water Quality Handbooks. May, 2000.

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

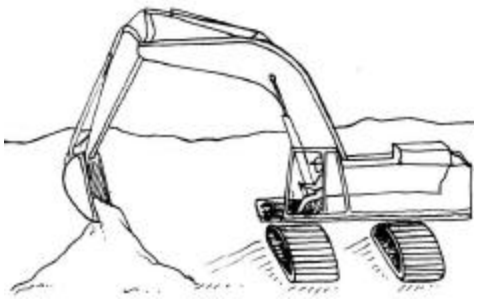
Additional Information:

Erosion Control Practices Fact Sheet
Topsoiling

Caltrans
New Technology Report

Description:

Healthy topsoil will ensure adequate vegetation cover for erosion control. Topsoiling is a procedure to remove existing topsoil on cut or fill slopes to a depth of approximately 100 to 150 mm, depending on the soil profile, stockpiling it, and then reapplying it on top to final grade. Where topsoil is not available on site, imported topsoil may be required. Sampling to confirm soil quality and suitability for site conditions and additional criteria beyond existing standard specifications is required. Maximum compaction is 85%. Soil amendment.



Topsoiling

Erosion Control Function:

Topsoiling promotes rapid plant growth, which ultimately controls erosion.

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Standard Spec

Design Elements:

Need to know percent slope to determine if other techniques or products are required to initially keep the soil on the slope. Generally limited to 1v:2h slopes or flatter except on benches, steps, and geogrids. Scarify the face of the excavation to a depth of 8 cm on contour to reduce the interface problem. Need to know typical depth of A horizon - do not use topsoil from source deeper than 15 cm. Do not stockpile deeper than 1 m or for more than one year. Test imported topsoil for pH; the pH range should ordinarily be between 6.0 and 7.5. Lime or gypsum may correct pH. Where imported topsoil comes from agricultural areas, crop history is required to determine if residual herbicides could be present. A lab analysis for presence of herbicides may be required before accepting off-site soils. Survey native species for revegetation plant palette. Where slope terraces and steps are constructed, these shall be dressed with 10 to 15 cm of topsoil. Compaction shall not exceed 85%.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
High

Notes:

Caltrans Standard Specification 20-2.01 describes basic topsoil. Additional design elements are needed as described herein to ensure suitable material and its correct application. Every project where fill is placed or banks are cut into slopes less than 1v:2h shall require, where practicable, the removal, stockpiling, and re-application of topsoil. See Topsoiling with Cellular Confinement for steeper slopes.

Ancillary Facilities:

Topsoil typically contains seed and microorganisms that will promote plant growth. However, additional seed and mulch are usually required, especially on slopes. Other practices may also be appropriate, such as wattles, erosion control blankets, and biotechnical techniques. Stockpile area for topsoil may be required.

Specifications:

Climate Zone
Mountain
Coastal
Valley
Desert

Location
Rural
Urban

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max. 1v:2h

Cost: Medium

More expensive if topsoil has to be imported.

Erosion Control Practices Fact Sheet
Topsoiling

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Conduct site inspection during winter storms and correct any drainage problems. During the first winter, inspect weekly for slope instability. Typically, redirect water from rills, fill rills with soil, compact, and secure with erosion control blanket.

Staffing/Equipment

Hand tools to repair mulch cover or redirect water as needed.

Project Development:

Construction

Grading plans should incorporate final grades with applied topsoil. Construction crews should be aware that on-site topsoil is to be stockpiled whenever there is extensive cut and fill. Topsoil compaction should not exceed 85%.

Construction Complexity

Medium

Constraints

Not suitable for steeper than 1v:2h slopes without reinforcement (see Topsoiling with Cellular Confinement). Check the topsoil quality, including pH and what was growing on it in the past. Importing topsoil is expensive. Do not use heavy clay or highly organic (peat, muck) topsoils. There may be undesirable weed seed in topsoil.

Advantages

Where topsoil is available on site, topsoiling is a relatively inexpensive way to improve first year vegetation establishment. Existing seed in on-site topsoil will help establish those species that were present prior to construction. Topsoil generally has better texture and nutrient content than subsoil, thus improving the soil's ability to support vegetation and stabilize surface soils. Primary benefits include humus and associated nutrients and soil micro-organisms adapted to the site's edaphic, hydrologic, climatic, and biological conditions.

Report Sources:

A&L Agricultural Lab. Agronomy Handbook. Soil and Plant Analysis.

Haynes, John. Caltrans District 7. Personal communication, 2001. John_Haynes@dot.ca.gov.

Caltrans. Standard Specifications. 1999. State of California Department of Transportation. Sacramento, CA.

Prunuske Chatham, Inc. 2001.

Additional Information:

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Erosion Control Practices Fact Sheet
Topsoiling with Cellular Confinement

Caltrans
New Technology Report

Description:

For use on cut slopes from 1v:2h up to 1:1 where perennial vegetation is desired. This practice combines topsoiling with a geotextile cellular confinement system.
Keywords: Bioengineering, upslope, soil, amendment.

Topsoiling with Cellular Confinement

Erosion Control Function:

Improves cover and soil structure. Reduces runoff and sediment transport by confining soils within geotextile cells. Reduces formation of channels.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut

Status
Approved Case by Case

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Design Elements:

Need to determine percent slope, upslope watershed contribution, and competence of subsoil or substrate. Survey local plant communities for native revegetation plant palette. Patented cellular confinement devices are commercially available.

A polypropylene honeycomb product such as GeowebTM is used. Interconnected cells are typically about 100 mm deep by 300 mm long by 300 mm wide. The geotextile must have perforated walls and be secured by an anchor and tendon system. 15 mm diameter rebar is typical for anchors. Topsoil is placed into cells and lightly compacted. Compaction is not to exceed 85%. Seed is then broadcast on top, and a hydromulch or erosion control blanket is applied on top of the seed. See also Topsoiling practice.

Ancillary Facilities:

Drainage from upslope must be diverted or dissipated. The top of the cellular confinement geotextile must be anchored over the crest of a slope or in a trench below grade. Additional “dead man” anchors or other earth anchors may be required. Installation of anchors may require a pneumatic hammer. Apply mulch or erosion control blanket over cellular confinement system.

Specifications:

Climate Zone
Mountain
Coastal
Valley
Desert

Location
Urban
Rural

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max 1v:1h
< 1v:1h

Cost: High

Can be as high as $10-$15/m2 = $100,000 to $150,000 per hectare.

Issues and Concerns

Maintenance:

Requirements

Inspect weekly in winter for slope instability. Typically, redirect water from rills, fill rills with soil, compact soil in cells, and secure with erosion control blanket or top with mulch.

Staffing/Equipment

Hand tools to refill cells or repair mulch cover or erosion control blanket as needed.

Project Development:

Construction

Patented devices are required; several manufacturers of cellular confinement devices are available. Installation of anchors may require a pneumatic hammer. Spreading and light compaction may be accomplished by hand tools or excavator. Topsoil compaction should not exceed 85%.

Construction Complexity Medium

Constraints

Subsoil must be competent. Not appropriate for solid rock surfaces.

Advantages

Established vegetation will reduce surface erosion and provide aesthetic benefits.

Report Sources:

Presto Products Company, http://www.prestogeo.com.

John McCullah, Salix Applied Earthcare.
http://www.biodraw.com.

Additional Information:

Soil Stabilization Products Company, Inc.
http://www.sspco.org.

Geotechnical Fabric Report, May, 1996.

Geofabrics Journal, Volume 2, Number 1, February, 1996.

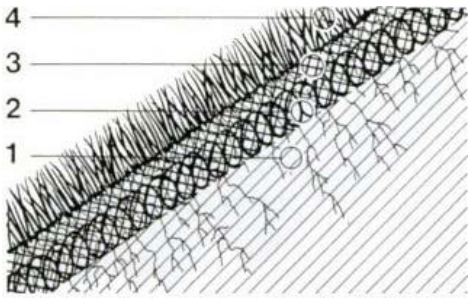
Erosion Control Practices Fact Sheet
Turf Reinforcement Mat with Perennial Vegetation

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM)-lined ditches on steep slopes provide a structural substrate for topsoil and perennial grasses. TRMs are a 3-dimensional matrix of polyethylene or other plastics that are UV-stabilized. Durable synthetic 3-dimensional matrices are approximately 17 mm thick with about 90% void space. TRMs are not the same as erosion control blankets, which are placed on top of soil and seed. A number of products for different flow rates are available. This technology is currently lumped in with several others in Caltrans BMP # SS-7, Geotextiles. It is also appropriate for #SS-9, Lined Ditches. It is recommended that TRM stand alone as a method for ditch or swale stabilization and upslope topsoiling.

Keywords: Bioengineering, upslope, waterway.



TRM installed on slope. 1) subsoil, 2) TRM, 3) topsoil, 4) perennial grass.

Turf Reinforcement Mat (TRM)

Erosion Control Function:

Improved cover and soil structure reduce runoff and sediment transport. Used in place of rock or concrete in diversion ditches and drainage swales to prevent gullying while allowing for infiltration. As a porous material, allows relief of groundwater pressure, which can be a problem with technologies such as concrete. Provides increased shear strength to allow plant material usage in drainage channels.

Effectiveness:

High

Confidence Level in Effectiveness Rating

High

Notes:

Tested by Caltrans. Tested at flow rates in excess of 6 m/sec. Case study in Hawaii with successful application on 1:1 slope with 300 cm/year rainfall. This technology is currently lumped in with several others in Caltrans BMP # SS-7, Geotextiles. It is also appropriate for #SS-9, Lined Ditches. It is recommended that TRM stand alone as a method for ditch or swale stabilization and upslope topsoiling.

85% to 95% effectiveness.*

Specifications:

Climate Zone
Valley
Desert
Mountain
Coastal

Location
Rural
Urban

Soil Category
Not rocky

Aspect
N/A

Steepness
Max 1v:1h

Caltrans BMP ID
PSP, SS-7, SS-9

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Design Elements:

Suitable topsoil on TRM and a correct perennial seed mix to match the microclimate are required. When used as a channel liner, flow rates must be compatible with manufacturer's recommendations. The ground is smoothed for continuous contact, and the TRM is anchored into place according to the manufacturer's specifications. Anchors are typically 230 to 310 mm long metal pins with washers. An upstream or uphill anchor trench is required. After a TRM is anchored to the ditch or slope, the voids are partially filled with a thin layer of topsoil placed in the mat (see Topsoiling), seeded, and gently smoothed with brooms. Correct installation is critical to the performance of TRMs. Follow manufacturer's recommendations as to design, specificaiton, and installation of the material in conjunction with a revegetation specialist's seed prescription.

Ancillary Facilities:

Upslope areas of bare soil not covered with TRM will require seed and/or mulch or other stabilization. Concentrated outfalls should be armored. Hydroseed and mulch on top of TRM will improve early short-term erosion control.

Cost: High

Installed cost (not including seed) is $34,000 to $55,000 per acre.

Erosion Control Practices Fact Sheet — Caltrans

Turf Reinforcement Mat with Perennial Vegetation — New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect during winter storms for slope instability. Typically, redirect water from any undercutting rills. Fill rills with soil, compact, re-secure TRM as needed. May require cutting TRM and installing a new section.

Staffing/Equipment

Hand tools, supplementary anchors, and TRM material.

Project Development:

Construction

Patented TRM devices are required and are available from several manufacturers. Slopes are smoothed by hand or tractor. Anchors are typically 230 to 310 mm long metal pins with washers driven with hammers. Soil is backfilled by hand or with an excavator or loader. Follow manufacturer's recommendations for installation.

Construction Complexity Medium

Constraints

Relatively expensive; must be installed over a uniformly graded surface and anchored securely. If topsoiling and plant selection is inadequate, the plastic material becomes exposed, which is unsightly and may ensnare wildlife. Correct seed mixture must be used in conjunction with TRMs.

Advantages

Keeps soil and vegetation in place with a natural-looking appearance. Immediate erosion control when installed; long-lasting erosion control with the appropriate perennial vegetation. Has been used as a replacement for concrete or rock-lined channel. On steep cut slopes, provides a structure to allow for topsoiling.

Report Sources:

Synthetic Industries, http://www.sigeosolutions.com.

Salix Applied Earthcare, http://www.biodraw.com.

American Enka Co., Enka, North Carolina.

International Erosion Control Association. How to Select, Install and Inspect Construction Site Erosion and Sediment Control BMPs for NPDES Storm Water Permit Compliance. September, 2001.

Caltrans. Project Planning and Design Guide. Caltrans Storm Water Quality Handbooks. May, 2000.

Additional Information:

North American Green, http://www.nagreen.com.

* Erosion Control Pilot Study, Caltrans, June 2000, CTSW-RT-00-012

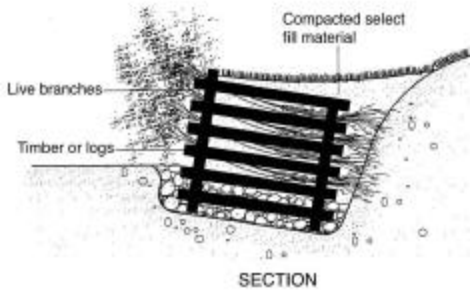
Erosion Control Practices Fact Sheet
Vegetated Crib Walls

Caltrans
New Technology Report

Description:

Traditional crib walls are interlocking units with structural components of concrete or treated timber backfilled with well-drained material. Vegetated crib walls can be constructed out of untreated timber that decomposes over time or out of traditional components. The structure is backfilled with soils suitable for plant growth and adequate drainage. The crib face openings can be planted with brush layers, pole plantings, or rooted materials.

Keywords: Bioengineering, upslope, waterway.



Vegetated Crib Walls

Erosion Control Function:

Can be used at the toe of slope to reduce the steepness of uphill slopes, thus allowing for upslope revegetation and other erosion control methods. Vegetation helps stop crib wall fill from washing through the face.

Effectiveness:

High

Confidence Level in Effectiveness Rating

Medium

Notes:

Caltrans BMP ID

PSP

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Crib walls and all gravity wall structures require computations to determine their stability against overturning, sliding along the base, bearing capacity failure, and rotational slips. Geotechnical and hydrologic considerations must be assessed. In some locations, timber cribs can be designed to decompose over time, allowing the established roots to become the main structural component. Some crib wall manufacturers have developed permanent systems with openings specifically for vegetation establishment. An erosion control blanket or coir mat can be installed in the crib face when poles are used to prevent stream scour and piping along base.

Ancillary Facilities:

Crib walls require staging areas for equipment, soil, rock, and crib material. South- or southwest-facing slopes may require irrigation for plant establishment. Cranes are needed for tall structures.

Specifications:

Climate Zone

Valley
Desert
Mountain
Coastal

Location

Rural
Urban

Soil Category

Not rocky

Aspect

North
East
South
West

Steepness

< 1v:1h
> 1v:1h

Cost: High

Can be very expensive.

Erosion Control Practices Fact Sheet
Vegetated Crib Walls

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Depending on vegetation type, crib walls may need to be trimmed periodically after establishment. Check walls for any movement or instability. Inspect plant vigor during dry season.

Staffing/Equipment

Hand crew or road cutting machinery.

Project Development:

Construction

Excavators, loaders, trucking, and hand labor are required. Cranes are needed for tall structures. Several commercial crib wall systems are available.

Construction Complexity High

Constraints

Expensive to construct. Live log cribs are less expensive to construct, but they are not suitable for locations where the crib wall would need to support substantial weight.

Advantages

Vegetated crib walls provide immediate protection from erosion. They can be used where access is limited and a vertical or near vertical wall is desirable. Can provide slope protection against scour. Vegetation will eventually obscure structural components, allowing for a more natural appearance combined with a near vertical structure. May reduce graffiti in urban areas.

Report Sources:

Gray, D., and A. Leiser. Biotechnical Slope Protection and Erosion Control. 1982.

Gray, D., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Additional Information:

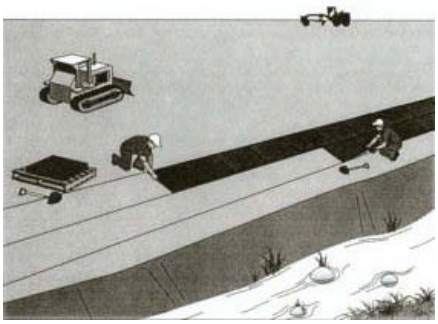
USDA Natural Resource Conservation Service. “Soil Bioengineering for Upland Slope Protection and Erosion Reduction.” Engineering Field Handbook. Chapter 18. 1992.

Erosion Control Practices Fact Sheet
Vegetated Filter (Buffer) Strip

Caltrans
New Technology Report

Description:

Vegetated Filter Strips (VFS) usually consist of a dense, permanent herbaceous (grass) cover created by sodding or plugging.
Keywords: Bioengineering, upslope, waterway.



Vegetated Filter (Buffer) Strip

Erosion Control Function:

Effectively filters sediment as soon as it is installed when overland flow is evenly distributed along the strip, rather than concentrated in rills or ditches.

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Design Elements:

Fine grading is required to smooth the site before planting. Effective when overland flow is evenly distributed along strip, rather than concentrated in rills or ditches. Width of the VFS increases with increase in slope steepness. Sod should be lightly rolled after installation. On slopes, sod should be applied with the long dimension perpendicular to the slope and pegged or stapled sufficiently to prevent movement.

Effectiveness:

Medium

Confidence Level in Effectiveness Rating
Medium

Notes:

Best on slopes less than 1v:3h.
Guideline VFS widths:
0% slope, Width = 8 to 17 m.
10% slope, Width = 15 to 30 m.
20% slope, Width = 22 to 43 m.
30% slope, Width = 30 to 63 m.
40% slope, Width = 35 to 70 m.
Originally described in Caltrans' Construction Contractor's Guide and Specifications CD30(2).

Ancillary Facilities:

Runoff from upslope must be evenly spread out before entering VFS. May be used in conjuction with erosion control blankets or turf-reinforced mats. Typically requires irrigation to become established.

Specifications:

Climate Zone
Mountain
Coastal
Valley

Location
Urban
Rural

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max. 1v:3h

Cost: High

High cost for installed sod and plugs. Preserving existing vegetation is least expensive.

Issues and Concerns

Maintenance:

Requirements

Inspect VFS weekly and after significant storm events until vegetation is established; inspect routinely thereafter. Repair eroded or damaged areas as needed to maintain original function.

Staffing/Equipment

One person with a shovel or McLeod. Additional sod or erosion control blanket may be needed for repairs.

Project Development:

Construction

Need to pre-order sod or plugs. Typically, a box scraper and roller are used for installation of sod. Plugs are installed individually with the use of a shovel, hoe, auger, or furrow plow.

Construction Complexity Low

Constraints

Should not be placed on slopes greater than 1v:3h. Effectiveness may be negated if water is allowed to channel through VFS. Where sod or plugs are required, plant material must be ordered in advance. Water requirements for sod make this practice infeasible for water-scarce areas.

Advantages

Aesthetically compatible with most operations. The same benefits can be gained by preserving a strip of existing plant cover; where existing vegetation can be protected and serve as the VFS, this is a very inexpensive option. Especially suitable for placement between construction sites and watercourses.

Report Sources:

Caltrans. Project Planning and Design Guide. Caltrans Storm Water Quality Handbooks. May, 2000.

SedSpec,
http://www.cecer.army.mil

International Erosion Control Association. How to Select, Install and Inspect Construction Site Erosion and Sediment Control BMPs for NPDES Storm Water Permit Compliance. September, 2001.

Additional Information:

Gharabaghi, B, R.P. Rudra, H.R. Whiteley, and W.T. Dickinson. “Improving Removal Efficiency of Vegetative Filter Strips.” In: Proceedings of Conference 32. International Erosion Control Association. February, 2001.

Allison, Bruce E, and Abhijaya Dhakal. “Simulating the Effectiveness of Vegetative Filter Strips in Reducing Sediment Yield.” In: Proceedings of Conference 31. International Erosion Control Association. February, 2000.

Etra, Julie, Kym Kelley, Claudia Zachreson, and Dan Greytak. “Propagated Erosion Control Mat for Riparian and Wetland Restoration-From Design Through Installation.” In: Proceedings of Conference 31. International Erosion Control Association. February, 2000.

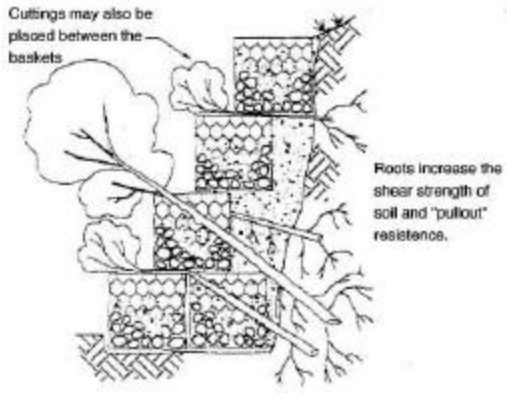
Erosion Control Practices Fact Sheet
Vegetated Gabions

Caltrans
New Technology Report

Description:

Gabions are commonly used for gravity wall and toe of slope stabilization. They consist of rectangular baskets constructed of heavy galvanized steel wire filled with quarry stone. Gabions can be used in a single row or stacked in a stair step fashion. Vegetated gabions have plant material laid between the baskets in horizontal layers using pole plantings (typically willows), rooted plant materials, or brush layering. The plant material will set roots into the backfill behind the gabions and through the gabions creating a coherent, solid mass. Interstitial fill with sandy gravels between rocks in baskets provides rooting medium for plantings. Can be used for cut or fill slope stabilization.

Keywords: Bioengineering, upslope, waterway.



Vegetated Gabions

Erosion Control Function:

Vegetated gabions can be used in toe of slope applications to reduce steepness. They allow for use of upslope revegetation and other erosion control methods. Vegetated gabions stabilize slopes against mass wasting. See also, Rock Roll Revetment.

Effectiveness:

High

Confidence Level in Effectiveness Rating

Medium

Notes:

Caltrans BMP ID

None

SWMP Category

IB: Permanent

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

All gabion and gravity wall structures require computations to determine their stability against overturning, sliding along the base, bearing capacity failure, and rotational slips. Geotechnical and hydrologic concerns must be addressed. Can be used for cut or fill slope stabilization. Geotextiles can be used on gabion faces if piping is a concern. Gabions can be installed subsurface for internal slope stability with soil and vegetation covering.

Ancillary Facilities:

An area to construct baskets and stockpile rock and interstitial fill is required. Geotextiles can be used behind gabions if piping is a concern.

Specifications:

Climate Zone

Mountain
Desert
Valley

Location

Rural
Urban

Soil Category

Not rocky

Aspect

North
East
South
West

Steepness

Max 1v:1h
< 1v:1h

Cost: High

Issues and Concerns

Maintenance:

Requirements

Temporary irrigation may be required. Baskets are susceptible to abrasion and rust in stream and ocean environments. Check gabions for any movement or instability. Check plant vigor during dry season.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Excavators, loaders, trucking, and hand labor are required. Baskets are filled in place with loaders, conveyors, buckets, or hand work. Hand labor required to evenly distribute rock and fill and to wire tops and basket-to-basket connections.

Construction Complexity High

Constraints

Expensive to construct. Wire baskets are susceptible to failure from abrasion and rust over time. Steel alloys and wire coatings reduce this effect. Gabions tend to have reduced lifespan in areas with ocean air or fog influence.

Advantages

Vegetated gabions provide immediate protection from erosion. Developing plant roots help tie the structure into the slope, creating a coherent, solid mass. Vegetation hides structural components over time allowing for a more natural appearance combined with a near vertical structure. Ideal for areas with limited space along right-of-way.

Report Sources:

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Gray, D., and R.B. Sotir. Biotechnical and Soil Bioengineering Slope Stabilization. 1996.

Additional Information:

USDA Natural Resource Conservation Service. “Soil Bioengineering for Upland Slope Protection and Erosion Reduction.” Engineering Field Handbook. Chapter 18. 1992.

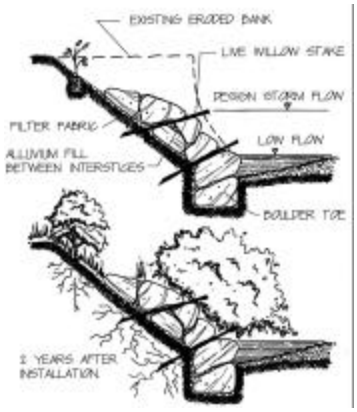
Riley, A. Restoring Streams in Cities. 1998.

Erosion Control Practices Fact Sheet
Vegetated Rock Revetment (Joint Planting)

Caltrans
New Technology Report

Description:

Live stakes, poles, or rooted plants are integrated into rock or boulder revetments. The vegetation can increase the repair's strength, create habitat values, and improve aesthetic qualities. Most successful when plant material is installed during rock placement. Depending on the thickness of the rock revetment, retrofitting may be possible by working plant materials into spaces between the rock and packing interstitial spaces with suitable soils.
Keywords: Bioengineering, upslope, waterway.



Vegetated Rock Revetment (Joint Planting)

Erosion Control Function:

Once plants are established, improved cover and soil structure reduce erosion and trap sediments.

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Design Elements:

Geotechnical and hydrologic conditions must be addressed, including groundwater. In some environments, subsurface drains may be required. Rock should be placed on a geotextile fabric or gravel filter to prevent piping. Hand chink rock voids over 300 mm2. Live willow stakes or pole plantings are usually used. Drip irrigation may be required for plant establishment. Maximum recommended rock slopes are 1:1. However 1v:0.5h has been used by staking in large boulder rip rap. Addition of vegetation does not impose facility requirements beyond those required for rock placement.

Effectiveness:

High

Confidence Level in Effectiveness Rating
Medium

Notes:

Ancillary Facilities:

In some environments, subsurface drains may be required. Rock should be placed on a geotextile fabric or gravel filter to prevent piping. Drip irrigation may be required for plant establishment, particularly for container plantings. Temporary sediment barrier or turbid water facility is required.

Specifications:

Climate Zone
Mountain
Coastal
Valley
Desert

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Aspect
North
East
South
West

Steepness
1:1 max.
Max 1v:1h

Cost: Medium

Rock costs will be based on placement method. A person can collect 25 to 40 live stakes/hour and install 25 to 30 stakes/hour. Increase time for poles, decrease for soft soil.

Erosion Control Practices Fact Sheet
Vegetated Rock Revetment (Joint Planting)

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Inspect for soil piping and rock movement. Hand-placed rock with gravel filter can repair piping in many cases. Irrigation during the establishment period may be required, particularly for container plantings.

Staffing/Equipment

Hand crew unless major failure.

Project Development:

Construction

Excavator or backhoe, loader, trucking, and hand crew for plant collection. Temporary sediment barrier or turbid water facility.

Construction Complexity Medium

Constraints

Joint planting revetments after rock installation are much more difiicult than completeing the work in lifts during construction. Topsoil can pipe in high volume runoff conditions, and gravel filters are recommended for the rock face. Irrigation may not be feasible in isolated areas.

Advantages

Vegetation can help anchor the rip rap to the bank while creating habitat values and improved aesthetic quality. Plant roots can tie the rock into the existing slope, creating a coherent, solid mass. Creates an immediate protective cover on the streambank or slope surface even before plant development. Can be used to fill slides and protect toe of slope. An improvement upon traditional rip rap revetments by establishing interstitial vegetation that further stabilizes the revetment and softens the appearance of the hard slope protection.

Report Sources:

Prunuske Chatham Inc. Vegetated Boulder Revetment Typical Detail. 2001.

Schiechtl, H.M., and R. Stern. Water Bioengineering Techniques. 1997.

Additional Information:

McCullah, John. Bio Draw 1.0, Compendium of Biotechnical Soil Stabilization Solutions. Salix Applied Earthcare. 2000.

Erosion Control Practices Fact Sheet
Willow Wall Revetment (Willow Wall)

Caltrans
New Technology Report

Description:

A willow wall revetment is a living retaining wall that can be used for toe of slope protection and to create planting terraces. The willow wall consists of live or steel posts installed 1 m on center with woven willow branches (weavers) between the posts. An erosion control blanket, brush packing, or both are installed behind the willow wall. The wall is backfilled, creating a terrace for additional plantings. Slopes can be stabilized by creating a series of planted terraces behind the low-growing walls. Live posts and woven branches will sprout with good soil contact. The Willow Wall Revetment is a more stout, taller structure (max. 1 m) than wattle fences used for erosion control (see Live Fascines).

Keywords: Bioengineering, upslope, waterway.

Erosion Control Function:

Willow walls can provide immediate protection against toe and bank scour at the base of cut or fill slopes. Once plants are established, improved cover and soil structure reduce runoff and sediment transport. Breaks up slope length. Can be designed for hillslope sediment trapping. Are derived from traditional wattle fences used historically throughout Europe for landscapes and livestock. Low wattle fences (150 mm) have been used throughout Europe for upslope erosion control to retain small slides or to reapply topsoils.

Effectiveness:

High

Confidence Level in Effectiveness Rating

Medium

Notes:

Reported to be stronger than concrete and rebar due to flexibility, regrowth ability, and intricate root mass.

Specifications:

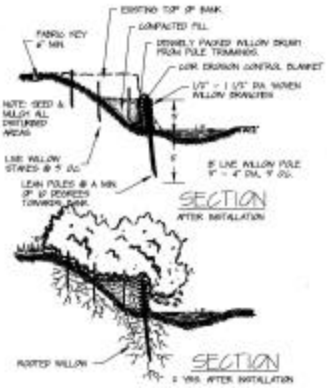
Climate Zone
Mountain
Coastal
Valley

Location
Rural
Urban

Soil Category
Not rocky

Aspect
North
East
South
West

Steepness
Max 1v:1h



Willow Wall Revetment (Willow Wall)

Caltrans BMP ID
PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not Approved

Design Elements:

Channel geometery, sediment transport, and channel hydraulics should be considered if working along streambanks. Can be used to protect cut or fill slopes. Live fascines can be installed behind walls on terraced fills to create sediment filters and slow velocities. Earth anchoring systems can be used with walls that have wet soils or excessive weight. Rock toe protection can be used with walls if needed. Walls can be designed to recreate floodplains. Walls can be used in as stair step terraces. Willows need adequate sunlight and moisture for this practice. Wall height shall not exceed 1 m.

Ancillary Facilities:

Minimal. Willow wall revetments are constructed in place. A source of poles and willow branches near the site is required.

Cost: Medium

$225-$360/ lin. m of stream bank. Cost will depend on grading requirements, willow sources, and if mechanical or hand fill are used.

Erosion Control Practices Fact Sheet
Willow Wall Revetment (Willow Wall)

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Walls should be inspected for soil piping through face of wall and terrace fill. Wall should be checked for movement (overturning) during the wet season in saturated soils. Inspect for plant vigor during the dry season. Temporary irrigation should be used for plant establishment. May need periodic thinning or pruning of lower branches.

Staffing/Equipment

Hand crew.

Project Development:

Construction

Poles can be augered or driven with equipment. Hand crews should collect material during dormant season. Backhoe and excavator are needed to construct terraces.

Construction Complexity High

Constraints

Uses a large volume of plant material to construct. Does not work well in super-saturated soils without earth anchors. If bottom of slope is rocky, poles cannot be driven (use brush mat instead). Willows need adequate sunlight and moisture to grow vigorously. Not appropriate for heavily shaded areas or very dry conditions. May need periodic pruning or thinning. Not suitable for upslope roadside areas.

Advantages

Can be used as a "green" retaining wall. Can be used to trap sediments and create planting beds for successional plant species. Walls can be designed to recreate floodplains and can be used in a stair step fashion for slope stabilization. If necessary, these structures can be constructed without the use of heavy equipment. Once a mature canopy is established, arborescent willows generally become self-pruning in the lower portion of the trunk.

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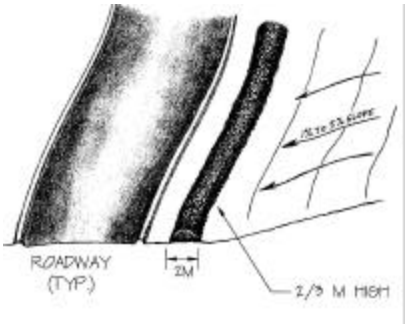
Erosion Control Practices Fact Sheet
Wood Chip Berm

Caltrans
New Technology Report

Description:

Wood chip filter berms placed at the edge of construction area as a temporary sediment filter.



Wood Chip Berm

Erosion Control Function:

On sites where wood chips are readily available from clearing activities, a wood chip berm can be used as a temporary sediment filter in small areas on gentle slopes. Sediment-laden runoff is filtered or detained and allowed to settle out. Efficient on small sites with gentle slopes.

Effectiveness:

Low

Confidence Level in Effectiveness Rating

Low

Notes:

Caltrans BMP ID

None

SWMP Category

II: Temporary

Caltrans Slope Type

Cut
Fill

Status

Not Approved

Design Elements:

Slopes must be 5% or less, with an uphill slope distance of 33 m or less. Berm should be placed on contour. Can also be used as visual or mud tracking barrier. Simple installation by windrowing chipped material and lightly compacting with loader or excavator bucket. The berm shall be maintained at a minimum of 0.67 m in height for the duration of use.

Ancillary Facilities:

Areas of bare soil should be mulched or otherwise protected.

Specifications:

Climate Zone

Mountain
Coastal
Valley
Desert

Location

Rural
Urban

Soil Category

Not rocky

Aspect

N/A

Steepness

Max. 1v:3h

Cost: Low

Erosion Control Practices Fact Sheet
Wood Chip Berm

Caltrans
New Technology Report

Issues and Concerns

Maintenance:

Requirements

Replenish chips as the berm settles to maintain 0.67 m height. At project completion, chips may be removed or spread in a thin layer as mulch.

Staffing/Equipment

Shovel, pitchfork, wheelbarrow, or loader.

Project Development:

Construction

To be practical, materials should be locally available, as well as clean and free of foreign material and/or toxics. Simple loader or excavator construction.

Construction Complexity

Low

Constraints

Wood chips are subject to floating off where there is concentrated runoff or flooding. Chips may need to be removed or distributed on slopes at the time of project completion. Only non-toxic, local plant material should be used. Eucalyptus will inhibit germination and growth of plantings. Chipped lumber, particularly pressure-treated lumber, cannot be used.

Advantages

Where suitable wood chip waste is available for free and slopes are gentle, a wood chip berm is an inexpensive, temporary method to confine, direct, and filter runoff from construction zones. Chips may be spread as mulch at the time of project completion if the practice is approved by the project Landscape Architect. Efficient on small sites with gentle slopes.

Report Sources:

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Prunuske Chatham, Inc.

Additional Information:

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Fact sheets were developed for each erosion control product that was identified. Each fact sheet presents summary information to be used by Caltrans to evaluate the potential applicability of a given product to various Caltrans projects. The information includes a description of the product; discussion of its erosion control function, effectiveness, notes, specifications (location, soil category, steepness, graphic or photo, BMP ID, SWMP category, Caltrans slope type, and status), installation / application, construction complexity, ancillary facilities, construction costs; and consideration of issues and concerns, including maintenance elements (maintenance requirements, staffing / equipment, level of effort), constraints, and advantages. Distributor and manufacturer contact information is followed by their comments regarding their product(s). Each of the above topics included on the fact sheets is discussed below.

B.1 EROSION CONTROL PRODUCT DESCRIPTION

A description of the erosion control product is presented at the top of each fact sheet. The description provides a summary of the product with consistent key words. Keywords will group products together as follows: accessory, biological activity stimulant, bonded fiber matrix, cellular confinement system, fiber roll / wattle / log, flocculator, hydraulic soil stabilizer, hydromulch, hydroseed / mulch additive, rolled erosion control product, sediment barrier, soil / plant amendment, and turf reinforcement mat,.

B.2 EROSION CONTROL FUNCTION

This section discusses how the product works to reduce or correct erosion, sediment, and / or runoff.

B.3 EFFECTIVENESS

Erosion control effectiveness is the ability of a Best Management Practice (BMP) to reduce soil erosion relative to the amount of erosion measured from bare soil.[1] Hydromulch, for example, typically can reduce soil loss by 50-60%. Practice effectiveness is expressed as high, medium, or low using the following criteria:

- *High:* average erosion control percentage was equal to or greater than 70%.
- *Medium:* average erosion control percentage was between 50% and 69%.
- *Low:* average erosion control percentage was below 49%.

[1] Source: *Erosion Control Pilot Study Report,* Caltrans, June 2000, CTSW-RT-00-012, Table 4-1.

B-3.1 Confidence Level of Effectiveness Rating

The level of confidence in the erosion control effectiveness is expressed as high, medium, or low, based on the following criteria:

- *High:* existing data is adequate enough that no field testing will be needed.
- *Medium:* existing data is adequate enough that probably no field testing will be needed.
- *Low:* there is a lack of sufficient information to determine that the product will perform as described by its manufacturer and/or distributor. Field testing will be required.

B.4 NOTES

These notes may qualify effectiveness and level of confidence regarding effectiveness, as well as provide additional information and insights.

B.5 SPECIFICATIONS (PRODUCT DATA)

Specifications (product data) contains available quantitative information about the product's characteristics and performance. Fields regarding appropriate location, soil category, steepness, photo or graphic, Caltrans BMP ID, SWMP category, Caltrans slope type, and status are included. Specifics of each field are discussed below.

B-5.1 Location

Locations where the product may be suitable are described as rural and/or urban.

B-5.2 Soil Category

Soil categories where the product may be suitable are described as rocky and/or not rocky. Rocky soils conform to USDA rockiness classes 3-5 where sufficient bedrock outcrops make the use of agricultural machinery impracticable.[2]

B-5.3 Steepness

Steepness where the product may be suitable is divided into four ratios. If steepness is not defined or not relevant, unknown is listed. Products are rated at their highest applicability. They may be used in less steep conditions.

[2] USDA, 1962. *Soil Survey Manual*. USDA Handbook #18, page 221.

- Max. 1v:3h
- Max. 1v:2h
- Max. 1v:1h
- >1v:1h
- Unknown

B-5.4 Photo or Graphic

When available, a photo or graphic of the erosion control product is included.

B-5.5 Caltrans BMP ID

Many practices do not fit into the prescribed Caltrans BMP IDs. New IDs should be created to better categorize various erosion control practices. Three general categories of permanent construction BMPs have been identified in Table 4-1 of the Caltrans' *Statewide Storm Water Management Plan* (SWMP) (Caltrans, 2001). They include:

- Preservation of Existing Vegetation (PEV)
- Concentrated Flow Conveyance Systems
- Slope / Surface Protection Systems

See Table B-1 below for a list of the permanent construction BMP ID codes used in the facts sheets. In some cases (i.e., SS-2, SS-9, SS-10, etc.), a Caltrans-assigned temporary BMP-ID is used when the practice may also be permanent. Details are found in Caltrans' *Project Planning and Design Guide Manual* (Caltrans, 2000).

Table B-1: Caltrans Approved Permanent Construction BMPs

BMP ID Used in Fact Sheets	BMP Name
Preservation of Existing Vegetation:	
SS-2	Preservation of existing vegetation
Concentrated Flow Conveyance Systems:	
SS-9	Earth dikes / drainage swales & lined ditches
OD	Overside drains
FCES	Flared culvert end sections
SS-10	Outlet protection / velocity dissipation devices
SS-11	Slope drains
Slope/Surface Protection Systems:	
STS	Slope roughening / terracing / rounding
M	Mulching
PSP	Permanent Seeding and Planting
HS	Hard surfaces

Four general categories of temporary construction BMPs have been identified in the *Construction Site Best Management Practices (BMPs) Manual* (Caltrans, 2003). They include:

- Temporary Soil Stabilization (SS)
- Temporary Sediment Control (SC)
- Wind Erosion Control (WE)
- Tracking Control (TC)

See Table B-2 below for a list of the temporary construction BMP ID codes used in the facts sheets. Details are found in Caltrans' *Construction Site Best Management Practices (BMPs) Manual* (Caltrans, 2003).

Table B-2: Caltrans Approved Temporary Construction BMPs

Caltrans BMP ID	BMP Name
Temporary Soil Stabilization:	
SS-1	Scheduling
SS-2	Preservation of existing vegetation
SS-3	Hydraulic mulch, bonded fiber matrix
SS-4	Hydroseeding
SS-5	Soil binders
SS-6	Straw mulch
SS-7	Geotextiles, plastic covers, erosion control blankets / mats, rolled erosion control products (RECP)
SS-8	Wood mulching
SS-9	Earth dikes / drainage swales & lined ditches
SS-10	Outlet protection / velocity dissipation devices
SS-11	Slope drains
Temporary Sediment Control:	
SC-1	Silt fence
SC-4	Check dam
SC-5	Fiber rolls
SC-6	Gravel bag berm
SC-8	Sandbag barrier
SC-9	Straw bale barrier
SC-10	Storm drain inlet protection
Wind Erosion Control:	
WE-1	Wind erosion control
Tracking Control:	
TC-1	Stabilized construction entrance / exit
TC-2	Stabilized construction roadway
TC-3	Entrance / outlet tire wash

B-5.6 SWMP Category

The SWMP category is described as IB: Permanent and II: Temporary. Permanent products will not be removed prior to contract closeout. Temporary products will be removed before contract closeout; they are used to contain erosion during construction only.

B-5.7 Caltrans Slope Type

The Caltrans slope type where the product may be suitable for use is described as cut and fill.

B-5.8 Status

The Caltrans approval status includes:

- Approved Standard Spec
- Approved Special Provisions
- Approved Case by Case
- Not Approved

B.6 INSTALLATION

Discussion of how the product is installed includes general design elements and construction requirements.

B.7 CONSTRUCTION COMPLEXITY

Construction complexity is described as high, medium, or low based on the following criteria:

- *High:* construction will require specialized equipment and / or labor skills.
- *Medium:* construction will require equipment that is readily available and / or journeyman worker skills.
- *Low:* construction will require nominal equipment and / or unskilled labor.

B.8 ANCILLARY FACILITIES

The ancillary facilities section contains supplemental information, for example, if the product will trigger the use of an associated product or practice or require specialized equipment, unusual space, or access considerations.

B.9 CONSTRUCTION COST

Construction costs are assessed using hydromulch with seeding as the standard of comparison. Hydromulch with seeding has an average construction cost of $2,224 to $2,964 per hectare, which is considered low.[3] Construction costs are expressed as high, medium, or low using the following criteria:

- *High:* average construction costs of more than $72,300 per hectare.
- *Medium:* average construction costs of more than $3,211 but less than $72,300 per hectare.
- *Low:* average construction costs of less than $3,211 per hectare.
- *Unknown:* construction costs are unknown.

B.10 ISSUES AND CONCERNS

B-10.1 Maintenance Requirements

The maintenance requirements section summarizes routine maintenance tasks required to keep the product functioning as prescribed.

B-10.2 Maintenance Staffing/Equipment

The maintenance staffing/equipment section identifies the level of staff and the skills required to perform the maintenance, as well as any specialty equipment.

B-10.3 Maintenance Level of Effort

Maintenance costs are assessed using hydromulch with seeding as the standard of comparison. Hydromulch with seeding has a medium level of effort. Maintenance levels are expressed as high, medium, or low using the following criteria:

- *High:* use of product is predicated on frequent maintenance, for example, filter bag clean out.
- *Medium:* routine SWPPP inspections (before, during, and after storm events).
- *Low:* infrequent inspection required; very little maintenance anticipated.

[3] Source: *Erosion Control Pilot Study Report,* Caltrans, June 2000, CTSW-RT-00-012, Table 4-1.

B-10.4 Constraints

This section lists additional constraints of the product that were not covered in the previous sections. Information presented may include impacts from hydrologic characteristics and weather conditions in California, experiences from actual field use, and expansion of particular points discussed in previous sections of the fact sheet.

B-10.5 Advantages

This section highlights product-specific advantages and may list additional advantages that were not covered in the previous sections.

B.11 CONTACT INFORMATION

The contact information section contains details about the product's distributor and / or manufacturer.

B-11.1 Distributor

Distributor's address, phone number, fax number, and website are included.

B-11.2 Manufacturer

Manufacturer's address, phone number, fax number, email, and website are included.

B.12 DISTRIBUTOR'S/MANUFACTURER'S COMMENTS

This section contains direct unevaluated and unedited quotations from the product's distributor and / or manufacturer.

APPENDIX B.2
LIST OF PRODUCTS

Accessory

Aqua-Barrier
BioD-Twine
Conwed Straw Netting
ST-530 Quik-Rok Soil Stabilizer
TerraTex Barrier Fencing 300
Tommy Silt Fence Machine
Wooden Wedges

Biological Activity Stimulant

Endonet
GroLife
Menefee Humate
TurboStart

Bonded Fiber Matrix

Conwed 2500® Bonded Fiber Matrix
Conwed 3000® Bonded Fiber Matrix
Eco-Aegis Bonded Fiber Matrix
Eco-Aegis II Bonded Fiber Matrix
Hydro-Blanket
Soil Guard (BFM)
SprayMatt Bonded Matrix Erosion Fiber

Cellular Confinement System

Coir Geocell
Enviromat EL and EB Lining
Grasspave2
Petraflex Cabled Concrete Liners
TENAX MS Geogrid
TENAX TENWEB 3/200 Geocells
TENAX TENWEB 3/300 Geocells
TENAX TENWEB 4/200 Geocells
TENAX TENWEB 4/300 Geocells
Tri-lock Erosion Control System

Fiber Roll/Wattle/Log

Bio-12 Straw Wattles
Bio-9 Straw Wattles
BioD-Roll (coir roll)
BioD-Watl

Coco Gabion

Fiber Roll/Wattle/Log (con't)

Earth Saver Rice Straw Wattles
En-coir Fiber Log
Excelsior Log
Fiber Log
Hy-Tex CoirLog
KoirLog
Prairie Logs
Restoration Log
Sediment Log
Slope-Gard 1 Fiber Roll
Slope-Gard 3 Fiber Roll Inlet Protector
Straw Log
Straw Wattle Slope Interruption Device
UV-12 Straw Wattles
UV-9 Straw Wattles
Vegetation Fascine – Circular Coir Log
Vegetation Fascine – Square Coir Log

Flocculator

APS 700 Series Silt Stop
APS Floc Log

Hydraulic Soil Stabilizer

APS 600 Series Silt Stop
ASB-45
Atlas SoilLok
CalBinder
Dust-off
EarthBound
Earthguard
Envirotac II
Fisch-Bond
Micronized PAM
MULCHTACK41
PennzSuppress D
PolyPavement
PX-300
R-2400
Road Oyl

Seal
Soil Master WR

Hydraulic Soil Stabilizer (con't)

Soil Seal
Soil-Sement
SOILOC–E
SOILOC–MQ
SOILPAM
SOILPAM L
Terra Control
Top-Seal
VEGECOL
Zip-Seal

Hydromulch

Aspen Fibers Turbo Mulch
Cellulose Fiber
Coir Mulch
Conwed Enviroblend
Conwed Hydro Mulch 1000
Conwed Hydro Mulch 2000
Eco-Fibre
Eco-Fibre + Tac
Enviro-Gro
Excel Fiber Mulch II
Hydro-Spray Mulch
Jet-Spray
Jet-Spray w/Poly-Fibres
Mat-Fiber
Re-Fiber Mix w/TAC
Re-Fiber Wood
Re-Fiber Wood w/TAC
Second Nature Paper Fiber Mulch
Wood Cellulose Fiber
Wood Cellulose w/Poly-Fibres
Wood Cellulose w/Tack III
Wood Cellulose w/Tack III & Poly-Fibres

Hydroseed/Mulch Additive

Co-Polymer Gel
Locking Fibers

Poly-Fibres
R-2400
Slicky Sticky

Hydroseed/mulch Additive (con't)

Tackifibers

Rolled Erosion Control Product

AEC Premier Straw Blankets
BioD-Mat
BioD-Mesh 60
BioD-OCF 30
BioD-Pillow
BioD-SCF Blanket
Biomac T450
Biomac T900
Bon Terra (Landlok) S2
C125 Extended Long Term Blanket
C125BN
CF072RR Double Net Coconut
CFS072B Dbl. Net Straw Coconut
CFS072R Dbl. Net Straw Coconut
Curlex I (single sided)
Curlex II (double sided)
Curlex III (HV)
CY-4 Woven Coir Yarn Geotextile
CY-7 Woven Coir Yarn Geotextile
CY-9 Woven Coir Yarn Geotextile
DS150 Short Term Blanket
DS75 Short Term Blanket
ECS Heavy High Impact Excelsior Mat
ECS High Impact Excelsior Mat
ECS High Velocity Straw Mat
ECS Standard Excelsior Mat
ECS Standard Straw Mat
Enforcer
Florafab F1, F2… F12
Futerra Revegetation Mat
G-Mat
Hy-Tex CoirMesh
Hy-Tex GrassMat
Jute

Jutemaster
JuteMesh
Koirmat 400
Koirmat 700
Koirmat 900

Rolled Erosion Control Product (con't)

Landlok CS2
Landlok ENC2
Landlok S1
RoadRunner
Robex RS1
Robex RS2
Robex RSC-4
Robex RSS C-3
S150 Short Term Blanket
S150BN
S75 Short Term Blanket
S75BN
SB400
SB700
SB900
SC150
SC150BN
TENAX ECOMAT Biomat
TENAX PROMAT Geomat
TerraGuard SS, DS, DSC, and DC
TerraJute
Verdyol® Ero-Mat High Velocity
Verdyol® Ero-Mat Standard
Verdyol® Excelsior High Velocity
Verdyol® Excelsior Standard
WS05 Single Net Straw
WS05B Single Net Straw
WS072 Double Net Straw
WS072B Double Net Straw
XCEL R-1
XCEL SC-3
XCEL SD-3
XCEL SR-1 Straw Blanket
XCEL SS-2

APPENDIX B.2
LIST OF PRODUCTS

Sediment Barrier

BioD-Screen (biodegradable silt fence)
Curlex® SiltTRAP
KoirFence
Mirafi Silt Fence
Sedimat

Sediment Barrier (con't)

Siltsack High Flow
Siltsack Regular Flow
Silttrapper
TerraTex Barrier Fencing 100

Soil/Plant Amendment

Agrolok (gel)
BIOCOL
Co-Polymer Gel
DriWater
EssentialSoil
Fertil-Fibers
FinnHG
FinnHST Humic Acid
Forever Mulch
Geofibers
Growplex-SP
Growth Stimulant
Hy-Tex MulchMat
Hydretain
HydroGel
Hydromax
Kiwi Power
Menefee Humate
Mulching Granules
Rubberiffic Mulch
Seanure SOILBUILDER
Sod Crystals
Stockosorb
StrawNet
TeraFlo
TeraGel
TurfMedic
Vert-Expert

WaterSave

Turf Reinforcement Mat

3DTRM-CC
3DTRMPP
C350 Composite Turf Reinforcement Mat
CF072B Dbl. Organic Net Coconut

Turf Reinforcement Mat (con't)

CFG2000 Geogrid Reinforced Coconut TRM
CT-4 Woven Coir Twine Geotextile
CT-7 Woven Coir Twine Geotextile
CT-9 Woven Coir Twine Geotextile
ECS Earth-Lock
Enkamat 7000 Series
Enkamat 7200 Series
Enkamat 7900 Series
Enkamat S Series
Florafab Sandwich Geotextile
GFP-12 Double Net Synthetic Fiber
KoirBed
Miramat TM8
P300 Synthetic Reinforced Mat
P550 Composite Turf Reinforcement Mat
Permamat Stabilization Blanket XCEL 100
Permamat Stabilization Blanket XCEL 150F
Permamat Stabilization Blanket XCEL 200F
Recyclex Turf Reinforced Matting
SC250 Composite Turf Reinforcement Mat
Slopetame2
TENAX Multimat R Geomat
Tensar TM 3000
TerraGuard 44P
Trinter Double Net Synthetic Fiber

Erosion Control Products Fact Sheet
Endonet

Caltrans
New Technology Report

Description:

Biological activity stimulant.
Soil amendment, my corrhizal inoculant.

Endonet

Erosion Control Function:

Increases biological activity in soil, thereby increasing rooting and plant growth rate. Especially helpful in cut slopes and soils low in organic matter.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Incorporate into soil surface as per manufacturer's directions.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:

Low

Notes:

Specifications (Product Data):

Dry granular mycorrhizal inoculant.
EndoNet mycorrhiza, is packaged in 20-pound sacks and bulk containers. The product can be picked up by the consumer, shipped UPS or by any other option.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Increased plant growth over long term.

Contact Information:

Distributor:

877 777.8327

Website

www.mycorrhiza.com

Manufacturer:

BioNet, LLC.

Email

tstjohn@cosmoaccess.net

Website

http://www.bionetgrows.com/html/bionet.htm

Manufacturer's/Distributor's Comments:

BioNet is a leading educator, producer and distributor of high quality mycorrhizal Inoculum. The information provided in this web site explores the benefits, types, and restoration possibilities as well as, how to purchase this amazing product. In restoration, reclamation, and erosion control, a very important element is the association of mycorrhizal fungi in the soil. When inoculated with EndoNet mycorrhiza, plants not only expand their root system but form an underground network linking the soil and plants into a living ecosystem which expands the plants establishment, improves the soil structure, suppresses root pathogens, reduces drought stress and increases resistance to invasive weeds while raising survival and growth. Dr. Ted's EndoNet mycorrhiza is safe, cost effective, efficient and easy to apply. BioNet's production of EndoNet mycorrhiza with North Tree's restoration support and cutting edge technology will lead to the success of your projects. BioNet's EndoNet mycorrhiza inoculum is ideal for food plants, house plants, turf grass, home gardens, ornamentals, nurseries, landscaping, golf courses, parks, athletic fields, farming applications, restoration and revegetation projects.

Erosion Control Products Fact Sheet
GroLife

Caltrans
New Technology Report

Description:

Biological activity stimulant.
Soil amendment, mycorrhizal inoculant.

No graphic available

GroLife

Erosion Control Function:

Increases biological activity in soil, thereby increasing rooting and plant growth rate. Especially helpful in cut slopes and soils low in organic matter.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Incorporate into soil as per manufacturer's directions. GroLife® should be applied in projects where the following situations occur: Top soil is eroded, exposing lifeless subsoil. Extremely arid conditions. Little or no future maintenance (fertilization, irrigation, etc.) will be occurring on the site.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

GroLife® is a natural product that contains various types of mycorrhizal fungi with an organic soil conditioner. Gro Life® is effective in any type of soil, helping to create a healthy beneficial environment for plants

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Increased plant growth over long term.

Contact Information:

Distributor:

GroPower

Website

Manufacturer:

GroPower
15065 Telephone Avenue
Chino, CA 91710-9614
909 393-3744

Email

gropower@gte.net

Website

http://www.grolife.com/

Manufacturer's/Distributor's Comments:

GroLife® is a natural product that contains various types of mycorrhizal fungi with an organic soil conditioner. GroLife® is effective in any type of soil, helping to create a healthy beneficial environment for plants. When GroLife® is incorporated into the soil, the mycorrhizal fungi will form a symbiotic relationship between the host plants roots and the soil. This relationship, called mycorrhizal, when established will become an extension to the root system. This will increase the surface area of the roots to help in the uptake of nutrients, (especially phosphorous) and will increase growth rate. Research has found that when plants establish this relationship, the chance of survival will greatly increase. The host plant will become more drought tolerant, have greater resistance to root diseases, and can resist the invasion of weeds. The joint venture between Tree of Life Nursery and Gro-Power®, Inc. bring together 55 years of knowledge and experience to produce a product that will effectively enhance the soil environment. This product contains humus, humic acids, micronutrients, and beneficial soil bacteria, along with various endo and ecto mycorrhizal fungi to create a natural ecosystem.

Erosion Control Products Fact Sheet
Menefee Humate

Caltrans
New Technology Report

Description:

Biological activity stimulant.
Soil amendment. Humate is a naturally-occurring organic material that provides quality organic matter in a favorable state of partial decomposition. Its value is in proportion to the concentration of humic acid, its carbon to nitrogen ratio according to the manufacturer.

No graphic available

Menefee Humate

Erosion Control Function:

Increases biological activity in soil, thereby increasing rooting and plant growth rate. Especially helpful in cut slopes and soils low in organic matter.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Installation/Application:

Coarse Textured Soils
Construction, renovation, or preparation of a seedbed is an ideal time to incorporate humate into a root zone. Mix Granular Menefee Humate at 10 pounds/yd.^{3} of soil mixes or backfill mixes in ornamental plantings. During seedbed preparation or prior to sprigging or sodding, incorporate the Menefee Humate into the top 2 inches of the root zone at 500 pounds/acre (11.5 pounds/1000 ft.^{2}).

Notes:

Specifications (Product Data):

Menefee Humate is a superior grade humate, containing a minimum 35% humic acid to a maximum of 80%. It also has a low carbon to nitrogen ratio, promoting immediate and sustained microbial activity/nutrient fixation, contains a minimum of 50% available organic matter and a very low salt index (E.C. = .34 mmhos/cm), and ± 35% available carbon.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Increased plant growth over long term.

Contact Information:

Distributor:

Website

Manufacturer:

Sundine Enterprises
5325 Garland Street
Arvada, CO 80002-2941
800 830-4261

Email

inquiry@sundine.com

Website

http://www.sundine.com

Manufacturer's/Distributor's Comments:

What is it?
Humate is a naturally-occurring organic material that provides quality organic matter in a favorable state of partial decomposition. Its value is in proportion to the concentration of humic acid, its carbon to nitrogen ratio, salt index (E.C. value), and area in which the humate was derived (clay/silt content).

Menefee Humate is a superior grade humate, containing a minimum35% humic acid to a maximum of 80%. It also has a low carbon to nitrogen ratio, promoting immediate and sustained microbial activity/nutrient fixation, contains a minimum of 50% available organic matter and a very low salt index (E.C. = .34 mmhos/cm), and ± 35% available carbon. These physical and chemical characteristics are in relation to the origin of the Menefee Humate formation. Menefee Humate reserves are found in 70 million year old geological formations that once were fresh water lakes and swamps. Thus, their origin and aging, provide a superior grade of humate, that contains no silt or clay, high humic acid content, and has a very low salt index via the fresh water origin.

Menefee Humate is a natural energy source for aerobic microbial activity in soils, providing the driving mechanisms for catalytic processes. Menefee Humate's superior carbon to nitrogen ratio provides an immediate and sustained source of energy for beneficial aerobic microbial activity and nutrient fixation. This activity stimulates catalytic responses providing agronomic benefits such as: chelation of nutrients into exchangeable forms, increased availability of nutrients, effective breakdown of pesticides/herbicides, improved C.E.C. values, and beneficial soil aggregation promoted by increased soil microbial activity.

Erosion Control Products Fact Sheet
TurboStart

Caltrans
New Technology Report

Description:

Biological activity stimulant.
Mycorrhizal inoculant, soil amendment. A mixture of endomycorrhizal spores, host plant roots, and sterilized soil media. Primarily composed of Glomus intradicies. Includes Trichoderma and cytokinin organisms to increase biological activity and regulate growth. Comes in powder form.

No graphic available

TurboStart

Erosion Control Function:

Increases biological activity in soil, thereby increasing rooting and plant growth rate. Especially helpful in cut slopes and soils low in organic matter. Increases biological activity in the root zone. Works especially well in conditions where topsoil has been depleted (cut slopes, etc.) or in sandy soils. Enhances the growth and establishment of plant cover which provides the long term erosion control function.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Broadcast and incorporate into soil.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

A mixture of endomycorrhizal spores, host plant roots and sterilized soil media. Primarily composed of mycorrhizal fungi, Glomus etunicatum and Glomus intradicies. Includes Trichoderma and cytokinin organisms to increase biological activity and regulate growth.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Living organisms require careful storage. Limited shelf life.

Advantages:

Increased plant growth over long term.

Contact Information:
Distributor:

Albright Seed
487 Dawson Drive, Bay 5S
Camarillo, CA 93012
800 423-8112

Website

http://mars.he.net/cgi-bin/suid/~pauldaw/web_store.cgi?page=cat_other_microbial.html&cart_id=4600835.5478

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

TurboStart is a mycorrhizal innoculant, which is considered a biological alternative for the future. It increases absorption of minerals and nutrients and intensifies plant development, survivability, and disease resistance. Promotes drought tolerance, nitrogen fixation, and tolerance to salts. Reduces fertilizer, material, and labor costs. TurboStart is a mixture of endomycorrhizal spores, host plant roots, and sterilized soil media. Primarily composed of mycorrhizal fungi, Glomus etunicatum and Glomus intradicies. Includes Trichoderma and cytokinin organisms to increase biological activity and regulate growth.

Erosion Control Products Fact Sheet
Aqua-Barrier

Caltrans
New Technology Report

Description:

Accessory.
Water inflatable coffer dam.

Aqua-Barrier

Erosion Control Function:

Used to dewater streams or as a dam for sediment basin.

Caltrans BMP ID
None

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Technical assistance and installation consultation are available from a network of authorized Aqua-Barrier trained professionals. As easy as this product is to install, there are minimum site specific requirements. Slope and grade parameters, water depth, water velocity, anticipated water flows and related hydrological standards must be evaluated before applications can be undertaken. When correctly installed, Aqua-Barriers provide effective, affordable protection for waterways, property and people.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Aqua-Barriers are constructed from industrial grade vinyl coated polyester. This fabric is laminated with a base of woven polyester between two layers of flexible polyvinyl chloride. These units can be repaired easily in the field, are reusable and provide for compact storage, transportation and ease of handling.

Aqua-Barriers are manufactured in standard 25 and 150 foot lengths and in 2-, 3-, 4-, 5-, 6-, 7- and even 8-foot heights. Custom sized units are available upon request.

Construction Complexity:

Ancillary Facilities:

Equipment to lift Aqua-Barrier. Water to fill the bags and pumps, hoses, etc. Also need ability to dispose of water once project is completed.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Inspect daily. Repair as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Slope and grade parameters, water depth, water velocity, anticipated water flows and related hydrological standards must be evaluated before applications can be undertaken.

Advantages:

The flexibility and impermeability of a vinyl Aqua-Barrier creates an effective water-tight seal which then allows for the removal, diversion or deflection of surface, flood or contaminated waters.

Contact Information:

Distributor:

Website

Manufacturer:

Aqua-Barrier, Inc.
800 245-0199

Email

Website

http://www.aquabarrier.com

Manufacturer's/Distributor's Comments:

Building upon years of industry knowledge and experience Aqua-Barriers are designed and manufactured in the United States as the next generation of effective water inflatable coffer dams for use in the construction industry... as dependable liquid inflatable containment structures for controlling hazardous materials on land and in the marine environment.... as well as, some of the fastest and easiest to deploy flood fighting and flood mitigation tools available anywhere.

How does an Aqua-Barrier work?
The concept is a simple one that's backed up by the latest in high-tech design and fabrication techniques. Aqua-Barriers are constructed as single tubes with a perforated inner restraint diaphragm running the length of each unit. This is the basic structural element that prevents them from rolling when exposed to unequal water or hydrostatic pressures from the outside. Perhaps the most striking feature on Aqua-Barriers are the industrial grade threaded fittings used as fill and drain ports on each unit. Manufactured from rigid PVC and available in sizes from 2 to 6-inches in diameter, these ports are conveniently installed on the top and bottom sides of all Aqua-Barriers. Using standard size hose and adapters the installation and removal of an Aqua-Barrier coffer dam, containment structure or temporary flood wall is quickly and easily accomplished. When filled to their recommended height these mass and gravity-based units are able to conform to various types of terrain and stream bed materials. The flexibility and impermeability of a vinyl Aqua-Barrier creates an effective water-tight seal which then allows for the removal, diversion or deflection of surface, flood or contaminated waters.

Erosion Control Products Fact Sheet
BioD-Twine

Caltrans
New Technology Report

Description:

Accessory lashing rope for fiber rolls/wattles/logs.

No graphic available

BioD-Twine

Erosion Control Function:

Used to cross tie and secure fiber rolls/wattles/logs.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Fiber rolls may be secured with rope restraints as follows: Install stakes on alternate side of roll, 600cm apart. Lash across rolls with 6mm or larger BioD-Twine using a tight clove hitch. Drive stakes with lashing until fiber rolls are cinched down.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

BioD-Twine, coir twine, is made from machine twisted bristle coir fiber. 6mm diameter.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Natural fibers biodegrade over time.

Advantages:

Natural fibers biodegrade over time.

Contact Information:
Distributor:

Website

Manufacturer:

Rolanka
800 760-3215

Email

Website

http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

BioD-Twine, coir twine, is made from machine twisted bristle coir fiber. This natural, biodegradable, yet strong and durable coir twine has numerous applications in agriculture, soil bioengineering and landscaping. Coir twine is available in spools (3 mm & 6 mm diameters) for regular use and hydraulically pressed bales (regular & heavy) for hop industry.

Erosion Control Products Fact Sheet
Conwed Straw Netting

Caltrans
New Technology Report

Description:

Accessory.
Geotextile. Straw netting. Plastic netting for holding down straw mulch.

Conwed Straw Netting

Erosion Control Function:

Used to enhance installation of erosion control products.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Prepare a smooth raked surface, free from rocks, clumps and anything else which will prevent the close contact of the loose mulch and netting to the ground. Secure with staples or pins with overlaps as per manufacturer's recommendations.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Improves product effectiveness in critical situations.

Specifications (Product Data):

Netting: Polypropylene
Strand count: 1.375 x 1.3 / sq inch
Square mesh opening: 3/4" x 3/4" opening
Netting weight: 2.875 / 1000 sq ft
Two widths:
3 1/2 feet wide 3,000' wgt 39 lbs 1,166 sq yards
7 feet wide 3,000' wgt 79 lbs 2,333 sq yards
Netting packaged: 4" kraft core, 1/2" wall core

Construction Complexity: Low

Ancillary Facilities:

Used on top of straw or other mulch. Secure with staples or pins.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic netting entraps animals and may lift up as plants grow. Photo degradability is reduced with increased plant cover.

Advantages:

May improve effectiveness of erosion control product.

Contact Information:
Distributor:

Conwed Fibers, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Conwed Erosion Control Netting is designed to control erosion in areas that have been seeded and mulched with straw, hay, shredded bark, or wood chips. This economical, durable plastic netting effectively reduces the effects of wind and rain in critical areas such as slopes and ditch bottoms. Working with a net can save time and money.

Erosion Control Products Fact Sheet
ST-530 Quik-Rok Soil Stabilizer

Caltrans
New Technology Report

Description:

Accessory.
Expanding prepolymer urethane grout. It is also used as a locking agent for soil and rock anchors as well as soil nails.

No graphic available

ST-530 Quik-Rok Soil Stabilizer

Erosion Control Function:

Decreases sediment runoff by binding soil nails and rocks in place. Grout fills space between anchors/nail and soil.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

See manufacturer's instructions.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Uncured ST-530 is a dark brown liquid with a viscosity of about 140 cps at 25 C (77 F). This low viscosity is further reduced after addition of ST-531. ST-530 contains non-volatile materials making up almost 100% of its total weight. Cured ST-530 is semi-rigid. Its solid is a cross-linked molecular structure which is insoluble in water. The density is 9.4 lbs/gal.

Construction Complexity: Medium

Ancillary Facilities:

Use with soil nails, rocks or other specified materials

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Unknown

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

May require special injector.

Advantages:

Lightweight, rapid cure.

Contact Information:

Distributor:

Website

Manufacturer:

Strata Tech, Inc.
3601 104th Street
Des Moines, IA 50322
515 251-7770

Email

wjaques@strata-tech.com

Website

http://www.strata-tech.com

Manufacturer's/Distributor's Comments:

ST-530 Quik-Rok Soil Stabilizer is a highly expansive, two component system that is catalyzed by water to form a rigid hydrophobic foam solid. ST-530 is used as a soil stabilizer, a rapid water cutoff tool, a temp orary water stop to enable other repairs, and as the locking agent for soil and rock anchors and soil nails. ST-530 is an expanding urethane prepolymer grout that reacts with water and sets into a rigid, closed cell foam. ST-530 is mixed with ST-531 at the work site to form a single injection material whose reaction time with water is governed by the concentration of ST-531.

Erosion Control Products Fact Sheet
TerraTex Barrier Fencing 300

Caltrans
New Technology Report

Description:

Accessory.
Plastic fencing used to preserve existing vegetation.

TerraTex Barrier Fencing 300

Erosion Control Function:

Used to preserve existing vegetation.

Caltrans BMP ID
SS-2

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

TerraTex Barrier FencingTM is available pre-assembled or in fabric rolls. The pre-assembled fence has hardwood posts already attached to the TerraTex Barrier FencingTM with heavy duty industrial staples. The fabric rolls can be easily attached to pre-set wooden or metal posts by using plastic ties or other fasteners.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Improves product effectiveness in critical situations.

Specifications (Product Data):

TerraTex Barrier FencingTM is constructed of a UV stabilized, safety orange fabric woven from polypropylene yarns.

Construction Complexity: Low

Ancillary Facilities:

Workers must be instructed not to remove fence to access protected area without approval of engineer.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Replace and repair as needed.

Maintenance Staffing/Equipment:

Laborer

Maintenance Level of Effort:

Low

Constraints:

This is primarily a visual barrier which can easily be knocked over by heavy equipment. Workers must be instructed not to remove fence to access protected area without approval of engineer.

Advantages:

Lightweight and easy to install. May be reused. May improve effectiveness of erosion control by protecting existing vegetation and soils from disturbance by vehicles and machinery.

Contact Information:
Distributor:

Website

Manufacturer:

Webtec, Inc. Geosynthetics
Charlotte, NC 28219
800 438 - 0027

Email

Website

http://webtecgeos.harborwebs.com/

Manufacturer's/Distributor's Comments:

TerraTex Barrier Fencing 300 - extruded plastic with rectangular openings. The bright color of the fabric and laminated bands make the TerraTex Barrier FencingTM highly visible.

The TerraTex Barrier FencingTM is manufactured to be durable in all weather conditions and is designed to span the duration of most projects. The light weight flexible material facilitates handling, installation and storage. The economical pricing makes it affordable for any application.

Erosion Control Products Fact Sheet
Tommy Silt Fence Machine

Caltrans
New Technology Report

Description:

Accessory.
Silt fence machine.

Tommy Silt Fence Machine

Erosion Control Function:

Facilitates the correct installation of synthetic silt fence which physically blocks the transport of sediment.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions and any drawings for proper installation. Generally, silt fence should be trenched into soil.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Tractor attachment.

Construction Complexity: Medium

Ancillary Facilities:

Specialized installation equipment may improve effectiveness. Attaches to a tractor with a 3 point hitch.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Silt fence must be installed on contour in most applications. Equipment rollover potential increases on steeper slopes. If not installed on contour, sheet water flow may concentrate following the fence trench and create gullies.

Advantages:

Silt fences are often installed incorrectly. This device helps to insure correct installation, providing layout is correct.

Contact Information:
Distributor:

Website

Manufacturer:

Tommy Silt Fence Machine
Akeny, Iowa 50021
800 965-4665

Email

tom@tommy-sfm.com

Website

http://www.tommy-sfm.com/

Manufacturer's/Distributor's Comments:

Install 500 feet of silt fence in 8 minutes! 12" deep, compacted, and locked in the soil.

The Tommy mechanically installs silt fence for consistent, effective results —
Silt fence 8-12 inches deep in the soil
Silt fence stretched tight for a professional appearance
Silt fence embedded tight in the ground nearly eliminating washouts
Silt fence properly placed in nearly every soil type and terrain

Erosion Control Products Fact Sheet
Wooden Wedges

Caltrans
New Technology Report

Description:

Accessory.
Specialized wood stakes for installing fiber rolls and biotechnical slope protection.

Wooden Wedges

Erosion Control Function:

Used to enhance installation of erosion control products.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Depending on soil type and length of stake, pneumatic driver may be needed. Otherwise sledgehammers will work.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Improves product effectiveness in critical situations.

Specifications (Product Data):

Diagonally cut pine wedges available in following sizes.
1" x 1.25" x 8"
1" x 1.25" x 12"
1.5" x 2" x 18"
1.5" x 2" x 24"
2" x 4" x 36"
2" x 4" x 48"
See manufacturer's comments for more information.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Inspect and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Proper installation is critical.

Advantages:

May improve effectiveness of erosion control product by wedging into the coir fiber as the stake is pounded into place.

Contact Information:
Distributor:

Website

Manufacturer:

Rolanka
800 760-3215

Email

Website

http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

Diagonally cut pine wedges to install coir rolls, coir wattles and erosion control blankets. The 48", 36", 24" and 18" long wooden wedges are available with a drilled hole near the top on the diagonal side of the wedge to fasten a nail to support coir rolls and coir wattles
RoLanka also offers oak stakes for coir roll, willow wattle installation, and other landscaping needs.
RoLanka wooden stakes are available in
1.5" x 1.5" x 36"
1.5" x 1.5" x 48"
2" x 2" x 36"
2" x 2" x 48"

Erosion Control Products Fact Sheet
Coir Geocell

Caltrans
New Technology Report

Description:

Cellular confinement system.
20cm-wide bands of tightly woven coir geotextiles.

No graphic available

Coir Geocell

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Must be installed as per engineer and manufacturer specifications. Use for earth retention, slope protection, channel protection. 20cm-wide bands of tightly woven coir geotextiles can be laid in a honeycomb cell like structure using biostakes. The structure can then be filled with soil and saplings planted in them.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

NATURAL AND ORGANIC
(Made from coconut fiber)
ECOFRIENDLY & BIODEGRADABLE.
(Degrades in around two years.)
DISINTEGRATES TO FORM HUMUS.
(Adds 2 Tons of nutrients per acre on decomposition)
RESISTANT TO ROT, MOLDS, MOISTURE.
(Retains 20% of its strength even after one year in soil. 40% when comp letely immersed in water and 50% when used under the sea)
Weight: 205 to 350 gm/m2

Construction Complexity: Medium

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Coir decomposes over time.

Advantages:

Can minimize compaction and the importing of fill. Made of all natural fibers.

Contact Information:

Distributor:

Website

Manufacturer:

Florafab, SONA ENTERPRISES
208 379 8794 fax

Email

Website

http://www.florafab.com/coir.html

Manufacturer's/Distributor's Comments:

Coir Geocells: 20cm wide bands of tightly woven coir geotextiles can be laid in a honeycomb cell like structure using biostakes. The structure can then be filled with soil and saplings planted in them. The product can be used for lining canals, stream banks and on embankments. It may also be used in conjunction with coir fascines in high flow velocity channels for quick vegetation establishment.

Erosion Control Products Fact Sheet
Enviromat EL and EB Lining

Caltrans
New Technology Report

Description:

Cellular confinement system.
Used as bank protection and channel lining. Enviromat Linings are comprised of concrete-filled elements and unfilled areas that allow for the establishment of vegetation.

Enviromat EL and EB Lining

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
HS

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Follow engineer's and manufacturer's specifications. In general, smooth slope, install toe trench, lay out product, fill with cement.

Once the concrete sets, the unfilled and interwoven areas are opened by cutting the fabric and are planted or are filled with topsoil and seeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Products:	EL250	EL400	EB300	EB500
Average Thickness, mm	64	102	76	127
Mass Per Unit Area, kg/m2	138	220	165	275
Open Vegetated Area, %	35	35	20	20
Concrete Coverage, m2/m3	14.6	9.1	12.1	7.3
Shear Resistance, kg/m2	49	78	59	98

Construction Complexity: Medium

Ancillary Facilities:

Requires heavy equipment and concrete pumper.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Concrete fill in waterways requires special permitting. Not as permeable as other materials. Repairs may require heavy equipment.

Advantages:

Rapid construction compared to concrete walls. Planting holes can be provided through the structure.

Contact Information:

Distributor:

Website

Manufacturer:

Hydrotex
800 253-0561

Email

Website

http://www.hydrotex.com/

Manufacturer's/Distributor's Comments:

Enviromat Linings are installed to provide protection against periodic high flows. After installation, vegetation can be planted within the open structure of the lining.

Enviromat Linings are used in drainage ditches and on the upper slopes of channels, canals, lakes, reservoirs, rivers, and other water courses as well as for embankments subject to heavy run-off. Enviromat Linings are comprised of concrete-filled elements and unfilled areas that allow for the establishment of vegetation. Once the concrete sets, the unfilled and interwoven areas are opened by cutting the fabric and are planted or are filled with topsoil and seeded. Within a growing season a vegetated cover will normally extend over the lining, resulting in an erosion control system with the hydraulic, ecological and aesthetic features desired.

EL Linings have a greater open area than EB, so a vegetated cover will be established more rapidly. EB Linings can articulate and are more tolerant of uneven settlement after installation.

Erosion Control Products Fact Sheet
Grasspave2

Caltrans
New Technology Report

Description:

Cellular confinement system.
Cellular confinement system with sediment pollution filtration function. Porous paving supports vegetation where vehicular traffic is allowed. Allows vegetation to filter pollutants from vehicles.

Grasspave2

Erosion Control Function:

Physically blocks the transport of sediment and other pollutants while allowing water infiltration thereby reducing water concentration which could otherwise cause gullying or in-stream scour.

Caltrans BMP ID
None

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Excavate for base course as determined by soils and loading requirements. Place and compact sandy gravel which should be a mixture of clean, sharp sand and gravel varying in size but not exceeding 3/4". To check porosity, use a hose to see that water flows into the base and drains away. Add subsurface drainage as necessary to low spots.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The Grasspave2 system is comprised of a sandy gravel base course, Hydrogrow polymer-fertilizer mixture, the Grasspave2 ring and grid structure, sharp concrete sand, and grass seed or sod.
Grasspave2's high compressive strength, 5721 psi, make it perfect for green firelanes. A firetruck outrigger will exert only about one-fifth of capacity.
100% recycled plastic rings are molded onto non-woven geotextile filter fabric.

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Weed control may be an issue in certain applications.

Advantages:

Reduces concentration of runoff, filters pollutants, prevents soil compaction, increases rooting area for plants. Made from recycled materials.

Contact Information:
Distributor:

Website

Manufacturer:

Invisible Structures, Inc.
20100 E. 35th Drive
Aurora, CO 80011-8160
800 233-1510

Email

sales@invisiblestructures.com

Website

http://www.invisiblestructures.com/

Manufacturer's/Distributor's Comments:

Parking lots and paved areas create large impermiable surfaces that collect petrochemicals from vehicles. In addition, runoff from these surfaces is concentrated, which may cause soil erosion and in-stream scour. By creating a structurally sound, porous vegetated parking lot, pollutants can be filtered through the vegetation, and coarse substrate and runoff concentrations are reduced. With the patented ring system, not only is Grasspave2 the strongest shape, but it also has by far the greatest area for root development. This horticultural difference means longevity and the best chance for durability and recovery under stress. The grass roots will penetrate the sandy grave roadbase required for all pavements regardless of product choice. We create a road with grass as its surface.

Preventing compaction is the number one objective of our system. Tires of any size and load (pounds per square inch), feet of any size, wheelchairs, strollers and golf carts all exert forces which are easily handled by our ring walls. The small size and thickness of rings provide many contact points to transfer weight to the base course below while minimizing compaction of the upper root zone and stabilizing the root system.

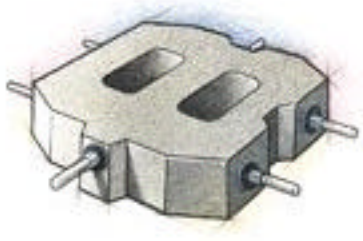
Gravel base course, depth specified by a soils engineer, is laid underneath to bear vehicle loading, Gravelpave2 is unrolled and fastened together with washers included, then filled with decorative gravel of minus 5mm (3/16") using a front end loader and rakes. Settling of fill gravel can be done by either compacting with a roller or irrigating with water.

Erosion Control Products Fact Sheet
Petraflex Cabled Concrete Liners

Caltrans
New Technology Report

Description:

Cellular confinement system.
Cabled concrete matresses for permanent channel liners and slope protection. Hardscape.



Petraflex Cabled Concrete Liners

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
HS

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Follow engineer's and manufacturer's specifications. In general, smooth slope, install toe trench, install filter fabric, lay out and secure cabled concrete liners. Plants may be installed in openings.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Specific Weight: 130 to 150 lbs./cu.ft.
Compressive Strength: 4,000 psi
Maximum Absorption: 7%
Note: Above dimensions are nominal. Above unit styles available without vertical cells.

The assembled mattresses shall have a range of 18 to 23 percent open area to be achieved by penetrations within the block. Two (2) integral longitudinal cables per block are required, as well as one (1) integral transverse cable.

Construction Complexity: Medium

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Concrete fill in waterways requires special permitting. Repairs may require heavy equipment.

Advantages:

Can minimize compaction and the importing of fill. Easily constructed, durable, flexible, and permeable erosion protection system. Plants may be installed in openings.

Contact Information:
Distributor:

Website

Manufacturer:

Petratech
4444 West 78th Street
Minneapolis , MN 55435
800 787-2359

Email

info@petraflex.com

Website

http://www.petraflex.com/pages/petraflex_pages/petrafr ame.html

Manufacturer's/Distributor's Comments:

The Petraflex® cabled erosion control revetment system has been proven in the laboratory and the field as a technical and economical improvement over traditional forms of erosion control. By virtue of their large unit mass and longitudinal and lateral corrosion resistant cables, Petraflex® mattresses provide an easily constructed, durable, flexible, and permeable erosion protection system.

The Petraflex® system was developed to provide a superior armored surface for long term erosion control. Petraflex® mattresses are placed on geotextile fabric which provides permeability through the revetment system. The interlocking units and two-way corrosion resistant cables allow the Petraflex® system to articulate with unequaled strength and stability. This stability is important on channel bends or curves where angle or wedge mattresses are used. Lateral cable connections between angle mattresses and adjacent mattresses ensure continuous strength throughout the entire revetment system. This unique feature provides the system integrity necessary for maintenance-free long term erosion protection.

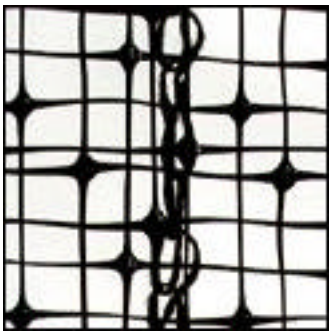
Cellular Concrete Mattresses shall be Petraflex® or approved equal. Petraflex® can be obtained from Industrial Fabrics, Inc. (Petraflex® Division) at 713/862-2269 or 225/273-9600. Cellular concrete mattresses shall be pre-manufactured as and assembly of concrete blocks when connected into mattresses by the use of revetment cables. The assembled mattresses shall have a range of 18 to 23 percent open area to be achieved by penetrations within the block. Two (2) integral longitudinal cables per block are required, as well as one (1) integral transverse cable.

Erosion Control Products Fact Sheet
TENAX MS Geogrid

Caltrans
New Technology Report

Description:

Cellular confinement system.
Synthetic muliti-layer geogrid soil stabilizer.



TENAX MS Geogrid

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
HS

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Must be installed as per engineer and manufacturer specifications. Use for earth reinforced fill and other soil retention applications.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Polymer: Polypropylene.
Standard colour: black.
U.V. protection: carbon black.
Unit weight: 315 g/m².

Construction Complexity: High

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: High

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require surface mulch.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Fill material within cells may be washed out in steep slope application if temporary cover is not provided.

Advantages:

Lightweight materials. Can minimize compaction and the importing of fill.

Contact Information:
Distributor:

Website

Manufacturer:

Tenax
Baltimore, MD
800 356-8495

Email

Website

http://www.tenax.net/geosynthetics/products/tenax_ms.htm

Manufacturer's/Distributor's Comments:

TENAX MS is a polypropylene (PP) composite geogrid obtained by combining a certain number of layers of one or more geogrids. It is a modular product that can be manufactured with different strengths and properties that may be required for any particular project. Standard geogrids are manufactured by combining up to 5 layers of a lightweight flexible geogrids. The number of strands allows for a very uniform distribution of stress conditions very similar to the "root effect," which makes TENAX MS particularly suitable for the reinforcement of fine and weak soils. By combining a number of grid layers, a geogrid with considerable resistance can be produced, capable of withstanding very intense loads or of stabilizing soils having openings and cavities produced by localized settlement (for example, Karst soils, permafrost, and mining areas).

Erosion Control Products Fact Sheet
TENAX TENWEB 3/200 Geocells

Caltrans
New Technology Report

Description:

Cellular confinement system.
Synthetic cellular confinement soil stabilizer. TENAX TENWEB geocells are honeycomb-shaped structures with a thickness ranging from 75 to 150 mm that are made by the continuous extrusion of polyethylene (PE) and without any welding.

TENAX TENWEB 3/200 Geocells

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Must be installed as per engineer and manufacturer specifications. Use for earth retention, slope protection, load support, channel protection.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The geocells shall be manufactured in accordance with the Quality Assurance requirements ISO 9002:94.
Polymer: Polyethylene. Standard colour: green.
U.V. protection: HALS. Unit weight: 1150 g/m².
Thickness: 75 mm. Cell inner diameter: 200 mm.
Tensile Strength: expressed as typical value, shall be 1.20 kN/strip with a peak strain of around 15.0 % approximately, when tested on a single strip between two junctions at an extension rate of 300 mm/min at 20 C.
Junction Tensile Shear Resistance: shall be not less than 0.80 kN/junction when tested on single strip with junction loaded in shear at an extension rate of 300 mm/min at 20 C.

Construction Complexity: High

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: High

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require surface mulch.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Fill material within cells may be washed out in steep slope application if temporary cover is not provided.

Advantages:

Lightweight, easy to transport. Can minimize compaction and reduce the need for imported fill. May be used in place of rock. May be revegetated.

Contact Information:

Distributor:

Website

Manufacturer:

Tenax
Baltimore, MD
800 356-8495

Email

Website

http://www.tenax.net/geosynthetics/products/tenax_tenweb.htm

Manufacturer's/Distributor's Comments:

TENAX TENWEB geocells open like an accordion and therefore can be transported and stored with minimal space and successively opened during installation, thus creating a series of completely interconnected, regular ovoid cells (diameter ranging from 100 to 300 mm). Once expanded to its maximum extension and filled in with soil (or pea gravel, concrete, etc.), the structure becomes inextensible and monolithic. This provides an effective means of confinement for unconsolidated materials lying within single cells, preventing their movement even on steep slopes or from substantial dragging forces such as those exerted by hydraulic currents. The cellular structure is particularly useful on arid, rocky, or impermeable soils where vegetation is almost or totally lacking. The structure's junctions have a central opening through which water can pass so that effectively all the cells are hydraulically interconnected. The geocells/soil composite structure attains good permeability, facilitates the absorption of water during precipitation, and diminishes surface runoff and, consequentially, erosion of meteorological origin. Utilizing TENAX TENWEB geocells, it is possible to confine a topsoil layer (up to 150 mm) on steep slopes, which allows planting of the escarpment with high degree of confidence and success.

Erosion Control Products Fact Sheet
TENAX TENWEB 3/300 Geocells

Caltrans
New Technology Report

Description:

Cellular confinement system.
Synthetic cellular confinement soil stabilizer
TENAX TENWEB geocells are honeycomb -shaped structures with a thickness ranging from 75 to 150 mm that are made by the continuous extrusion of polyethylene (PE) and without any welding.

TENAX TENWEB 3/300 Geocells

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Must be installed as per engineer and manufacturer specifications. Use for earth retention, slope protection, load support, channel protection.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The geocells shall be manufactured in accordance with the Quality Assurance requirements ISO 9002:94.
Polymer: Polyethylene. Standard color: green.
U.V. protection: HALS. Unit weight: 800 g/m².
Thickness: 75 mm. Cell inner diameter: 300 mm.
Tensile Strength: expressed as typical value, shall be 1.20 kN/strip with a peak strain of around 15.0 % approximately, when tested on a single strip between two junctions at an extension rate of 300 mm/min at 20 C.
Junction Tensile Shear Resistance: shall be not less than 0.80 kN/junction when tested on single strip with junction loaded in shear at an extension rate of 300 mm/min at 20 C.

Construction Complexity: High

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: High

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require surface mulch.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Fill material within cells may be washed out in steep slope application if temporary cover is not provided.

Advantages:

Lightweight, easy to transport. Can minimize compaction and reduce the need for imported fill. May be used in place of rock. May be revegetated.

Contact Information:
Distributor:

Website

Manufacturer:

Tenax
Baltimore, MD
800 356-8495

Email

Website

http://www.tenax.net/geosynthetics/products/tenax_tenweb.htm

Manufacturer's/Distributor's Comments:

TENAX TENWEB geocells open like an accordion and therefore can be transported and stored with minimal space and successively opened during installation, thus creating a series of completely interconnected, regular ovoid cells (diameter ranging from 100 to 300 mm). Once expanded to its maximum extension and filled in with soil (or pea gravel, concrete, etc.), the structure becomes inextensible and monolithic. This provides an effective means of confinement for unconsolidated materials lying within single cells, preventing their movement even on steep slopes or from substantial dragging forces such as those exerted by hydraulic currents. The cellular structure is particularly useful on arid, rocky, or impermeable soils where vegetation is almost or totally lacking. The structure's junctions have a central opening through which water can pass so that effectively all the cells are hydraulically interconnected. The geocells/soil composite structure attains good permeability, facilitates the absorption of water during precipitation, and diminishes surface runoff and, consequentially, erosion of meteorological origin. Utilizing TENAX TENWEB geocells, it is possible to confine a topsoil layer (up to 150 mm) on steep slopes, which allows planting of the escarpment with high degree of confidence and success.

Erosion Control Products Fact Sheet
TENAX TENWEB 4/200 Geocells

Caltrans
New Technology Report

Description:

Cellular confinement system.
Synthetic cellular confinement soil stabilizer. TENAX TENWEB geocells are honeycomb-shaped structures with a thickness ranging from 75 to 150 mm that are made by the continuous extrusion of polyethylene (PE) and without any welding.

TENAX TENWEB 4/200 Geocells

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Must be installed as per engineer and manufacturer specifications. Use for earth retention, slope protection, load support, channel protection.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The geocells shall be manufactured in accordance with the Quality Assurance requirements ISO 9002:94.
Polymer: Polyethylene. Standard color: green.
U.V. protection: HALS. Unit weight: 1600 g/m².
Thickness: 100 mm. Cell inner diameter: 200 mm.
Tensile Strength: expressed as typical value, shall be 1.20 kN/strip with a peak strain of around 15.0 % approximately, when tested on a single strip between two junctions at an extension rate of 300 mm/min at 20 C.
Junction Tensile Shear Resistance: shall be not less than 0.80 kN/junction when tested on single strip with junction loaded in shear at an extension rate of 300 mm/min at 20 C.

Construction Complexity: High

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: High

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require surface mulch.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Fill material within cells may be washed out in steep slope application if temporary cover is not provided.

Advantages:

Lightweight, easy to transport. Can minimize compaction and reduce the need for imported fill. May be used in place of rock. May be revegetated.

Contact Information:

Distributor:

Website

Manufacturer:

Tenax
Baltimore, MD
800 356-8495

Email

Website

http://www.tenax.net/geosynthetics/products/tenax_tenweb.htm

Manufacturer's/Distributor's Comments:

TENAX TENWEB geocells open like an accordion and therefore can be transported and stored with minimal space and successively opened during installation, thus creating a series of completely interconnected, regular ovoid cells (diameter ranging from 100 to 300 mm). Once expanded to its maximum extension and filled in with soil (or pea gravel, concrete, etc.), the structure becomes inextensible and monolithic. This provides an effective means of confinement for unconsolidated materials lying within single cells, preventing their movement even on steep slopes or from substantial dragging forces such as those exerted by hydraulic currents. The cellular structure is particularly useful on arid, rocky, or impermeable soils where vegetation is almost or totally lacking. The structure's junctions have a central opening through which water can pass so that effectively all the cells are hydraulically interconnected. The geocells/soil composite structure attains good permeability, facilitates the absorption of water during precipitation, and diminishes surface runoff and, consequentially, erosion of meteorological origin. Utilizing TENAX TENWEB geocells, it is possible to confine a topsoil layer (up to 150 mm) on steep slopes, which allows planting of the escarpment with high degree of confidence and success.

Erosion Control Products Fact Sheet
TENAX TENWEB 4/300 Geocells

Caltrans
New Technology Report

Description:

Cellular confinement system.
Synthetic cellular confinement soil stabilizer. TENAX TENWEB geocells are honeycomb-shaped structures with a thickness ranging from 75 to 150 mm that are made by the continuous extrusion of polyethylene (PE) and without any welding.

TENAX TENWEB 4/300 Geocells

Erosion Control Function:

Physical barriers used to hold soil in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Must be installed as per engineer and manufacturer specifications. Use for earth retention, slope protection, load support, channel protection.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The geocells shall be manufactured in accordance with the Quality Assurance requirements ISO 9002:94.
Polymer: Polyethylene. Standard color: green.
U.V. protection: HALS. Unit weight: 1100 g/m².
Thickness: 100 mm. Cell inner diameter: 300 mm.
Tensile Strength: expressed as typical value, shall be 1.20 kN/strip with a peak strain of around 15.0 % approximately, when tested on a single strip between two junctions at an extension rate of 300 mm/min at 20 C.
Junction Tensile Shear Resistance: shall be not less than 0.80 kN/junction when tested on single strip with junction loaded in shear at an extension rate of 300 mm/min at 20 C.

Construction Complexity: High

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: High

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require surface mulch.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Fill material within cells may be washed out in steep slope application if temporary cover is not provided.

Advantages:

Lightweight, easy to transport. Can minimize compaction and reduce the need for imported fill. May be used in place of rock. May be revegetated.

Contact Information:

Distributor:

Website

Manufacturer:

Tenax
Baltimore, MD
800 356-8495

Email

Website

http://www.tenax.net/geosynthetics/products/tenax_tenweb.htm

Manufacturer's/Distributor's Comments:

TENAX TENWEB geocells open like an accordion and therefore can be transported and stored with minimal space and successively opened during installation, thus creating a series of completely interconnected, regular ovoid cells (diameter ranging from 100 to 300 mm). Once expanded to its maximum extension and filled in with soil (or pea gravel, concrete, etc.), the structure becomes inextensible and monolithic. This provides an effective means of confinement for unconsolidated materials lying within single cells, preventing their movement even on steep slopes or from substantial dragging forces such as those exerted by hydraulic currents. The cellular structure is particularly useful on arid, rocky, or impermeable soils where vegetation is almost or totally lacking. The structure's junctions have a central opening through which water can pass so that effectively all the cells are hydraulically interconnected. The geocells/soil composite structure attains good permeability, facilitates the absorption of water during precipitation, and diminishes surface runoff and, consequentially, erosion of meteorological origin. Utilizing TENAX TENWEB geocells, it is possible to confine a topsoil layer (up to 150 mm) on steep slopes, which allows planting of the escarpment with high degree of confidence and success.

Erosion Control Products Fact Sheet
Tri-lock Erosion Control System

Caltrans
New Technology Report

Description:

Cellular confinement system.
Revetment made of interlocking pre-cast concrete blocks.

Tri-lock Erosion Control System

Erosion Control Function:

Hard surface, flexible physical barriers used to hold soil in place while allowing vegetation to grow.

Caltrans BMP ID
HS

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

The Tri-Lock system is easy to install. No special installation equipment or experience is required. Tri-Lock revetment systems are normally backfilled with topsoil at the rate of 1 cu. yd. of topsoil to 200 sq. ft. If revegetation is not being considered, then the revetment may be backfilled to an average of 1" cover protecting the filter fabric against UV rays. This backfilling should be executed within 14 days of the completion of revetment. Average material required will be 1 yd. to 500 sq. ft.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Tri-lock	4010	4015
Height	4 inches	6 inches
Module	16 inches	16 inches
Weight per sq. ft.	32 lbs	45 lbs.
Weight per Block Pair	50 lbs.	70 lbs.
Concrete Strength	4000 psi	4000 psi
Open Area (approx.)	20%	20%

Construction Complexity: Medium

Ancillary Facilities:

May require heavy equipment.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair. May require heavy equipment if damaged.

Maintenance Level of Effort:

Medium

Constraints:

Unknown

Advantages:

Can minimize compaction and the importing of fill. Flexible hard armor that allows for vegetation establishment.

Contact Information:

Distributor:

Website

Manufacturer:

CCI Industries, LTD
PO Box 94580

Richmond, BC V6Y 2V6

Email

coast@cci-industries.com

Website

http://www.cci-industries.com/Pages/Tri-Lock.html

Manufacturer's/Distributor's Comments:

The TRI-LOCK EROSION CONTROL SYSTEM represents the most advanced and versatile system in the erosion control industry. TRI-LOCK provides the engineered alternative to conventional erosion control materials for revetment and environmentally sound method of combating severe erosion problems.

Tri-Lock is a flexible, permeable erosion control system that has the capacity to allow re-vegetation. It employs a superior, specially engineered woven filter fabric in combination with a interlocking articulated concrete block armor. Tri-Lock is a system of pre-cast concrete blocks made up of two components: a "lock block" and a "key block." Each component is keyed into the other components, giving both stability and integrity.

Tri-Lock blocks are manufactured for ease of installation. Tri-Lock is normally installed in dry conditions by hand placing onto filter fabric. Where site conditions dictate (i.e. underwater applications) Tri-Lock can be supplied on pre-assembled mats utilizing special installation techniques and conventional construction equipment. In either application, the Tri-Lock System is easily installed with minimal manpower and equipment.

The Tri-Lock System, a total membrane of erosion control, varies from any other system in that it is completely self-contained. Tri-Lock offers an additional, significant advantage over other erosion control systems through its unique shape. Its structure and shape give it the ability to negotiate changes of direction without the necessity of added labor or additional product applications.

Erosion Control Products Fact Sheet
Conwed 2500® Bonded Fiber Matrix

Caltrans
New Technology Report

Description:

Bonded fiber matrix (BFM).
Bonded Fiber Matrix that is hydraulically applied for soil stabilization.

Conwed 2500® Bonded Fiber Matrix

Erosion Control Function:

Three-dimensional hydraulically applied mulch. Acts as a mulch protecting soils from rainfall impact. Also provides medium for seed germination.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Typical Application Rates:
< 3:1 Slope 3000 lb / acre
2:1 Slope 3500 lb / acre
> 1:1 Slope 4000 lb / acre
Mix Rate: 60 lbs per 150 gallons water
When possible, rain down on surface to improve soil coverage and reduce material cost. Apply from opposing directions to reduce shadowing. Must cure or dry comp letely to be effective.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application per product is critical.

Specifications (Product Data):

Contains a cross linked, hydrocolloid tackifier, super-absorbent copolymer gel and polyacrylamide that flocculates and anchors the fiber mulch matrix to the soil surface.

Construction Complexity: High

Ancillary Facilities:

Location may require additional equipment/staging areas for bonded fiber matrix compatible hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not all hydromulch machinery is capable of shooting the thicker BFM mixture.

Advantages:

Thicker cover than ordinary hydromulch. Better for high intensity storms and steeper ground.

Contact Information:
Distributor:

Conwed Fibers, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Premium Spray-Applied Erosion Control System for 2:1 to 1:1 slopes, Bonded fiber matrix.

Erosion Control Products Fact Sheet
Conwed 3000® Bonded Fiber Matrix

Caltrans
New Technology Report

Description:

Bonded fiber matrix (BFM).
Bonded Fiber Matrix that is hydraulically applied for soil stabilization.

Conwed 3000® Bonded Fiber Matrix

Erosion Control Function:

Three-dimensional hydraulically applied mulch. Acts as a mulch protecting soils from rainfall impact. Also provides medium for seed germination.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Mix Rate:
60 lbs per 150 gallons water
Typical Application Rates:
< 3:1 Slope 3000 lb / acre
2:1 Slope 3500 lb / acre
> 1:1 Slope 4000 lb / acre
When possible, rain down on surface to improve soil coverage and reduce material cost. Apply from opposing directions to reduce shadowing.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application per product is critical.

Specifications (Product Data):

Physical Properties:

Moisture Content: 12% ±3
Wood Fiber: 85% MAX
Locking Fibers: 5.0% ±1
Crosslinked Tackifier: 10% ±1
Water Holding Capacity: 1500% MIN
Organic Material: 95% MIN
pH: 4.8% ±2
Color Green

Construction Complexity: High

Ancillary Facilities:

Location may require additional equipment/staging areas for bonded fiber matrix compatible hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not all hydromulch machinery is capable of shooting the thicker BFM mixture.

Advantages:

Thicker cover than ordinary hydromulch. Better for high intensity storms and steeper ground.

Contact Information:
Distributor:

Conwed Fibers, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Premium Spray-Applied Erosion Control System for 2:1 to 1:1 slopes, Bonded fiber matrix.

Erosion Control Products Fact Sheet
Eco-Aegis Bonded Fiber Matrix

Caltrans
New Technology Report

Description:

Bonded Fiber Matrix (BFM).
Soil stabilization that sprays on like a mulch but dries to form a porous, breathable, and water insoluble mat.

Eco-Aegis Bonded Fiber Matrix

Erosion Control Function:

Three-dimensional hydraulically applied mulch.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

EcoAegis shall typically be applied at the rate of 3,500 - 4,100 lbs./acre (3,850 - 4,510 kg/Ha) (refer to manufacturers recommendations). The resulting coverage must be at least 1/8 inch thick (3mm) over the entire surface area (maximum occasional voids of 1mm allowed). BFM should be applied from alternate directions to alleviate "shadowing" and be applied when no rainfall is expected for 12 hours.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

For use where the slope is 2H: 1V or greater, or on any slope where wind, rainfall, or soil erosion is expected to be extreme, or where vegetation establishment is not expected.

Specifications (Product Data):

Package Weight: 50 lb./22.7 kg Bags
Moisture Content: 12 +/- 3% by weight
Minimum Water Holding Capacity: approx.10 times dry weight
Composition/Color: Refined Softwood Fiber (90% by weight)
Blended hydrocolloid - based binder (9% by weight)
Mineral Activator (1% by weight)
Color: Natural - No Dye Products
Bonded Fiber Matrix meets the requirements of the US Department of Transportation Standard Specification FP-96, Section 713.05(h)

Construction Complexity: High

Ancillary Facilities:

Where BFM is required by the plans on 1.5H: 1V or steeper slopes or cut or fill slopes 20 feet or more in height, the slopes shall be stabilized as the faces are exposed, as practical. Location may require additional equipment or staging areas for BFM compatible hydromulch applicator.

Location	Soil Category	Steepness
Rural	Rocky	> 1:1
Urban	Not rocky	

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not all hydroseeder equipment can mix and shoot the BFM due to the extra thickness of some formulations.

Advantages:

Thicker cover than ordinary hydromulch. Better for high intensity storms and steeper ground.

Contact Information:
Distributor:

Hydrograss Technologies

Website

http://www.hydrograsstech.com/

Manufacturer:

Canadian Forest Products, Ltd., Fiber Marketing
2806 N.E. Sunset Blvd., Suite A
Renton, WA 98056-3180
800 426-6002

Email

Website

http://www.canforpfd.com/erosion.php?product=ecoaegis

Manufacturer's/Distributor's Comments:

Eco-Aegis Bonded Fiber Matrix sprays on like a mulch but dries to form a porous, breathable, and water insoluble mat that bonds firmly with the soil, prevents erosion, and saves time and money. It is easy to mix and easy to apply with no cavitation. No tenting or rilling; no staples or stakes. It does not hurt wildlife or fish.

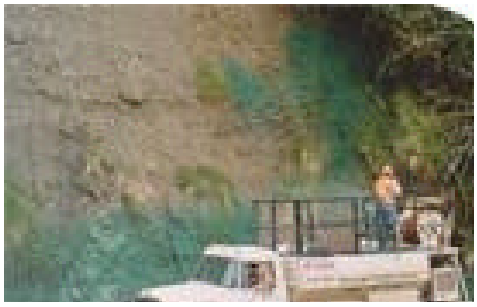
EcoAegis combines the low cost and ease of application of hydroseeding, the protection of a blanket, and the advantages of a mulch. It consists of premium Northern Softwood fibers, a natural guar gum tackifier, and a proprietary crosslinking agent. Our mat protects seeds and enhances germination, then decomposes over time into carbon dioxide and organic matter to further aid in plant development.

Erosion Control Products Fact Sheet
Eco-Aegis ll Bonded Fiber Matrix

Caltrans
New Technology Report

Description:

Bonded fiber matrix (BFM).
Bonded fiber matrix that sprays on like a mulch but dries to form a porous, breathable, and water insoluble mat



Eco-Aegis ll Bonded Fiber Matrix

Erosion Control Function:

Three-dimensional hydraulically applied mulch.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

EcoAegis II shall typically be applied at the rate of 2,700 - 3,500 lbs./acre (2,970 - 3,850 kg/Ha) (refer to manufacturers recommendations). The resulting coverage must be at least 1/8 inch thick (3mm) over the entire surface area (maximum occasional voids of 1mm allowed). BFM should be applied from alternate directions to alleviate "shadowing" and be applied when no rainfall is expected for 12 hours.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application per product is critical.
Use where where slopes do not exceed 2:1 and germination conditions are good.

Specifications (Product Data):

Package Weight: 50 lb./22.7 kg Bags
Moisture Content: 12 +/- 3% by weight
Minimum Water Holding Capacity: approx. 10 times dry weight
Composition: Refined Softwood Fiber (90% by weight)
Blended hydrocolloid - based binder (9.5% by weight)
Mineral Activator (0.5% by weight)
Color: Green
Bonded Fiber Matrix meets the requirements of the US Department of Transportation Standard Specification FP-96, Section 713.05(h)

Construction Complexity: High

Ancillary Facilities:

Location may require additional equipment/staging areas for bonded fiber matrix compatible hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not all hydroseeder equipment can mix and shoot the BFM due to the extra thickness of some formulations.

Advantages:

Thicker cover than ordinary hydromulch. Less bonding agent and less material required for use on slopes 1v:2h or less therefore less expensive than Eco Aegis (I).

Contact Information:
Distributor:

Hydrograss Technologies

Website

http://www.hydrograsstech.com/

Manufacturer:

Canadian Forest Products, Ltd., Fiber Marketing
2806 N.E. Sunset Blvd., Suite A
Renton, WA 98056-3180
800 426-6002

Email

Website

http://www.canforpfd.com/erosion.php?product=ecoaegis2

Manufacturer's/Distributor's Comments:

Bonding firmly with the soil and preventing erosion, the Eco-Aegis step-two Bonded Fiber Matrix sprays on like a mulch but dries to form a porous, breathable, an water insoluble mat. When the slope is 2H: 1V or less and expectations for germination are good, EcoAegis II is specially formulated to reduce costs. If your site has good soil and is being treated when conditions for growth are good, you need less of the "blanket-like" protection from a BFM and for a shorter duration of time. Since EcoAegis II has less bonding agent in the mix, the savings get passed on to you.

Erosion Control Products Fact Sheet
Hydro-Blanket

Caltrans
New Technology Report

Description:

Bonded fiber matrix (BFM).
Spray-on mulch.

Hydro-Blanket

Erosion Control Function:

Three-dimensional hydraulically applied mulch.
Acts as a mulch protecting soils from rainfall impact. Also provides medium for seed germination.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Multiple applications required with specialized hydromulch machinery. Divert any concentrated flows away from site.
Application rates
< 3:1 Slope 3000 lbs / acre
2:1 Slope 3500 lbs / acre
> 1:1 Slope 4000 lbs / acre

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application per product is critical.
BFMs typically can adhere to steep slopes. Application rates are typically around 4,000 kg/ha (3,500 to 4,000 pounds per acre).

Specifications (Product Data):

Physical Properties:
Moisture Content: 12% ±3
Wood Fiber: 85% MAX
Locking Fibers: 5.0% ±1
Crosslinked Tackifier: 10% ±1
Water Holding Capacity: 1500% MIN
Organic Material: 95% MIN
pH: 4.8% ±2
Color: Green

Construction Complexity: High

Ancillary Facilities:

Location may require additional equipment/staging areas for bonded fiber matrix-compatible hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not all hydromulch machinery is capable of shooting the thicker BFM mixture.

Advantages:

Thicker cover than ordinary hydromulch. Better for high intensity storms and steeper ground.

Contact Information:
Distributor:

Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/hydraulicmulches/hydro-blanket.html

Manufacturer:

Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
800 207-6457

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

A patented, mechanically bonded fiber matrix for erosion control on steep slopes. Hydro Blanket contains 90% Wood Fiber, 5% Tacking Agent III and 5% Locking Fibers for proven erosion control performance. Hydro-Blanket requires no cure time and the integrity of the fiber mulch matrix is warranted for 6 months.

Erosion Control Products Fact Sheet
Soil Guard (BFM)

Caltrans
New Technology Report

Description:

Bonded fiber matrix (BFM).
Bonded fiber matrix hydraulically applied for soil stabilization made with wood fibers.

Soil Guard (BFM)

Erosion Control Function:

Three-dimensional hydraulically applied mulch.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

The BFM shall be mixed according to manufacturer's recommendations and contractor shall demonstrate 'free liquid" test to inspector upon request. Bonded Fiber Matrix shall be spray-applied at a rate of 3,000-4,000 LB/acre, utilizing standard hydraulically seeding equipment in successive layers as to achieve 100% coverage of all exposed soil. The BFM shall not be applied immediately before, during or after rainfall, such that the matrix will have opportunity to dry for up to 24 hours after installation.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application per product is critical.

Specifications (Product Data):

Comprised of long-strand, thermally produced wood fibers passing a freeness test at a 760 cc (MLS) level or below (>88% of total volume by weight) held together by organic tackifiers (10%) and mineral bonding agents (<2%) which, upon drying, become insoluble and non-dispersible.

Construction Complexity: High

Ancillary Facilities:

Location may require additional equipment/staging areas for bonded fiber matrix compatible hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not all hydroseeder equipment can mix and shoot the BFM due to the extra thickness of some formulations.

Advantages:

Thicker cover than ordinary hydromulch. Better for high intensity storms and steeper ground.

Contact Information:
Distributor:

Website

Manufacturer:

Mat, Inc.
12402 Highway 2
Floodwood, MN 55736
888 477-3028

Email

info@soilguard.com

Website

http://www.soilguard.com/soilguard.htm

Manufacturer's/Distributor's Comments:

Soil Guard is a one-step erosion control system that revolutionized the practice of soil conservation. It's the result of Weyerhaeuser's R & D who developed this environmentally beneficial product. It is also highly cost-effective and has been a market leader since 1993.

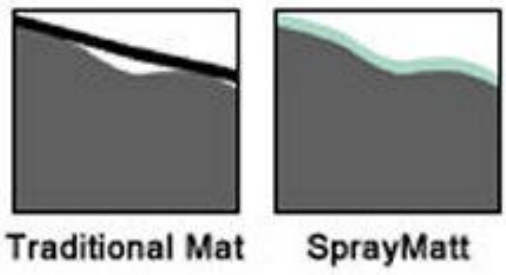
Unique among erosion control systems, Soil Guard delivers the performance of a blanket combined with dramatic cost savings of time and labor. The result is a cost-benefit ratio that makes it the best choice for a very wide range of erosion control needs. Hydraulically applied, Soil Guard conforms to the ground and dries to form a bonded fiber matrix. Once dry, the matrix can be rewet repeatedly and will hold soil vegetation takes hold, Soil Guard slowly decomposes to enrich the soil.

Erosion Control Products Fact Sheet
SprayMatt Bonded Matrix Erosion Fiber

Caltrans
New Technology Report

Description:

Bonded fiber matrix (BFM).
Bonded fiber matrix made with recycled paper



SprayMatt Bonded Matrix Erosion Fiber

Erosion Control Function:

Three-dimensional hydraulically applied mulch.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Drying time will depend on site and climate conditions. Temperature, humidity, and wind condition all influence the actual drying time. When SprayMatt comes in contact with the soil, the moisture and bonding agents contained in the slurry are absorbed, bonding it to the contour of the surface.
SprayMatt is mixed and applied with a standard hydroseeding machine. Although SprayMatt requires no specialized equipment, a hydroseeding machine with a mechanical paddle type agitator is recommended.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application per product is critical.

Specifications (Product Data):

SprayMatt Bonded Fiber Matrix is a unique blend of premium regenerated paper fiber and bonding elements. SprayMatt is non-toxic and biodegradable.

Construction Complexity: High

Ancillary Facilities:

Location may require additional equipment/staging areas for bonded fiber matrix compatible hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Reapply or repair areas where BFM cover is dislodged

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Thicker cover than ordinary hydromulch. Better for high intensity storms and steeper ground. Made from recycled paper.

Contact Information:

Distributor:

Website

Manufacturer:

Central Fiber Corporation
4814 Fiber Lane
Wellsville, Kansas
800 654-6117

Email

mailto:sales@centralfiber.com

Website

http://www.centralfiber.com/

Manufacturer's/Distributor's Comments:

Central Fiber Corporation is proud to introduce SprayMatt bonded Matrix Erosion Fiber. SprayMatt is a unique blend of our premium recycled paper fiber hydroseeding mulch and bonding elements. This combination gives SprayMatt the easy pumpability of paper fiber mulch and the spreadability of natural fiber mulch. SprayMatt's one-bag packaging of fiber and a bonding element ensures ease of application. This easy one-step application also reduces labor costs. SprayMatt will anchor itself to the soil surface with little site preparation, even on the steepest slopes. SprayMatt cures to a flexible crust for a "mat-type" stability on erodable slopes even after numerous rewettings. SprayMatt offers an environment in which grass seed germinates quickly, even in arid climates. Seed and fertilizer can be added to mat-type effect creates a blanket to protect and feed the seed during germination. SprayMatt is made from recycled paper and is non-toxic and completely biodegradable.

Erosion Control Products Fact Sheet
Bio-12 Straw Wattles

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Straw fiber rolls with bio and photodegradable netting.

Bio-12 Straw Wattles

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Straw Wattles shall be installed as shown on the plans. They shall be placed on contour and staked with 18- or 24-inch wood stakes at four feet on center. The ends of adjacent Straw Wattles shall be abutted to each other snugly.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The Bio-12 Straw Wattles™ are manufactured from rice straw or other specified straw, and are wrapped in a 100% biodegradable tubular 7 oz. plain burlap. The burlap is Medium Weight Natural Burlap with a 9 X 8 Warp & Fill, and weigh 7 oz. per square yard. The Bio-12 Straw Wattles™ are twelve inches in diameter (+/- one inch), and have a density weigh of approximately 3.8 pounds per foot (+/- 10%). Maximum length is 12 feet (+/- 0.5 feet).

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

California Straw Works
5531 State Ave
Sacramento, CA 95819-1827
916 453.1456

Website

http://www.strawwattles.com/

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Manufactured with rice straw or other specified straw,encapsulated in bio and photo-degradable netting reduce slope length, slowing and spreading water flow. They diminish storm water pollution by capturing sediment. They are used to construct temporary diversion berms.

Erosion Control Products Fact Sheet
Bio-9 Straw Wattles

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Straw fiber rolls with bio and photodegradable netting.

Bio-9 Straw Wattles

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Straw Wattles shall be installed as shown on the plans. They shall be placed on contour and staked with 18- or 24-inch wood stakes at four feet on center. The ends of adjacent Straw Wattles shall be abutted to each other snugly.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The Bio-9 Straw Wattles™ are manufactured from rice straw or other specified straw, and are wrapped in a 100% biodegradable tubular 7 oz. plain burlap. The burlap is Medium Weight Natural Burlap with a 9 X 8 Warp & Fill, and weigh 7 oz. per square yard. The Bio-9 Straw Wattles™ are nine inches in diameter (+/- one inch), and have a density weigh of approximately 1.6 pounds per foot (+/- 10%). Maximum length is 25 feet (+/- 0.5 feet).

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

California Straw Works
5531 State Ave
Sacramento, CA 95819-1827
916 453.1456

Website

http://www.strawwattles.com/

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Manufactured with rice straw or other specified straw, encapsulated in bio and photo-degradable netting reduce slope length, slowing and spreading water flow. They diminish storm water pollution by capturing sediment. They are used to construct temporary diversion berms.

Erosion Control Products Fact Sheet
BioD-Roll (coir roll)

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir log fiber rolls.

BioD-Roll (coir roll)

Erosion Control Function:

Provides flexible, porous, plantable stream bank armoring.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions for proper installation. Typically require a toe trench. Stake and lash with durable materials suitable for site conditions.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

RoLanka's BioD-Roll coir rolls are available in 12" (30 cm), 16" (40 cm), 18" (45 cm) and 20" (50 cm) diameters. The 2"x2" (5cm x 5cm) outer net is available in 80 lbs (356N) strength coir twine or 200 lbs(890 N) strength synthetic twine. Since coir rolls are used for strong support at stream toe, these rolls are available only in higher density [9lbs/cu.ft. (144 kg/cu.m)].

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:
Inspect and replace as needed.

Maintenance Staffing/Equipment:
Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:
Medium

Constraints:
Proper installation is critical. Heavier than straw wattles.

Advantages:
Long lasting, flexible and porous. Conforms to stream bank. Good planting medium.

Contact Information:
Distributor:

Website

Manufacturer:
Rolanka
800 760-3215

Email

Website
http://www.rolanka.com/

Manufacturer's/Distributor's Comments:
BioD-Roll coir rolls provide initial structural stability by resisting wave action and flow velocity. The fiber core in BioD-Roll is an excellent medium for plant growth. During the installation process, young plants are inserted into the BioD-Roll. Sediment is deposited in and around the BioD-Roll which creates an excellent environment for further development of vegetation. Upon biodegradation of the coir roll, there will be a well developed root structure in the original ground which sucessfully holds soil in place.

Erosion Control Products Fact Sheet
BioD-Watl

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir fiber rolls.

BioD-Watl

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

On disturbed slopes, 12" or 9" diameter coir wattles should generally be placed 8'-12' apart. The length of the wattle depends on the width of the channel. The flexible coir wattles can be easily cut and joined to the required size using 6mm coir twine. Place coir wattles in 2-4" deep trenches and secure with 2"x2"x24" wooden wedges. Place wooden wedges 3' apart on low flow condition (less than 8 fps) and 2' apart on high flows (8-10 fps). The front of the wattle can be further secured with 6" metal staples so that water will not flow under the coir wattles.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

RoLanka's BioD-WatlTM is made from coir fiber uniformly packed into a high strength coir twine netting (2" x 2" opening). Available in 5", 9" and 12" diameters and 10', 15' and 20' lengths.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Heavier than straw wattles.

Advantages:

Lasts 3 to 5 times as long as straw wattles. Makes a good planting medium. No plastics.

Contact Information:
Distributor:

Website

Manufacturer:

RoLanka
800 760-3215

Email

Website

http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

RoLanka's BioD-WatlTM is made from coir fiber uniformly packed into a high strength coir twine netting (2" x 2"opening). Flexible, easy-to-use, 100% biodegradable and cost effective BioD-WatlTM is an excellent sedimentation control structure in construction projects and landscaping activities. They also are effective and esthetically pleasing check dams for channels and steep slopes, especially compared to straw bales. BioD-WatlTM is available in 5",9" and 12" diameters and 10', 15' and 20' lengths. Durable coir wattles have numerous advantages over straw wattles and wood fiber logs with plastic nets. They can be successfully used for streambank restorations in low velocity streams.

Erosion Control Products Fact Sheet
Coco Gabion

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir fiber stuffed and encased in a biodegradable netting, formed in a square shape structure. Coco gabion can be made with or without a steel frame.

Coco Gabion

Erosion Control Function:

Used to stabilize toe of slope by providing a structural planting medium.

Caltrans BMP ID
SC-5, PSP

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Follow engineer's specifications. Typically, excavate a trench to receive the Coco Gabion. Engineer to specify trench depth. Secure with stakes and backfill. Coco Gabions should be used with planting to accomplish long-term bank/slope protection.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Specifications:
length x width x height: 100x100x50cm
weight: of 20 kgs
Gabion size can vary according to the buyer's specification.
Also available: coco gabion filled with coir fiber/chopped coir fibres and encased in a rectangular basket shape with galvanized wired steel mesh.

Construction Complexity: Low

Ancillary Facilities:

Backhoe or excavator may be required to create trench to insert gabion and fill after placement. Longer lengths may require lifting equipment. Requires installation of locally-adapted plant species (such as willows or tules) for long-term stabilization.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed. Plantings may require watering and weeding during initial establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Constraints:

Much lighter weight than traditional wire basket and rock gabions may make structure susceptible to washout before plants are established. Requires use of appropriate plant species for long-term stabilization.

Advantages:

Lightweight, easy to install. Allows for dense planting of locally adapted species to perform long-term erosion control.

Contact Information:
Distributor:

Website

Manufacturer:

ExcelFiber (a division of ExcelHigh, Inc.)
350 5th Ave Suite 700a
New York, NY 10001
212 947-8543

Email

Website

http://www.excelhigh.com

Manufacturer's/Distributor's Comments:

This is an ideal product to be used in at a base of a slope where a low toe wall is needed to stabilize the slope and reduce slope steepness in a stream bank. Appropriate for use with soil bioengineering systems and vegetative plantings to stabilize the upper bank and secure a regenerative source of stream bank vegetation.

The main advantage of coco gabion is that it can be planted with live cuttings on any of its surface area.

Fibre substrate filled inside the coco gabion is an ideal medium for root development for the cuttings and, subsequently, these plants will consolidate the structure and bind it to the slope.

Erosion Control Products Fact Sheet
Earth Saver Rice Straw Wattles

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber rolls made from rice straw.

Earth Saver Rice Straw Wattles

Erosion Control Function:

Used as a slope break to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Stake Earth Saver Rice Straw Wattles to contour of slope in a 2" to 5" trench. For sandy soils, dig a 3" to 5" trench. For dense soils, dig a 2" to 3" trench. Place Earth Saver Rice Straw Wattle firmly in the trench. Stakes are to be placed at each end of the Earth Saver and every 4', leaving 2" of the stake above the Earth Saver. Pack soil against the wattles on the uphill side. For continuous rows, Earth Saver should be firmly butted, not overlapped. Earth Saver rows should be placed horizontally, approximately 10' to 25' apart on slope, depending on site and soil conditions. See more in Manufacturer's comments.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Earth Saver Rice Straw Wattles are made from recycled, naturally weed-free California rice straw. Earth Saver Wattles are available in three types of netting: biodegradable, photodegradable and burlap. Earth Saver Wattles are available in three standard sizes: 9" x 25', 12" x 10' and 20" x 8'.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install and remove. A variety of netting is available to suit environmental conditions.

Contact Information:
Distributor:

http://www.earth-savers.com/

Website

http://www.earth-savers.com/

Manufacturer:

Earth Saver
866 928-9537

Email

Website

http://www.earth-savers.com/

Manufacturer's/Distributor's Comments:

Earth Saver Rice Straw Wattles are made from recycled, naturally weed-free California rice straw. Earth Saver Wattles are available in three types of netting: biodegradable, photodegradable, and burlap. Earth Saver Wattles are available in three standard sizes: 9 x 25', 12" x 10' and 20" x 8'.

When Earth Saver is used on flat ground, drive stakes in vertically; when used on slopes, drive the stakes at an angle towards the uphill side of the slope. Closer spacing is needed to catch sediment for sandy soil and high rainfall. Wider spacing is needed for heavy soil, low rainfall and low sediment loads.

Erosion Control Products Fact Sheet
En-coir Fiber Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Heavy duty coconut fiber rolls.

No graphic available

En-coir Fiber Log

Erosion Control Function:

Coconut fiber logs for shoreline and stream channel applications to dissipate the impact of wave action and flowing water, protect erodable soils and encourage vegetation growth through biotechnical stabilization.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Smooth or trench area to receive log. Stake in place with stakes two feet on center. Log must be firm against ground surface so that no water can run underneath. Usually installed on contour. In wet areas, install appropriate plants into log for long lasting benefits.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

En-Coir Fiber Logs are 100% natural coconut fiber logs for shoreline and stream channel applications to dissipate the impact of wave action and flowing water, protect erodable soils and encourage vegetation growth through biotechnical stabilization. En-Coir Fiber Logs are available in 12 inch diam. x 20 feet long. (or 6", 8" or 20 " diameter also available).

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Heavier than straw rolls.

Advantages:

More durable than straw rolls. No plastic. Can be used as a planting medium.

Contact Information:
Distributor:

Website

Manufacturer:

Emerald Seed and Supply
9330 N. E. Halsey
Portland, OR 97220
800 826-8873

Email

info@emeraldseedandsupply.com

Website

http://www.emeraldseedandsupply.com/erosioncontrol/ec blankets.html

Manufacturer's/Distributor's Comments:

En-coir™ Fiber Logs (coconut fiber logs)

En-Coir Fiber Logs are 100% natural coconut fiber logs for shoreline and stream channel applications to dissipate the impact of wave action and flowing water, protect erodable soils and encourage vegetation growth through biotechnical stabilization.

En-Coir Fiber Logs is economical, durable and biodegradable providing excellent structural stability and resistance to forces of water action until the vegetation is naturally established. During the initial installation process, seedlings and /or cuttings are inserted into the fiber core of the En-Coir Fiber Logs through the openings in the outer netting. Sediment deposited in and around the Fiber logs provides an excellent growth medium for plants. As the Fiber Logs biodegrade, the plants develop a well-established root system in the shoreline sediment to retain the soil in place. En-Coir Fiber Logs are available in 12 inch diam. x 20 feet long. (or 6", 8" or 20 " diameter also available).

Advantages Applications
100% natural coir fiber Water Diversion
100% biodegradable Sediment Filtration
Traps sediment Sand Bagging
Environmentally pleasing Silt Pond Construction
Economical Spill Containment
Easy to install
Safe to wildlife

Erosion Control Products Fact Sheet
Excelsior Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber rolls made with excelsior and plastic netting.

Excelsior Log

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers and mini-check dams.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Smooth or trench area to receive log. Stake in place with stakes two feet on center. Log must be firm against ground surface so that no water can run underneath. Usually installed on contour.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Excelsior Logs™ are made of curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The wood fibers are enclosed in a seamless photo-degradeable tube netting.
Standard Dimensions:
Length 10 foot, Diameter 12 inches, Weight 3.0 lbs/lineal foot
Length 10 foot, Diameter 18 inches, Weight 5.0 lbs/lineal foot
Includes 5 stakes.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Website

Manufacturer:

Emerald Seed and Supply
9330 N. E. Halsey
Portland, OR 97220
800 826-8873

Email

info@emeraldseedandsupply.com

Website

http://www.emeraldseedandsupply.com/erosioncontrol/ec_blankets.html

Manufacturer's/Distributor's Comments:

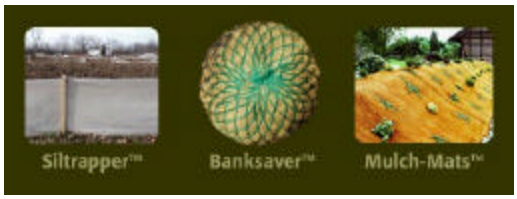
Excelsior Logs™
Better Filtering of Runoff Waters
Stop Check Dam Blowouts
Protect Water from Going Around Check Dams
Prevent Spread of Non-Native Vegetation
Easier to Handle and Install Than Straw Bales
Non-food source for Animals
Excelsior Logs™ are made of curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The wood fibers are enclosed in a seamless photo-degradeable tube netting.
Standard Dimensions:
Length 10 foot, Diameter 12 inches, Weight 3.0 lbs/lineal foot
Length 10 foot, Diameter 18 inches, Weight 5.0 lbs/lineal foot
Includes 5 stakes. One log replaces 3 hay bales. They are weed free/sterile, when you do not want straw seed contamination.

Erosion Control Products Fact Sheet
Fiber Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir fiber rolls of various sizes and shapes, synthetic or natural fiber net exteriors.



Fiber Log

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

For trench packing, Fiber Logs™ are placed in a trench perpendicular to the flow of water to slow or spread water, reducing erosion and entrapping sediment. To reduce wave and flow impact Fiber Logs™ are placed in trenches running parallel to the shoreline. In upland areas, trench packing serves to slow water and spread it over the soil surface, reducing its erosion potential. Trench packing can also be used to control shallow seeps, protect wetland construction and renovate/protect roads and trails.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Round or rectangular shapes. Diameter ranges from 6" to 20". Rectangular sizes include 12" x 10" and 16" x 10".
• Synthetic or natural fiber net exteriors with openings ranging from 1-2".
• Length ranges from 7.5' to 20'.
• Coir fiber density ranges from five to nine lbs. per cubic foot.
• Vegetated or non-vegetated.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure, clean out sediment as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Website

Manufacturer:

King Fibre Coirporation
1398 N. Shadeland Avenue Suite 2224

Indianapolis , IN 46219

Email

Website

http://www.kingfibre.com/products/silt.html

Manufacturer's/Distributor's Comments:

Fiber Logs™ make erosion control and re-vegetation where water meets land easier than ever. Fiber Logs ™ buffer erosive forces, filter runoff or dredged soils, collect and hold mineral and organic particles, provide a physically stable substrate for root growth, stabilize and secure soils, and slowly biodegrade to leave an established plant community.

As wave stilling devices, Fiber Logs™ are typically placed offshore to break wave energies and entrap sediment. This process facilitates the establishment of vegetation capable of dissipating wave energies.

No matter your site conditions, be assured there is a BankSaver™ Fiber Log™ to meet your needs. King Fibre is proud to provide the highest quality, uniformity, and widest variety of Fiber Logs available. Depending on site conditions, longevity/durability requirements, and application, the following Fiber Log™ options are available... • Round or rectangular shapes. Diameter ranges from 6" to 20". Rectangular sizes include 12" x 10" and 16" x 10".
• Synthetic or natural fiber net exteriors with openings ranging from 1-2".
• To ease and reduce labor length ranges from 7.5' to 20'. The 7.5' Fiber Logs™ are palletized to further ease shipping, handling, and unloading.
• Fibre density ranges from five to nine lbs. per cubic foot.
• Vegetated or non-vegetated. King Fibre has the technology to plant rapidly and successfully the densest Fiber Logs™, ensuring durability and performance on the most difficult sites.

Erosion Control Products Fact Sheet
Hy-Tex CoirLog

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Predrilled coirlogs ready for planting designed to protect waterway and lakeshore margins.

No graphic available

Hy-Tex CoirLog

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface water. Also used as sediment catchment barriers. Also designed to protect waterway and lakeshore margins, and promote the restoration of vegetation.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Uses and conditions vary. Generally installed in a shallow trench constructed on contour. Staked 1.5 to 2 foot intervals. In wet areas, plants may be inserted into the fiber roll.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Hy-Tex CoirLog and CoirPallet coconut fiber substrates have been specifically designed to protect waterway and lakeshore margins, and promote the restoration of vegetation.
Both products are custom made in Britain to suit specific site demands and project requirements, and CoirLogs incorporate unique pre-drilled planting holes at regular intervals to ease planting. As standard, the substrates are encased in polypropylene netting for durability, while a specially coated coir netting option is available for environmentally sensitive locations.

Construction Complexity: Low

Ancillary Facilities:

Location	Soil Category	Steepness
Rural Urban	Not rocky	Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Heavier than straw rolls.

Advantages:

More durable than straw rolls. Conforms to topography. Can be used as a planting medium.

Contact Information:
Distributor:

Website

Manufacturer:

Hy-Tex Ltd
PO Box 97
Aldington, ASHFORD, kent, England TN25 7EA
+44 (O) `122 720097

Email

Website

http://www.hy-tex.co.uk/ht_bio_gm.html

Manufacturer's/Distributor's Comments:

Predrilled coirlogs ready for planting

Hy-Tex CoirLog and CoirPallet coconut fibre substrates have been specifically designed to protect waterway and lakeshore margins, and promote the restoration of vegetation. Both products are custom made in Britain to suit specific site demands and project requirements, and CoirLogs incorporate unique pre-drilled planting holes at regular intervals to ease planting. As standard, the substrates are encased in polypropylene netting for durability, while a specially coated coir netting option is available for environmentally sensitive locations.

Erosion Control Products Fact Sheet
KoirLog

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir log used for shoreline and stream channel applications.
Larger, more dense version of a fiber roll.

No graphic available

KoirLog

Erosion Control Function:

Provides flexible, porous, plantable stream bank armoring.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

KoirLogTM is anchored firmly in the subsoil to protect the bottom of the slope and to hold the soil fill behind the toe of the slope. 2" x 2" wooden stakes are used to anchor the KoirLogTM in place. The length and spacing of the stakes vary depending on the actual field conditions. Coir twine can be used to tie the KoirLogTM to the stakes and to each other.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

KoirlogsTM are available in 6", 8", 12", 16", and 20" diameter. The logs are typically 10' or 20' long.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Heavier than straw wattles.

Advantages:

Long lasting, flexible and porous. Conforms to stream bank. Good planting medium. No plastics.

Contact Information:
Distributor:

Website

Manufacturer:

Nedia Enterprises
888 725-6999

Email

Website
http://www.nedia.com/

Manufacturer's/Distributor's Comments:

KoirLogTM - Coconut fiber log

KoirLogsTM are 100% natural coconut fiber logs used for shoreline and stream channel applications to dissipate the impact of wave action and flowing water, protect erodible soils and encourage vegetation growth through biotechnical stabilization.

KoirLogsTM are economical, durable and biodegradable providing excellent structural stability and resistance to forces of water action until the vegetation is naturally established. During the initial installation process, seedlings and/or cuttings are inserted into the fiber core of the KoirLogTM through the openings in the outer netting. Sediment deposited in and around the KoirLogTM provides an excellent growth medium for plants. As the KoirLogTM biodegrades, the plants develop a well established root system in the shoreline sediment to retain the soil in place.

KoirlogsTM are available in 6", 8", 12", 16", and 20" diameter. The logs are typically 10' or 20' long.

Erosion Control Products Fact Sheet
Prairie Logs

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Pre-vegetated coir fiber roll.

No graphic available

Prairie Logs

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface water. Pre-vegetated roll establishes vegetation rapidly on steep slopes.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Prairie Logs™ are placed in shallow trenches equal to half their diameter along the slope or stream contour. After placement they are staked into place. No back filling is required. Applications include slope restoration, road embankments, wide gullies, and the repair of slump areas.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Prairie Logs™ are small diameter Fiber Logs™ that are vegetated with deep rooting native plants.
• Synthetic or natural fiber net exteriors with openings ranging from 1-2".
• Length ranges from 7.5' to 20'.
• Coir fibre density ranges from five to nine lbs. per cubic foot.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed. Plants may require watering during the establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Need to specify plants that are suitable for local conditions.

Advantages:

May improve plant establishment in some situations - especially steep slopes and streambanks.

Contact Information:
Distributor:

Website

Manufacturer:

King Fibre Coirporation
1398 N. Shadeland Avenue Suite 2224
Indianapolis , IN 46219
317 356-8437

Email

Website

http://www.kingfibre.com/products/silt.html

Manufacturer's/Distributor's Comments:

Prairie Logs™ are small diameter Fiber Logs™ that are vegetated with deep rooting native plants. These modules were developed to provide a cost effective, easy to use highly successful means of controlling erosion and re-vegetating slopes.

Many reservoir and natural areas have slopes with steep grades, poor soil conditions, and difficult access. Contour wattling is a soil bioengineering technique utilized to control surface erosion by breaking long slopes into shorter slopes with dormant or dead fascines (bundles of branches).

With this technique in mind, Prairie Logs™ are placed in shallow trenches equal to half their diameter along the slope or stream contour. After placement they are staked into place. No back filling is required. Applications include slope restoration, road embankments, wide gullies, and the repair of slump areas. With Prairie Logs™ the erosion control and re-vegetation of difficult slopes has never been more advanced.

Erosion Control Products Fact Sheet
Restoration Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber roll made of straw, excelsior or native grasses.

Restoration Log

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface water. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Prepare the surface before the installation procedure is started. Shallow gullies should be smoothed as work progresses. Dig small trenches across the slope on contour for the fiber rolls. The trench should be deep enough to contain the bottom half of the roll. When the soil is loose and uncompacted, the soil will tend to settle so the trench should be deep enough to accommodate the bottom 2/3 of the roll. It is critical the fiber rolls are installed perpendicular to the expected water flow, parallel to the slope contour. Secure with stakes on two-foot centers.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Biodegradable Restoration Logs™ are 100% certified weed free. They are made from rice straw or excelsior material. Restoration Logs™ are most often used in rolls approximately 25 feet long, 9" in diameter and approximately 2.5 pounds per linear foot. 18" dia. Restoration Logs™ available upon request. The weight will, of course, vary depending on their size and materials used.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install. Rolls made with native grasses may improve native grass establishment.

Contact Information:
Distributor:

Website

Manufacturer:

Email

Website

http://restoration-services.com/Products.htm

Manufacturer's/Distributor's Comments:

Our custom Restoration Logs™ are 100% certified weed free. They are often a blendof 75% weed free wheat straw and 25% weed free native grasses. We can produce a blend of native grasses to accommodate your site needs. For example, a common ative grass blend for the South Western States consists of Western Wheat Grass, Sideoats Grama, Arizona Fescue, Purple Three-Awn, Blue Grama and Galleta Grass. Of course, we can adjust percentages or change grasses as required, including the production of 100% native grass wattles.

Erosion Control Products Fact Sheet
Sediment Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber rolls made of excelsior.

Sediment Log

Erosion Control Function:

Used as a slope break to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Sediment Logs® are typically installed lying flat on the ground and not buried. Project specifications should be reviewed for any special installation requirements. They shall be secured to the subgrade by a 1" diameter wood stake every two lineal feet across its length. The stakes shall be intertwined with the outer mesh only (on the downstream side only) and placed in the ground a minimum of 610 mm deep (24").

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Fiber: 100% Weed Free Great Lakes Aspen Curlex Excelsior interlocking fibers with barbed edges.
Fiber Size: 80% of fibers a minimum of 6" (15.24 cm) long
Width: 0.031" ± 0.008" (0.79 mm ± 0.203 mm)
Thickness: 0.021" ± 0.003" (0.53 mm ± 0.076 mm)
Density: 2.54 lbs/cu ft (40.80 kg/m 3) for 12 inch (30.48 cm) diameter ± 10%; 1.38 lbs/cu ft (22.00 kg/m 3) for 20 inch (50.80 cm) diameter ± 10%
Weight: 9.07kg (20lb) for 12 inch, 13.61kg (30lb) for 20 inch
Net Opening Size: Polyester 840 Denier 1in x 1in (2.54 cm x 2.54 cm) hexagon opening.
Netting Configuration: Totally encased

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Plastic netting may entrap animals.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Website

Manufacturer:

American Excelsior Company
Arlington, TX
800 777-7645

Email

Website

http://www.curlex.com

Manufacturer's/Distributor's Comments:

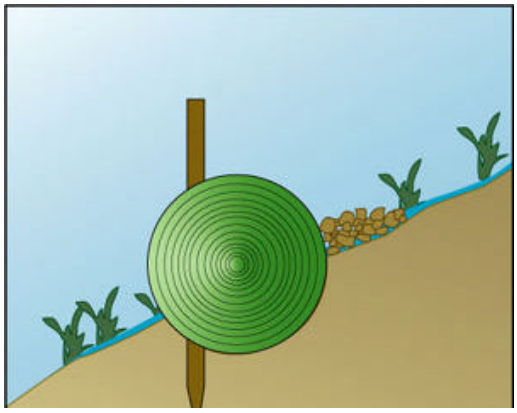
Material Characteristics
Sediment Logs are versatile excelsior logs comprised of durable netting and our unique Curlex fiber. These two materials are combined to form netted tubes of excelsior that can slow storm water, capture sediment, dissipate hydraulic energy and protect against stream bank and shoreline erosion. They also come with three other benefits: no trenching, no weed seeds and no disposal hassles. Simple installation allows one to comfortably handle and install 6m (20lb) of Sediment Log in only 10 minutes.
Diameters -
Type I - 50cm (20in) energy dissipation in heavy duty concentrated flow areas
Type II - 30cm (12in) energy dissipation in mild to medium concentrated flow areas
Length -
3m (10ft) Standard (ends may be attached with plastic ties for additional length)

Erosion Control Products Fact Sheet
Slope-Gard 1 Fiber Roll

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber rolls made with excelsior inside, plastic netting on the outside.



Slope-Gard 1 Fiber Roll

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Prepare the surface before the installation procedure is started. Shallow gullies should be smoothed as work progresses. Dig small trenches across the slope on contour for the fiber rolls. The trench should be deep enough to contain the bottom half of the roll. When the soil is loose and uncompacted, the soil will tend to settle so the trench should be deep enough to accommodate the bottom 2/3 of the roll. It is critical the fiber rolls are installed perpendicular to the expected water flow, parallel to the slope contour. Secure with stakes on two-foot centers.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

SlopeGard 1 Fiber Rolls are assembled from a machined mat or blanket of shaved aspen wood curled excelsior. The blanket shall have a consistent thickness, 80% of the fibers will be at least six inches in length, and the fibers will be evenly distributed over the entire area of the blanket. To retain its integrity, the blanket shall be covered with a photodegradable, extruded, clear plastic mesh. None of the materials shall contain any chemical additives. The blanket shall be rolled to form a tube of approximately 8 inches (200 mm) in diameter and in 10 foot (3 meters) or 20 foot (6 meters) in length.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Plastic may entrap animals.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Website

Manufacturer:

KriStar Enterprises, Inc.
P.O. Box 7352
Santa Rosa, CA 95407-0352
800 579-8819

Email

customercare@kristar.com

Website

http://www.kristar.com/

Manufacturer's/Distributor's Comments:

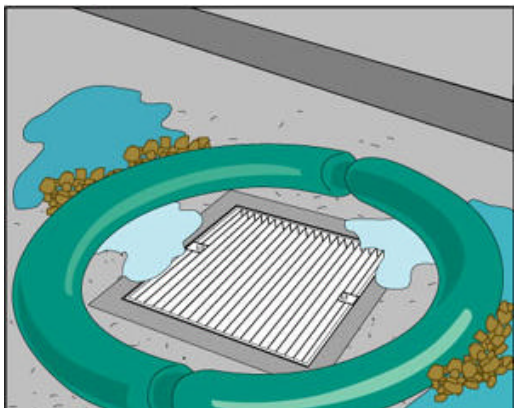
Slope-Gard™ 1 fiber rolls are made from curled wood (aspen) excelsior formed into 8" diameter tubes in lengths of 10 and 20 feet. Custom diameters and lengths are available. They are available in quantities from one unit to bundles totaling 300 feet.
SlopeGard 1 should in installed in accordance with standard details for fiber rolls (straw tubes/wattles).

Erosion Control Products Fact Sheet
Slope-Gard 3 Fiber Roll Inlet Protector

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber roll inlet protection device designed to control sediment and debris.



Slope-Gard 3 Fiber Roll Inlet Protector

Erosion Control Function:

Storm drain inlet protection. Slows and filters run off before it enters the storm drain.

Caltrans BMP ID
SC-10

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Slope-Gard™ 3 is placed end-to-end in a circle around a construction site drainage inlet to prevent runoff and silt, sediment and debris from entering the inlet.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria .

Specifications (Product Data):

It is available in an 8 inch diameter and lengths of 6 feet and 10 feet. Slope-Gard™ 3 is available in either curled wood excelsior or reticulated polyurethane. It has a weighted inner core that holds the device in place. The reticulated polyurethane is also available in safety orange to increase detection and to reduce the chances of tripping and damage from vehicles.

Construction Complexity: Low

Ancillary Facilities:

Drain inlet protection is not effective by itself. Reduce upstream sediment runoff with mulches and vegetation.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Frequent inspection, clean out and adjustment may be required.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. May be easily overwhelmed and bypassed. May shunt water away from storm drain and on to another unprotected location. Must be frequently checked and cleaned during the rainy season.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Website

Manufacturer:

KriStar Enterprises, Inc.
P.O. Box 7352
Santa Rosa, CA 95407-0352
800 579-8819

Email

customercare@kristar.com

Website

http://www.kristar.com/

Manufacturer's/Distributor's Comments:

An alternative to hay bales to protect drainage inlets during course of construction, Slope-Gard™ 3 is a fiber roll inlet protection device designed to control sediment and debris. It is available in an 8 inch diameter and lengths of 6 feet and 10 feet.

Slope-Gard™ 3 is available in either curled wood excelsior or reticulated polyurethane . It has a weighted inner core that holds the device in place thereby eliminating the need for securing in place with either sandbags or stakes. The reticulated polyurethane is also available in safety orange to increase detection and to reduce the chances of tripping and damage from vehicles.

Erosion Control Products Fact Sheet
Straw Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Fiber rolls made with straw and plastic netting.

Straw Log

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Straw Logs shall be installed per the specifier's recommendation(s) and/or as shown on the plans.They shall be installed into the recommended trenches and securely anchored to the ground with wood stakes with a net size of 1.5" x 30" long. Each 8-foot Straw Log requires 4 stakes. (One stake every 2 feet.) The Straw Logs shall be installed so that the ends are tightly abutted, not overlapped.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The Straw Log shall be made from new crop agricultural straw and certified to be free of noxious weed seed and other non-straw plant residue, and wrapped in a seamless tubular black plastic netting. The Straw Log shall be of consistent size and density throughout. The Straw Log shall be 12 inches in diameter & the weight shall be 2.5 lbs. per lineal foot. Standard length shall be 8 feet long, and will weigh 20 pounds when manufactured. Other lengths are available upon request. All values are plus or minus 10%. The plastic netting shall be treated with U.V. stabilizer, but shall be photodegradable.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Plastic netting may entrap animals.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Website

Manufacturer:

Emerald Seed and Supply
9330 N. E. Halsey
Portland, OR 97220
800 826-8873

Email

info@emeraldseedandsupply.com

Website

http://www.emeraldseedandsupply.com/erosioncontrol/ec blankets.html

Manufacturer's/Distributor's Comments:

Straw Logs
For Erosion Control Applications. Straw logs, 12 in. diam. x 8 ft. (stakes sold separate) One log replaces 2 hay bales.

Specifications
The Straw Log shall be made from new crop agricultural straw and certified to be free of noxious weed seed and other non-straw plant residue, and wrapped in a seamless tubular black plastic netting. The Straw Log shall be of consistent size and density throughout. The Straw Log shall be 12 inches in diameter & the weight shall be 2.5 lbs. per lineal foot. Standard Length shall be 8 feet long, and will weigh 20 pounds when manufactured. Other lengths are available upon request. All values are plus or minus 10%. The plastic netting shall be treated with U.V. stabilizer, but shall be photodegradable.

Installation Instructions
The Straw Log shall be installed per the specifier's recommendation(s) and/or as shown on the plans. They shall be installed into the recommended trenches and securely anchored to the ground with wood stakes with a net size of 1.5" x 30" long. Each 8 foot Straw Log requires 4 stakes. (One stake every 2 feet.). The Straw Logs shall be installed so that the ends are tightly abutted, not overlapped.

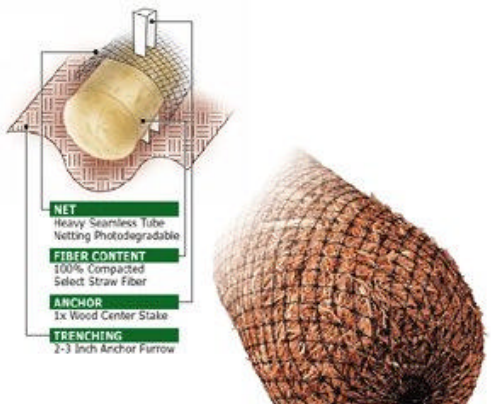
Typical Straw Log Uses
The Straw Logs were designed to be used where ever straw/hay bales have been used as a sediment filter barrier in roadside ditches, medians, and swales; and around drop water inlets.

Erosion Control Products Fact Sheet
Straw Wattle Slope Interruption Device

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
9" diameter straw fiber roll w/ photodegradable netting.
Functional longevity 24 months.



Straw Wattle Slope Interruption Device

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface water.
Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions and install as shown on drawings. It may be necessary to smooth the ground prior to installation in order to assure better soil to wattle contact.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

BMP Device Type (SID): 9" Wattle
Sediment Retention Capacity (lbs/lft.): 30
De-Stabilizing Moisture Retention (%): 11
Functional Capacity Duration (Minutes): 350
Physical Property
Unit Weight (lbs/lineal ft.): 1.6
Functional Longevity (Months): 24
Installed Free Board Height (Inches): 7
University Laboratory Tested: Yes
Additional On Site Rolling Required: No
Manufactured Ready To Use (RTU): Yes

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Inspect and replace or re-secure, clean out sediment as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Plastic netting may entrap animals.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

Telfer Geosynthetics
1150 Willow Pass Rd
Pittsburg, CA
800 956-9999

Website

Manufacturer:

Greenfix America
PO Box 1620
Calipatria, CA
760 348-7600

Email

sales@greenfix.com

Website

http://www.greenfix.com

Manufacturer's/Distributor's Comments:

Erosion Control Products Fact Sheet
UV-12 Straw Wattles

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Straw fiber rolls with bio and photodegradable netting.

UV-12 Straw Wattles

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Straw Wattles shall be installed as shown on the plans. They shall be placed on contour and staked with 18- or 24-inch wood stakes at four feet on center. The ends of adjacent Straw Wattles shall be abutted to each other snugly.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The UV-12 Straw Wattles™ are manufactured from rice straw or other specified straw, and are wrapped in a tubular plastic netting. The netting has a strand thickness of 0.03 inch, and a knot thickness of 0.055 and a weight of 0.35 ounce per foot (each +/- 10%) and is made from 85% high density polyethylene, 14% ethyl vinyl acetate and 1% color for UV inhibition. The UV-12 Straw Wattles™ are 12 inches in diameter (+/- one inch), and have a density weight of approximately 4 pounds per foot (+/- 10%). Maximum length is 12 feet long (+/- 0.5 feet).

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

California Straw Works
5531 State Ave
Sacramento, CA 95819-1827
916 453.1456

Website

http://www.strawwattles.com/

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Manufactured with rice straw or other specified straw,encapsulated in bio and photo-degradable netting reduce slope length, slowing and spreading water flow. They diminish storm water pollution by capturing sediment. They are used to construct temporary diversion berms.

Erosion Control Products Fact Sheet
UV-9 Straw Wattles

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Straw fiber rolls with bio and photodegradable plastic netting.

UV-9 Straw Wattles

Erosion Control Function:

Used as a slope break to reduce travel distance of surface waters. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Straw Wattles shall be installed as shown on the plans. They shall be placed on contour and staked with 18- or 24-inch wood stakes at four feet on center. The ends of adjacent straw wattles shall be abutted to each other snugly.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The UV-9 straw wattles are manufactured from rice straw or other specified straw, and are wrapped in a tubular plastic netting. The netting has a strand thickness of 0.03 inch, and a knot thickness of 0.055 and a weight of 0.35 ounce per foot (each +/- 10%) and is made from 85% high density polyethylene, 14% ethyl vinyl acetate and 1% color for UV inhibition.
The UV-9 Straw Wattles™ are 9 inches in diameter (+/- one inch), and have a density weight of approximately 1.8 pounds per foot (+/- 10%). Maximum length is 25 feet long (+/- 0.5 feet).

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Plastic netting may entrap animals.

Advantages:

Lightweight, easy to install and remove.

Contact Information:
Distributor:

California Straw Works
5531 State Ave
Sacramento, CA 95819-1827
916 453.1456

Website

http://www.strawwattles.com/

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Manufactured with rice straw or other specified straw,encapsulated in bio and photo-degradable netting reduce slope length, slowing and spreading water flow. They diminish storm water pollution by capturing sediment. They are used to construct temporary diversion berms.

Erosion Control Products Fact Sheet
Vegetation Fascine - Circular Coir Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir fiber rolls made out of machine spun coir twine stuffed under pressure with mattress fiber either to standard weights or individual buyer's specifications.

Vegetation Fascine - Circular Coir Log

Erosion Control Function:

Used as a slope break to reduce travel distance of surface water. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Uses and conditions vary. Generally installed in a shallow trench constructed on contour. Staked 1.5 to 2 foot intervals. In wet areas, plants may be inserted into the fiber roll.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Stuffing: machine spun coir twine
Diameter: 15cm (6 inch) - 50cm (20 inch)
Length: 2 feet - 20 feet
Stuffed Weight: 5 - 8 kg/running meter
Outer Net made of bristle coir twines: (2"x2" mesh)
Twine Breaking Strength: minimum 80 lbs

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Heavier than straw wattles.

Advantages:

Lasts 3 to 5 times as long as straw wattles. Makes a good planting medium.

Contact Information:
Distributor:

Website

Manufacturer:

ExcelFiber (a division of ExcelHigh, Inc.)
350 5th Ave Suite 700a
New York, NY 10001
212 947-8543

Email

Website

http://www.excelhigh.com

Manufacturer's/Distributor's Comments:

The product can be supplied with synthetic netting. Available impregnated with coconut shell activated carbon. Coir log with planting holes also are available.

Erosion Control Products Fact Sheet
Vegetation Fascine - Square Coir Log

Caltrans
New Technology Report

Description:

Fiber rolls/wattles/logs.
Coir fiber rolls, made in a square shape. Made out of machine spun coir twine stuffed under pressure with mattress fiber either to standard weights or individual buyer's specifications.

Vegetation Fascine - Square Coir Log

Erosion Control Function:

Used as slope breaks to reduce travel distance of surface water. Also used as sediment catchment barriers.

Caltrans BMP ID
SC-5

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Uses and conditions vary. Generally installed in a shallow trench constructed on contour. Staked 1.5 to 2 foot intervals. In wet areas, plants may be inserted into the fiber roll.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Square Area 25x25 cm, 40x40 cm, 50x50 cm
Length: 2 feet - 20 feet
Stuffed Weight: 5 - 8 kg/running meter
Outer Net made of bristle coir twines (2"x2" mesh)
Twine Breaking Strength: minimum 80 lbs
The product can be supplied with synthetic netting.
Available impregnated with coconut shell activated carbon.
Coir log with planting holes also are available.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Proper installation is critical. Heavier than straw wattles.

Advantages:

Lightweight, easy to install and remove.Lasts 3 to 5 times as long as straw wattles. Makes a good planting medium. Square shape means more surface area contact in some applications.

Contact Information:

Distributor:

Website

Manufacturer:

ExcelFiber (a division of ExcelHigh, Inc.)
350 5th Ave Suite 700a
New York, NY 10001
212 947-8543

Email

Website

http://www.excelhigh.com/Coir_Fibre_Dept/Excelfibre/Erosion control/erosion control.html

Manufacturer's/Distributor's Comments:

Diameter: 25x25 cm, 40x40 cm, 50x50 cm
Length: 2 feet - 20 feet
Stuffed Weight: 5 - 8 kg/running meter
Outer Net: made of bristle coir twines (2"x2" mesh)
Twine Breaking Strength: minimum 80 lbs

The product can be supplied with synthetic netting.
Available impregnated with coconut shell activated carbon.
Coir log with planting holes also are available.

Erosion Control Products Fact Sheet
APS 600 Series Silt Stop

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polyacrylamide erosion control emulsion
A soil-specific tailored polyacrylamide copolymer liquid emulsion for erosion control. It reduces and prevents erosion of fine particles and colloidal clays from water.

APS 600 Series Silt Stop

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Applied with a water truck or hydroseeder or other spraying devices at a rate of 1-1/2 gallons per acre.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Specifications (Product Data):

Polyacrylamide erosion control emulsion.

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Formulations tailored to soil type.
Has no aquatic toxicity effect or change on soil pH.

Contact Information:
Distributor:

Hydrograss Technologies
157 Southbridge Rd
N Oxford, MA 01537
800 853-5393

Website

http://www.hydrograsstech.com/cleansing.html#700

Manufacturer:

Email

bob@hydrograsstech.com

Website

Manufacturer's/Distributor's Comments:

APS 600 Series Silt Stop®
Polyacrylamide Erosion Control Emulsion
A soil specific tailored polyacrylamide copolymer liquid emulsion for erosion control. It reduces and prevents erosion of fine particles and colloidal clays from water. Applied with a water truck of hydroseeder or other spraying devices at a rate of 1-1/2 gallons per acre.

Erosion Control Products Fact Sheet
ASB-45

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Dust control product - MFG says "approved by Caltrans".

No graphic available

ASB-45

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

It can be applied with standard hydraulic equipment including hydrosprayers & water trucks

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:

Notes:

Specifications (Product Data):

Acrylic copolymer. No other information available.

Construction Complexity: Medium

Ancillary Facilities:

It can be applied with standard hydraulic equipment including hydrosprayers & water trucks

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Albright Seed
487 Dawson Drive, Bay 5S
Camarillo, CA 93012
800 423-8112

Website
http://mars.he.net/cgi-bin/suid/~pauldaw/web_store.cgi?page=cat_other_soilbinders.html&cart_id=4600835.5478

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Dust control for traffic or non-traffic areas. Application rates on request. Approved by CALTRANS and other governmental agencies.

Erosion Control Products Fact Sheet
Atlas SoilLok

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil binder/polymer. Forms transparent membrane in which it binds soil with seeds, mulch, and fertilizer. Can be used in acidic or alkaline soils.

Atlas SoilLok

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Can be sprayed on the site with hydroseeding equipment. Applied to freshly graded slopes at a rate of 469 to 700 liters per hectare (50-75 gallons/acre). Extremely Challenging, Highly Unstable Slopes: 100+ gallons per acre. ATLAS SoilLok is normally diluted with water in a 1:20 ratio. However, ATLAS SoilLok can be mixed with water in any proportion. Apply the water-diluted ATLAS SoilLok uniformly to the soil surface requiring stabilization protection. Should be allowed to dry for 24 hours to set up. Holds seed in place until roots take hold.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

Non-toxic, biodegradable, leaves no undesirable residues in soil.
Physical state: Concentrate, liquid water-soluble. Milky white, polymer dispersion.
Density: 1.1 g/cm3
Viscosity: 8000+2000mPa.s at 20 C
pH value: 4 - 6
Solids component: 57.5 + 1.5 weight %

Construction Complexity: Medium

Ancillary Facilities:

Slope must be graded to avoid water concentration. This product is typically used with an erosion control seed mix. Other slope stabilization measures may be required, such as on-contour fiber rolls, stair-stepped slopes, mulch, etc.
Apply with a hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Inspect as per SWPPP for rills and erosion. Reapply where soil surface is disturbed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Non-toxic.

Contact Information:
Distributor:

Website

Manufacturer:

Quattro Environmental, Inc.
649 'I' Avenue
Coronado, CA
619 522-0044

Email

Website

http://www.kiwipower.com/

Manufacturer's/Distributor's Comments:

Soil binder, polymer. Forms unique, transparent membrane with a distinctive lattice-like structure within the topmost soil layer, ensuring the following advantages: soils and particles, seeds, mulch fibers, and fertilizers are fixed in an elastic matrix, retaining a flexibility that is frost-resistant and effective even with acidic and alkaline soils. Full rain and oxygen permeability is conserved by the distinctive network structure formed by an electrostatic bonding mechanism with the soil particles. Porous, water-insoluble lining does not re-hydrate, will hold through repeated waterings (rain or irrigation). Partial re-emulsifying characteristics of membrane allow "self-healing" of stabilized soil perimeter.

Erosion Control Products Fact Sheet
CalBinder

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil binder, dust control. This is an ammonium lignosulfonate product. It is a polymer and a byproduct of paper pulp production. It is non-toxic to people and the environment.

No graphic available

CalBinder

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
WE-1, SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Calbinder as a Dust Palliative:
Calbinder is used at the rate of 0.25 to 0.50 gallon per square yard, depending on the traffic density and loads.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

This is an ammonium lignosulfonate product. It is a polymer and a byproduct of paper pulp production.
(Major Component Analysis, 50% Dry Solids) 7.0 -Kjeldahl nitrogen
5.6 -Ammonia nitrogen
5.6 -Sulfur
12.7 -Acetic acid
47.1 -Lignin
22.6 -Total sugars

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as surface breaks down

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration. Sealed surface reduces water infiltration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

California -Fresno Oil Company
3242 E. Garrett
Fresno, CA 93706
559 486-0220

Website

http://www.calfresno.com/calbndr.html

Manufacturer:

California -Fresno Oil Company
3242 E. Garrett
Fresno, CA 93706
559 486-0220

Email

Website

http://www.calfresno.com/calbndr.html

Manufacturer's/Distributor's Comments:

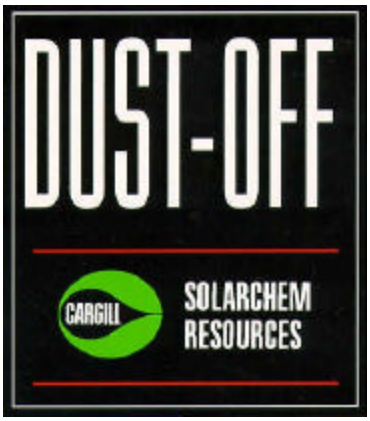
CalBinder is an ammonium lignosulfonate product from the forest products industry. When all factors are considered -- performance, cost, environmental safety, and quality -- it is superior to magnesium chloride or calcium chloride for road stabilization and dust control applications.

Erosion Control Products Fact Sheet
Dust-off

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Spray-on dust control.



Dust-off

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Spreader trucks with controllable pressure spray bars are best for applying Dust-Off. Most roads need little preparation before application. For optimum results, the road surface should contain a combination of aggregate and fines. Then, scarify to three to four inches, or a depth sufficient to remove potholes, washboarding, and furrows. Blade the road to a modified "A" crown, or to an appropriate slope for water drainage. Roads subject to very heavy traffic should be compacted after application. Oil-base treated surfaces may require special pre-treatment for positive penetration.

Effectiveness:

Confidence Level of Effectiveness Rating:

Notes:

Specifications (Product Data):

Magnesium (Mg++) 7.5%
Chloride (CI-) 21.0%
Sulfate (SO+) 3.0%
Potassium (K+) 0.7%
Water 66.2%
pH 6.5
Specific Gravity (at 60/60 F) 1.301
Pounds/Gallon 10.8

Construction Complexity: Medium

Ancillary Facilities:

Grader and water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

California -Fresno Oil Company
3242 E. Garrett
Fresno, CA 93706
559 486-0220

Website

http://www.calfresno.com/dustoff.html

Manufacturer:

Cargill

Email

Website

Manufacturer's/Distributor's Comments:

Calcium chloride and ordinary magnesium chloride dust suppressants can be highly corrosive. Once they mix with water and road soil, they form a mud that's more corrosive than road salt. This mud sticks to vehicles and steel surfaces and can accelerate rust and corrosion damage. With Dust-Off, you get dust control that's just as effective as calcium or ordinary magnesium chloride but with much less corrosion. Dust-Off, a superior magnesium chloride based formula, actually helps protect your vehicles, equipment and steel road structures from rust and corrosion. Think how much money that can save down the road.

Erosion Control Products Fact Sheet
EarthBound

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polyacrylamide (PAM). Designed to stabilize soil and act as a tackifier for straw or hydromulch. Lasts up to 6 months on the ground. Prevents crusting. Earthbound comes in a granular form. Need to have an agitator to mix it. Manufacturer also sells a liquid version, EarthBound-L

EarthBound

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. A polyacrylamide (PAM) is water-soluble. It acts as a flocculant and can absorb and release water over time. A PAM forms a lattice-like structure with the soil, which allows for better penetration of water into soil, thereby reducing soil erosion due to water runoff. It binds with soil through an ionic charge and can bind with all soil types in both acidic and alkaline situations. It also maintains the aggregate structure of the soil, even in wet conditions.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:

High

Notes:

Manufacturer claims it also aids the rate of plant emergence, perhaps by releasing water over time. EarthBound is available in 5-pound and 35-pound containers.

Specifications (Product Data):

polyacrylamide

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

EarthBound™ can be applied in any kind of weather and it is active and effective immediately. 5 to 20 pounds per acre.

Construction Complexity:
Medium

Ancillary Facilities:

Powder should be mixed using agitator system, manufacturer has liquid formulation for use in system w/out agitator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost:
Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Concentrated.

Contact Information:
Distributor:

Website

Manufacturer:

Earth Chem, Inc.
Fort Collins, CO
970 223-4998

Email

info@earthchem.com

Website

http://www.earthchem.com

Manufacturer's/Distributor's Comments:

The long, heavy molecules that make up EarthBound provide unparalleled strength in binding all types of mulch to the soil. EarthBound lasts longer than any other tackifier on the market today. There is no need to reapply tackifier and mulch after a few rains as EarthBound will last up to six months on the ground. Instead of using 100 pounds or more of plant-based tackifiers, EarthBound's advanced technology allows you to carry and handle as little as 5 pounds per acre. EarthBound is less expensive and more effective than plantago and guar-based tackifiers.

Erosion Control Products Fact Sheet
Earthguard

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil stabilization that increases water penetration for better seed germination.

Earthguard

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

EarthGuard® is formulated to protect exposed soil for up to 3 months. EarthGuard® is effective immediately and can be applied in any type of weather. EarthGuard® application rates depend upon field conditions and desired benefits.
The following chart can be used as general rate guidelines for partial seasonal erosion control (loamy soils that are balanced in organic matter and nutrients with a maximum rainfall of 6-9" over a 2-3 month period).

Slope	6h:1v	5:1	4:1	3:1	2:1	1.5:1	1:1
EarthGuard®	4	5	6	7	8	9	10 (gal/acre)

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

EarthGuard® is a proprietary blend of chemistry specifically designed to dramatically reduce erosion and silt pollution caused by rain and wind.

Construction Complexity: Medium

Ancillary Facilities:

Apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

Terra Novo
PO Box 81916
Bakersfield, CA 93380
888 843-1029

Email

sales@terranovo.com

Website

http://www.terranovo.com/

Manufacturer's/Distributor's Comments:

EarthGuardTM can be applied by itself for temporary erosion control lasting up to one season.

Mix EarthGuardTM with desired seed and mulch to create a permanent erosion control (tackifier not required). Unlike other products that shield water from entering the soil, EarthGuardTM is 100% water-soluble. It increases water penetration and retention time leading to improved seed germination, plant and sod establishment.

Recent results from the Caltrans Funded San Diego State University/Soil Erosion Research Lab demonstrates that EarthGuard® FM to be as effective as bonded fiber matrix and some erosion blankets and far more effective than other products currently available.

Erosion Control Products Fact Sheet
Envirotac ll

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil binder for dust control. Acrylic copolymer soil stabilizer.

Envirotac ll

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
WE-1, SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Mix with soil or spray on top

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

Acrylic copolymer: 39-43% by weight
Individual residual monomers: <0.1%
Aqua ammonia: <1.0%
Water: 57-61%

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as surface breaks down.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

Environmental Products and Applications, Inc.
10722 Arrow Route, Suite 116
Rancho Cucamonga, CA 91730
760 779-1814

Email

Website

http://www.envirotac.com/

Manufacturer's/Distributor's Comments:

When applied to various soils/sands, Envirotac II (acrylic copolymer soil stabilizer) penetrates and extends down below the surface to bond soils and particles together, thus preventing wind and water erosion. Envirotac II forms a plastic and resin film upon drying that allows water and air to penetrate, yet cements the soils and particles together to create a tough and durable layer of protection.

When increasing the concentrate application, the surface becomes durable, yet pliable and waterproof. This surface is hard enough to minimize surface damage and will not allow water or air to penetrate.

Erosion Control Products Fact Sheet
Fisch-Bond

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Dust control, tackifier, soil stabilizer. Food-grade, water clarifying polymer.

No graphic available

Fisch-Bond

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. Helps hold fiber, seed, and soil particles in place, aiding in the germination of seed for revegetation.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Apply with water truck, hydroseeder or other type of sprayer.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

100% polyacrylamide

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck, hydroseeder or other type of sprayer.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as surface breaks down.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
EPA-approved, food-grade

Contact Information:
Distributor:

Terra Firma Industries
6085 Zenith Court, NE
Rio Ranch, NM 87124
888 908-9222

Website

Manufacturer:

Email

Website

http://www.goldengateproducts.com/fb-combo-1.htm

Manufacturer's/Distributor's Comments:

Fisch-Bond is an EPA-approved, food-grade and water clarifying polymer. It is safe for the environment, plants, animals, and humans, and it is non-corrosive to equipment.

Fisch-Bond helps hold fiber, seed, and soil particles in place, aiding in the germination of seed for revegetation and stabilization of critically disturbed sites. It is also an excellent dust control product.

Erosion Control Products Fact Sheet
Micronized PAM

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polyacrylimide soil binder used to spray on slopes, binding soil particles together, improving soil aggregation and plant growth. Also helps control dust.

Micronized PAM

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Specifications (Product Data):

MP is a unique formulation of PAM (water-soluble polyacrylamide).

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and re-apply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

Soil Enhancement Technologies
7220 South Fraser Street
Englewood, CO 80112
310 640-6863

Email

Website

http://www.soilenhance.com/aboutus.cfm

Manufacturer's/Distributor's Comments:

Polyacrylimide
What is "MP" (Micronized PAM)?

"MP" (Micronized PAM) has been produced from commercial water-soluble polyacrylamide that is fully food grade. An alternating pressure system is used to reduce particle sizes from about 25 or fewer particles per inch to around 500 and more particles per inch. This means 1000 or more particles per unit of weight of the PAM. Some particles produced are smaller than 100 microns and some are smaller then 50 microns. The value of such small particle sizes is their speed of going into solution.
Dissolution time is reduced from up to 90 minutes to a matter of a few seconds. Solutions are ready for use in a minute to 20 seconds or less, depending on particle size. There are numerous advantages that result including being able to be added to irrigation streams rapidly without fear of partially dissolved particles clogging filters or emitters. "MP" (Micronized PAM) can be almost instantly usable in gypsum slurries and in soluble calcium solutions for injection into irrigation systems. This is not possible with conventional sized particles.

What "MP" (Micronized PAM) Does

"MP" (Micronized PAM) binds clay particles together to increase the size of soil aggregates so that air and water can more easily move in and out of soil. Existing soil aggregates are stabilized against the destructive forces of rain, irrigation water, or wind.

Erosion Control Products Fact Sheet
MULCHTACK41

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polyacryla mide-based tackifier with green marker dye. It is supplied in powder form. It can be mixed in a hydromulch slurry or sprayed on straw.

MULCHTACK41

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. MULCHTACK41 can be used as a soil binder by mixing in (harrowing, etc.) top of soil. It acts as a flocculant on small particles because the crystals have "hooks" that latch onto soil particles and hold them in place. It also helps with seed germination and plant growth by hydrating, then releasing water over time to the root system.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

It can be mixed in a hydromulch slurry or sprayed on straw.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Specifications (Product Data):

MULCHTACK41 is non-toxic, non-corrosive, and contains no asphaltic emulsion. Packaged in 50 lb bags.

Application rate with straw mulch tackifier (1 acre):
MULCHTACK41: 30 lbs
cellulose fiber: 150 lbs
water: 1,000 gal.

Application rate with fiber mulch tackifier:

Slope:	MULCHTACK41
6-1 to 2-1	30 lbs / acre
2-1 to 1-1	40 lbs / acre
>1-1 slope	60 lbs / acre

Location	***Soil Category***	***Steepness***
Rural	Rocky	> 1:1
Urban	Not rocky	

Construction Complexity: Medium

Ancillary Facilities:

Slope must be graded to avoid water concentration. This product is typically used with an erosion control seed mix. Other slope stabilization measures may be required, such as on-contour fiber rolls, stair-stepped slopes, mulch, etc.
Apply with a hydroseeder.

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340
770 303-0878

Website

http://www.herculesenvironmental.com/erosion.html#mulchtac

Manufacturer:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340
770 303-0878

Email

hercenv@herculesenvironmental.com

Website

http://www.herculesenvironmental.com/erosion.html#mulchtac

Manufacturer's/Distributor's Comments:

MULCHTACK41 is a superior, multi-purpose tackifier / binder of seed, fiber mulch, and straw. Also, it is a superior, well-known flocculent for soil. It can be mixed in the fiber mulch slurry or sprayed directly on straw. Tests have shown that it reduces sediment and seed loss, increases net water infiltration, and increases seed germination better than other tackifiers.

Erosion Control Products Fact Sheet
PennzSuppress D

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil binder and dust suppressant. Formulated from a water emulsified resin base, PENNZSUPPRESS D contains no asphalt or solvent.

PennzSuppress D

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Effectiveness:

Confidence Level of Effectiveness Rating:

Notes:

Specifications (Product Data):

Formulated from a water emulsified resin base, PENNZSUPPRESS® D contains no asphalt or solvent.

Location	Soil Category	Steepness
Rural	Rocky	Max. 1v:1h
Urban	Not rocky	

Caltrans BMP ID	SWMP Category
SS-5, WE-1	IB: Permanent

Caltrans Slope Type	Status
Fill	Approved Case by Case
Cut	

Installation/Application:

Typically, 1/4 gallon of diluted PENNZSUPPRESS® D per square yard is applied twice, in separate treatments, one after the other. The dilution ratio of PENNZSUPPRESS® D concentrate to water and the frequency of treatments will vary depending upon soil conditions, porosity, anticipated traffic, etc. To aid in determining the approximate square yardage of the area to be treated, and the approximate volume of diluted PENNZSUPPRESS® D to be applied, please refer to the chart on the webpage at http://www.pennzsuppress.com/html/erosion_control.htm

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck or hydroseeder.

Cost: Low

Issues and Concerns

Maintenance Requirements:
Repair and reapply as needed.

Maintenance Staffing/Equipment:
Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:
Medium

Constraints:
Rapid deterioration.

Advantages:
Rapid deployment for temporary soil stabilization.
Non-toxic.

Contact Information:
Distributor:

Website

Manufacturer:
Pennzoil
800 424-3907

Email

Website
http://www.pennzsuppress.com/html/erosion_control.htm

Manufacturer's/Distributor's Comments:
Formulated from a water emulsified resin base, PENNZSUPPRESS® D contains no asphalt or solvent, as is commonly found in other road dust suppressants. The binding agents in PENNZSUPPRESS® D are non-volatile, offering a lasting effect, unlike results obtained on roads treated with water alone. Concerns over the corrosive effects of road salts to vehicle underbodies are eliminated with the use of PENNZSUPPRESS® D, as it is non-corrosive to metal. Because this product contains water, it is non-flammable and safe during use. PENNZSUPPRESS® D is classified as "non-hazardous", "non-toxic", and "non-carcinogenic" according to Federal guidelines. It is also considered to be non-toxic to aquatic life.

Erosion Control Products Fact Sheet
PolyPavement

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Liquid soil solidifier. Water based polymer emulsion. Dust control.

PolyPavement

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Installation shall consist of spraying properly diluted PolyPavement Soil Solidifier onto the existing native soil surface in 3 spray-on applications. There will be (1) a surface preparation spray pass, (2) a surface penetration spray pass and (3) a surface toughening spray pass of properly diluted PolyPavement Soil Solidifier. PolyPavement Soil Solidifier shall be diluted and applied according to the manufacturer's custom prepared application instructions and as specified in these plans and the special provisions.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

PolyPavement Soil Solidifier contains three basic ingredients: polymers, water and emulsifiers.

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

PolyPavement
P.O. Box 36339
Los Angeles, CA 90036
323 954-2240

Email

tech@polypavement.com

Website

http://www.polypavement.com/

Manufacturer's/Distributor's Comments:

PolyPavement is a liquid soil solidifier. With PolyPavement, the existing in-place soil or a suitable imported soil is used for 98% of the pavement construction material. There are many traffic area applications and non-traffic area applications for PolyPavement.

PolyPavement passed all USACE performance criteria for rubber tire traffic and non traffic applications in all climates. No other material performed as well as PolyPavement and no other material had equivalent versatility, easy installation or as low a cost. Based strictly on the performance test results, USACE recommends PolyPavement for roads, helicopter landing pads, and other traffic and non-traffic surfaces in desert, tropic and temperate climates. No other method or material was recommended as highly.

PolyPavement Soil Soilidifier contains three basic ingredients. The ingredients are polymers, water and emulsifiers. Of course the polymers are the active ingredients; the water is the transport medium for the polymers and the emulsifiers are surface acting agents that keep the polymers suspended in the water. Emulsifiers are like soap or a detergent. They make the water wetter or give water greater ability to wet other materials. On the plus side, emulsifiers break surface tension and improve the seepage rate of the water through tightly packed soil particles. But on the minus side, an emulsifier draws water to itself. As long as emulsifiers are present in newly installed PolyPavement, the pavement has low resistance to water invasion.

Erosion Control Products Fact Sheet
PX-300

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
A blend of aqueous polymer emulsions that act to reduce erosion from wind and water. Soil binder.

PX-300

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

PX-300 is sprayed on the soil to be controlled. No compaction of the soil is required. PX300 is provided in 55-gallon drums of concentrate and then mixed on site with water. The dilution rate varies with the soil type and/or degree of slope of the terrain. Generally, the dilution rate is one part PX300 to 12 parts water.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

PX-300 is a special blend of aqueous polymer emulsions developed by the G. M. Boston Company. Development began in 1998 and several improvements have been made to the formula to increase its ability to bind soil particles, making the soil resistant to wind and water erosion.

Construction Complexity: Medium

Ancillary Facilities:

Grader and water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
It is non-toxic, non-carcinogenic, non-flammable, non-combustible.

Contact Information:
Distributor:

Website

Manufacturer:

G. M.Boston Company
412 Fullerton
Newport Beach, ca 92663
949 722-6799

Email

craighoad@gmbostoncompany.com

Website

http://www.gmbostoncompany.com/

Manufacturer's/Distributor's Comments:

What is the composition of PX-300?
PX-300 is a special blend of aqueous polymer emulsions developed by the G. M. Boston Company. Development began in 1998 and several improvements have been made to the formula to increase its ability to bind soil particles, making the soil resistant to wind and water erosion.

What kinds of soil can be stabilized with PX-300?
PX-300 can effectively stabilize many different kinds of soils: sand, gravel, silty soil, clays, volcanic ash, recycled asphalt or concrete, or combinations of these types of materials and soils.

Will PX-300 change the appearance of the natural soil material?
PX-300 is white in color, but will turn transparent as it dries. It therefore does not give an industrial look to native soil. This quality makes it effective for nature trails, or for application where a natural look is desirable.

Will PX-300 harm plants, animals, or aquatic life?
No. PX-300 is entirely non-polluting, and environmentally safe. It is non-toxic, non-carcinogenic, non-flammable, non-combustible. It can be safely used for hydroseeding.

Erosion Control Products Fact Sheet
R-2400

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil binder blend of psyllium, and a companion hydrocolloid.
Also used as additive to hydromulch.

No graphic available

R-2400

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place or sticking mulches together.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Application rates:
The recommended use rate for R-2400 is 50 pounds per acre. On slopes steeper than 2:1, use 100 pounds per acre.
Application is made with hydroseeding equipment, where it's sprayed evenly over the soil surface.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
High

Notes:

Specifications (Product Data):

R-2400 is a combination blend of psyllium, and a companion hydrocolloid

Construction Complexity: Medium

Ancillary Facilities:

Application is made with hydroseeding equipment, where it's sprayed evenly over the soil surface.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration. Slippery when wet.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:

Distributor:

Website

Manufacturer:

Reclamare
20727 7th Ave S
Des Moines, WA 98198-3408
206 824-2385

Email

sales@reclamare.com

Website

http://www.reclamare.com/

Manufacturer's/Distributor's Comments:

All revegetation and soil stabilization projects need protection from unplanned weather conditions. When applied over bared soil surface R-2400 dry powder agent provides protection from soil surface movement. When combined with mulch, seed and fertilizer, R-2400 provides stability during seed germination and young seedling growth. At heavier rates, R-2400 is used as a soil stabilizer.

A two unit hydrocolloid mix employing the popular psyllium ingredient. Low cost blend for large area stabilization. R-2400 is a combination blend of psyllium, and a companion hydrocolloid which will add slipperiness to the blend. The combination provides additional tacking properties. Suchcombination allows for attractive low cost material for use on average soil on slopes needing stability. The blend of two polysaccharides is easy to use and provides proper results needed for most areas being seeded.

Erosion Control Products Fact Sheet
Road Oyl

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Dust control and road construction. Non-asphaltic resin modified emulsion for RESIN PAVEMENT™ construction Formulated from tree-resin ingredients; it is non-ionic, neutral in electrical charge. An alternative to pavement and concrete road construction.

Road Oyl

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. Forms an emulsion over soil to provide a hard driving surface while providing dust and erosion control. Can be used for non-asphalt road construction in remote locations.

Caltrans BMP ID
WE-1, SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Apply with water truck, hydroseeder or other type of sprayer.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Use for temporary construction roads.

Specifications (Product Data):

Formulated from tree-resin ingredients

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck, hydroseeder or other type of sprayer.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Re-apply as surface breaks down.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Non-ionic, neutral in electrical charge.

Contact Information:
Distributor:

Soil Stabilization Products, Inc.
PO BOX 2779
Merced, CA 95344-0779
800 523-9992

Website

http://www.sspco.org

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Road Oyl is an advanced, cold-applied Resin Modified Emulsion that provides a unique, high strength answer for non-asphaltic RESIN PA VEMENT™ construction, for base course stabilization, and for requirements such as dust control, erosion control, prime coats, seal coats, sediment control, and other types of surface treatment applications.
Following are some of the project categories for which the ROAD OYL emulsion is uniquely suited:
(1) Remote projects where high strength flexible pavements are required at distant locations where hot mix material delivery is not feasible.
(2) Projects with special requirements for high stability 1 surface course pavement s, base course pavements or st abilized aggregate base course layers.
(3) Projects where owners, engineers, architects, landscape architects or historical restoration specialists desire pavements with a coloration or natural appearance which cannot be achieved with asphalt or concrete materials.
(4) Environmentally sensitive sites such as coastal estuaries and riparian areas, or highly regulated industrial locations and landfill facilities where the use of best available environmentally friendly technology is among the foremost criteria for selection of product technology.
Similar to asphalt pavement or concrete pavement installations (where the liquid asphalt or the cement is just a single component in a mix of materials, and where there are many steps from pavement mix design to having the final product in place and ready for service), a successful pavement installation using ROAD OYL Resin Modified Emulsion requires a high level of care in (1) planning, (2) selection of aggregate components and mix proportions, (3) construction procedures and (4) quality control monitoring throughout construction operations.

Erosion Control Products Fact Sheet
Seal

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Acrylic resin tackifier and dust control.

Seal

Erosion Control Function:

Decreases sediment runoff by binding soil particles or mu lches in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Hay & Straw Mulch Binding:
4:1 to 2:1 Slope - 20 gallons of Seal + 200 lbs cellulose fiber to 1000 gallons water per acre
< 4:1 Slope -10 gallons of Seal + 200 lbs cellulose fiber to 1000 gallons water per acre
> 2:1 Slope - 30 gallons of Seal + 200 lbs cellulose fiber to 1000 gallons of water per acre

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Specifications (Product Data):

1. Materials: Polyacrylamide, acrylamide copolymer, hydro-colloid polymers, marker dye.
2. pH Range: 7.0 plus or minus 0.2.
3. Surface Tension: 73.9 dynes/cm, based on simulated field application after 5 minutes of mechanical agitation.
4. Viscosity: 102 CPS plus or minus 2, Saybolt value, based on 30 pounds per 1000 gallons of water and 197 CPS plus or minus 2, Saybolt value, based on 60 pounds per 1000 gallons of water, based on simulated field application after 5 minutes of mechanical agitation.

Construction Complexity: Medium

Ancillary Facilities:

Apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization. University-tested to reduce erosion 68.6% and reduce water runoff 21.7% on a 45% slope without having to cure (dry out), effective immediately after hydroseeding application.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Straw Tacking and Dust Control tasks are handled quickly and effectively with Seal, a premium quality water emulsified acrylic resin designed specifically for application in any size hydraulic planter. It is a straw mulch and fugitive dust binder that disperses rapidly in water and never balls up. Pre-measured, mixes quickly.

Dust Control:
Non-Traffic Areas
25 gallons per 2500 gallons of water per acre
High Wind Exposure
20 MPH+, to seal soil surface use 25 gallons of Seal + 2000 lbs of cellulose fiber + 3000 gallons of water per acre. Depending upon microbial activity, this will be effective for 3 to 6 months.
Traffic Areas-5 gallons per 1000 gallon tank

Erosion Control Products Fact Sheet
Soil Master WR

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Dust control, liquid copolymer soil binder.

Soil Master WR

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Apply with water truck, hydroseeder or other type of sprayer.

General Usage Rates Per Acre:
For Soil Stabilization:
Soil Master WR™, 55-110 gal
Water, 1800 to 3000 gal

For Dust Control:
Soil Master WR™, 45-60 gal
Water, 600-1500 gal

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

NA

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck, hydroseeder or other type of sprayer.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
> 1:1

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as surface breaks down.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Bowman/Revex
14440 Mead Court
Longmont, Colorado 80504
Phone: 970/535-0863

Website

http://www.revex.com/tackifiers.html

Manufacturer:

Environmental Soil Systems, Inc.

Email

Website

http://www.revex.com/smstr_htm.htm

Manufacturer's/Distributor's Comments:

Soil Master WR is a blend of liquid co-polymers (with Tripolycate™) that is simply sprayed on. Mixed with water, it bonds soil to create a tough, water-resistant membrane. Use it as is for treatment against erosion.

Erosion Control Products Fact Sheet
Soil Seal

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Latex acrylic copolymer seals soil surface for soil stabilization.

Soil Seal

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

The standard ratio of water to concentrate is typically 30:1 although, the application rate will vary more widely depending on the soil characteristics; surface contour, severity and frequency of wind and rainfall, and whether Soil Seal is used as a sole treatment or in conjunction with hydroseeding or mulching. The Soil Seal solution will penetrate the soil surface to form a crust, the depth of which will vary from 1/8 inch to about 3/4 inch depending on soil characteristics, dilution percentage, and application rate.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

The soil stabilizing vehicle shall be a copolymer emulsion consisting of at least ninety percent acrylic. The acrylic emulsion shall be disbursed in water. The soil stabilizing compound shall include the constituent sodium silicate which facilitates the penetration of the compound into the earth, and which assists in creating a crust through the cohesive bonding of the surface soil particles to a depth sufficient to stabilize the soil surface. Further, the compound shall contain an antifoaming agent, allowing said compound to be mixed within a hydraulic applicating device without prohibitive foaming.

Construction Complexity: Medium

Ancillary Facilities:

Apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:
Repair and reapply as needed.

Maintenance Staffing/Equipment:
Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:
Medium

Constraints:
Rapid deterioration.

Advantages:
Rapid deployment for temporary soil stabilization.
Non-toxic

Contact Information:
Distributor:

Website

Manufacturer:
Soil Seal, Inc.
7766 Industry Avenue

Pico Rivera, CA 90660
Email

Website
http://www.soilseal.com

Manufacturer's/Distributor's Comments:
Soil Seal is a soil stabilizer, a means by which the surface of the soil can be stabilized in place against the ravages of wind and water.
It is a patented formulation composed primarily of high grade latex acrylic - balanced co-polymers prepared in emulsion form - which is typically reduced with water to be spray applied to various types of soils. Soil Seal penetrates the soil surface and forms an excellent cohesive bond between the soil particles. It can be used as a sole treatment in combating soil erosion, or as a tackifier in hydroseeding and mulching applications. It is a non-toxic, non-corrosive, non-flammable auxiliary soil chemical formulated to provide safe and economical surface soil stabilization.

Erosion Control Products Fact Sheet
Soil-Sement

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil~Sement® provides dust control on building pads, open areas and stockpiles, road stabilization, erosion control on slopes and as a tackifier in hydroseeding applications.

Soil-Sement

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Mix with water and spray on soil to control dust as well as sediment runnoff. Can also be added to hydromulch as a tackifier. Follow manufacturer's instructions for intended application.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:

Notes:

Specifications (Product Data):

Soil-Sement is a polymer emulsion that is considered non-hazardous by OSHA, DOT and EPA.

Construction Complexity: Medium

Ancillary Facilities:

Hydraulic spray equipment, available water.

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect. Laborer to repair.

Maintenance Level of Effort:

Low

Constraints:

Need to periodically reapply to maintain effectiveness.

Advantages:

Easy to apply.

Contact Information:
Distributor:

Website

Manufacturer:

Midwest Industrial Supply
480 Mannel Avenue P.O. Box 717
Shafter, ca 93263
661 746-3783

Email

FrankE@midwestind.com

Website

http://www.midwestind.com/problemsolver/product.cfm/productid/30

Manufacturer's/Distributor's Comments:

Soil~Sement® is applied to a wide range of surfaces and substrates to prevent fugitive dust as well as provide erosion control that results in sedimentary delivery reduction and soil stabilization. Areas of application include but are not limited to unpaved roadways and open areas consisting of soil from clays, to silty, sandy loams, and well graded aggregates.

Soil~Sement® is also applied to storage piles consisting of coal, mineral, ore and limestone; as well as mine tailings, ash ponds and landfills.

Soil~Sement® can be utilized at stabilizing and encapsulating radioactive and asbestos containing soils reducing the risk of contamination to air, water and human health.

Soil~Sement® is utilized on military helicopter landing pads, air strips and tank trails and used in a multitude of construction site activities to assist in compliance with air quality and NPDES (National Pollution and Discharge Elimination System) Stormwater requirements.

Soil~Sement® provides dust control on building pads, open areas and stockpiles, road stabilization, erosion control on slopes and as a tackifier in hydroseeding applications.

Soil~Sement® used as a stabilization additive will improve both the dry and wet strength of the stabilized soil. The reduction in PM10 emissions will vary depending on surface substrate, Soil~Sement® volume and frequency of application, environmental conditions and the volume and nature of traffic.

Erosion Control Products Fact Sheet
SOILOC-MQ

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Dust control. Liquid acrylic resin to be sprayed on soil for dust suppression, erosion control. Designed for mines and quarries, may work on road cuts and fills.

No graphic available

SOILOC - MQ

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

SOILOC-MQ is intended to be used on mine & quarry sites. It is designed to be sprayed over disturbed soil, haul roads, sand, coal, coke, ore, lime, slag, ash & other fine powders. When dried the material forms a crusty seal reducing airborne dust (PM-10) and erosion. It can be applied with standard hydraulic equipment including hydrosprayers & water trucks.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:

Notes:

Specifications (Product Data):

Material Description: Polymer:
SOILOC-MQ is a liquid blend of acrylic resins.

Construction Complexity: Medium

Ancillary Facilities:

It can be applied with standard hydraulic equipment including hydrosprayers & water trucks.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340
770 303-0878

Website

http://www.herculesenvironmental.com/dust.html

Manufacturer:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340
770 303-0878

Email

hercenv@herculesenvironmental.com

Website

http://www.herculesenvironmental.com/

Manufacturer's/Distributor's Comments:

SOILOC-MQ
LIQUID DUST SUPPRESSANT FOR MINES & QUARRIES (pm-10)

Material Description: Polymer:
SOILOC-MQ is an economical, liquid blend of acrylic resins. It is supplied in a milky white, highly concentrated form to be diluted with water prior to use. Dries clear. Environmentally safe. Non-corrosive to metal. Meets all requirements for non-asphaltic emulsions.

Intended Use:
SOILOC-MQ is intended to be used on mine & quarry sites. It is designed to be sprayed over disturbed soil, haul roads, sand, coal, coke, ore, lime, slag, ash & other fine powders. When dried the material forms a crusty seal reducing airborne dust (PM-10) and erosion. It can be applied with standard hydraulic equipment including hydro-sprayers & water trucks.

Erosion Control Products Fact Sheet
SOILOC-E

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polymer-based soil binder, hydromulch binder/tackifier. It can be used with water as a bare soil binder for water erosion and dust control or in a hydromulch slurry. It acts like a glue, but when dried it will not be weakened by water.

No graphic available

SOILOC-E

Erosion Control Function:

Decreases sediment runoff by binding soil particles or mulch in place.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Mix with water and spray on soil. Or mix with hydromulch.
Tackifier for straw or mulch:
Application rate: Covers 1 acre
SOILOC-E (Concentrate) Water
Flat surface * 55 - 165 gal 1,000 gal
1:1 slope * 75 - 165 gal 1,000 gal

*When applying with a hydrosprayer add 200 lb cellulose fiber / acre.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

Liquid blend of acrylic resins.

Construction Complexity: Medium

Ancillary Facilities:

Slope must be graded to avoid water concentration. This product is typically used with an erosion control seed mix. Other slope stabilization measures may be required, such as on-contour fiber rolls, stair-stepped slopes, mulch, etc.
Apply with a hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Non-phytotoxic to plants

Contact Information:
Distributor:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340
770 303-0878

Website

http://www.herculesenvironmental.com/erosion.html#mulchtac

Manufacturer:

Email

hercenv@herculesenvironmental.com

Website

http://www.herculesenvironmental.com

Manufacturer's/Distributor's Comments:

SOILOC-E is an economical liquid blend of acrylic resins. It is supplied in a milky white, highly concentrated form to be diluted with water prior to use. Dries clear. Environmentally safe, non-phytotoxic to plants. Meets all requirements for non-asphaltic emulsions.

Erosion Control Products Fact Sheet
SOILPAM

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polymer soil amendment. Typically is sprayed on soil to allow better water penetration.

SOILPAM

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. A polymer that improves soil structure by aggregating soil particles. This in turn provides a better medium for plant cover which provides the long-term erosion control function.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

SOILPAM™ is metered or injected into the irrigation water or is placed in the water flow during initial advance across a field.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness. This formulation is for overhead irrigation application. It breaks down into carbon dioxide, water and, ammonium-N.

Specifications (Product Data):

Polymer

Construction Complexity: Medium

Ancillary Facilities:

A method for delivery of polymer to soil, either through an irrigation system or sprayed on from a tanktruck, etc.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Non-toxic

Contact Information:

Distributor:

Website

Manufacturer:

Earth Chem, Inc.
Fort Collins, CO
970 223-4998

Email

info@earthchem.com

Website

http://www.earthchem.com

Manufacturer's/Distributor's Comments:

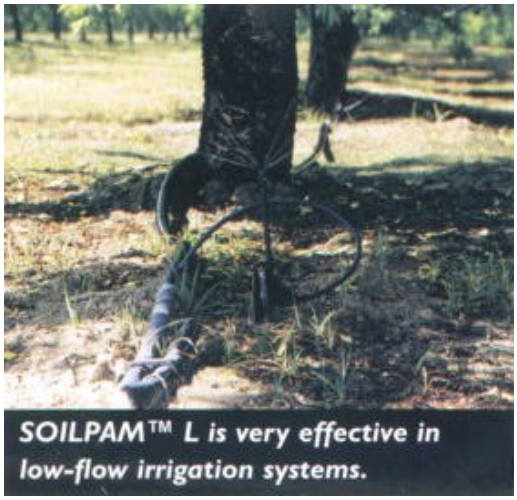
Polymer soil amendment, SOILPAM, is specifically formulated to stabilize soil structure, which dramatically increases crop emergence, increases water infiltration, improves erosion control, decreases soil crusting, and provides crop yield benefits. SOILPAM is very environmentally safe because it breaks down into carbon dioxide, water, and ammonium-N under field conditions. SOILPAM is the fastest growing irrigation technology today. Following years of research, the government began actively promoting its use in the early to mid 1990s for erosion control. SOILPAM protects the environment and precious top soil.

Erosion Control Products Fact Sheet
SOILPAM L

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Polymer soil amendment. Increases water penetration and water retention; reduces soil crusting. Used with low-flow irrigation systems.



SOILPAM™ L is very effective in low-flow irrigation systems.

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. A polymer that improves soil structure by aggregating soil particles. This in turn provides a better medium for plant cover which provides the long term erosion control function.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

SOILPAM™ L is injected into the irrigation water flow with a pump or eductor.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness. Mainly used in agricultural settings and sprayed through sprinklers or used in furrow irrigation. It breaks down into carbon dioxide, water, and ammonium-N.

Specifications (Product Data):

Polymer

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

Earth Chem, Inc.
Fort Collins, CO
970 223-4998

Email

info@earthchem.com

Website

http://www.earthchem.com

Manufacturer's/Distributor's Comments:

Polymer, reduces crust, reduces erosion, increases water infiltration, and enhances water retention. Through these mechanisms, SOILPAM™ L increases plant emergence, enhances stand establishment, and provides crop yield benefit.

Erosion Control Products Fact Sheet
Terra Control

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil stabilization polymer creates a 3D membrane holding soil particles together.

No graphic available

Terra Control

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Application Rate
Standard Treatment: 65-75 gallons per acre.
Dust Control: 15-25 gal per acre.
Normally diluted w/ water in 1:20 ratio (ie, 75 gals Terra-Control with 1,500 gals water). Terra-Control can be diluted to other concentrations, up to 1:5 as needed by site. Stabilization is a function of penetration depth, site soil properties and quantity of Terra-Control applied. Apply only in dry weather to allow proper drying.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

Made from new materials and consistently manufactured to exacting standards, Terra-Control uses no "off-spec" polymers or acrylates, as many others do. This ensures the highest quality control and reliable binding performance but will not "shellac" the soil or cause any sheeting of water.

Construction Complexity: Medium

Ancillary Facilities:

Apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Rated safe for sensitive wetlands with very low aquatic toxicity.

Contact Information:
Distributor:

Website

Manufacturer:

Quattro Environmental, Inc.
649 'I' Avenue
Coronado, CA
619 522-0044

Email

info@kiwipower.com

Website

http://www.kiwipower.com/

Manufacturer's/Distributor's Comments:

Designed specifically for environmentally sensitive sites requiring a heavy-duty soil stabilizer. Terra-Control meets the higher require ments for non-toxic biodegradability while maintaining a strong, porous, three-dimensional matrix for up to 18 months.
Key Benefits Include:
1. Environmentally Safe: the "cleanest" soil binder available.
2. Permeable Matrix: forms porous 3-d membrane, enhances germination in many species.
3. Consistent Formulation: made from new materials, not "off-spec" polymers or acrylates.
4. Moisture Retention: protects soil and plants from drying out and enhances water infiltration in compacted soils.
5. Superior Erosion Control: against rain & wind, prevents nutrients from washing away, excellent dust suppression, partially re-emulsifies to "self-heal" cracks.

Environmentally Safe
When the project specs require it or the site needs demand it, Terra-Control gives you superior holding power, pure biodegradability, and no undesirable residue. It is non-phytotoxic to sensitive plants, including turf grasses, and has an excellent eco-toxicological profile.Terra-Control is rated safe for sensitive wetlands with very low aquatic toxicity, and because no individual components can be washed out there is no danger of ground water pollution.

Erosion Control Products Fact Sheet
Top-Seal

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Copolymer dust control agent.

Top-Seal

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

For standard moisture and soil conditions, Top-Seal is mixed at 1:5. To determine how much Top-Seal you need:

Multiply square meters times 0.555 to determine the amount of Top-Seal needed to treat that area 15 cm deep. Again, this amount would also be used for dust or erosion control on this area.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Hydraulic soil stabilizers have a wide variability in the range of effectiveness.

Specifications (Product Data):

Copolymer

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
It contains no chemicals which could be harmful to humans, plants, animal life, or equipment.

Contact Information:
Distributor:

Frank Quirk and Associates
3203 S. Fort Hood Road, #24
Kileen, TX 76542
254 628-7665

Website

Manufacturer:

Soils Control International Inc

Email

Website

http://www.vvm.com/~fquirk/tsinfo.html

Manufacturer's/Distributor's Comments:

Top-Seal Liquid Soil Sealant is an environmentally safe, low cost chemical solution which is mixed with water and applied to soil with results of up to 100% dust control and elimination of problems associated with soil erosion. As a barrier against moisture, Top-Seal is so effective that, when used in sufficient concentrations, it can be transformed into a flexible liner which could be useful in the fortification of ponds, embankments, and landfills.

When properly applied in the sufficient quantities, Top-Seal will quickly dry into a hardened membrane which will trap and bind soil particles and loose aggregate. As a side benefit, it will provide excellent upper level (top 2" or 5 cm) base stabilization.

Unlike many other liquid dust control or stabilization products, Top-Seal will not re-disperse in water or rain, and it is not affected by degradation from alkaline materials and sunlight. Top-Seal is easy to use. In most cases, it is simply applied to the soil and the job is finished. Top-Seal contains no petroleum products, enzymes, acids, or chlorides. It contains no chemicals which could be harmful to humans, plants, animal life, or equipment.

Erosion Control Products Fact Sheet
VEGECOL

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
100% plant-based stabilizer used for hydroseeding. It contains uronic acids and sulphated water-soluble galactose polymers.

VEGECOL

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place. Helps to bind together soil particles. Bound soil particles are less likely to be mobilized by wind or water.

Caltrans BMP ID
SS-5, WE-1

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Spray on with hydroseeder.
10 to 30 kg/ha

Use: relatively easy to difficult substrates, or outside periods favorable for sowing.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Concentrated powder binder, 100% plant / concentrated algae.

Construction Complexity: Medium

Ancillary Facilities:

Spray on with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration.

Advantages:

Rapid deployment for temporary soil stabilization.
Good adherence and longevity (3 to 4 months).

Contact Information:
Distributor:

Euro-Tec
130 Avenue St-Exupéry
BRON, France 69500
33 4 72 78 84 90

Website

http://www.euro-tec.fr/fixategb.htm

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

An economical, highly effective stabiliser used for hydroseeding.

VEGECOL has been used to treat more than 4000 hectares in over 15 countries by hydroseeding. It is the only 100% plant-based stabiliser in use. It contains 80% plus uronic acids and sulphated water-soluble galactose polymers. This combination enables use of the product in a broader pH spectrum than would be possible if only uronic acids were present.

It is rich in high quality colloids, which give it exceptional binding and film forming properties thanks to its ability to form aggregates.

Erosion Control Products Fact Sheet
Zip-Seal

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Liquid soil binder for water and wind erosion and dust control. Originally formulated for mixing with soil to create solid base for roadways, it can also be sprayed on top of soil for wind and water erosion control.

Zip-Seal

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place.

Caltrans BMP ID
WE-1, SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Mix with soil or spray on top.
Optimum moisture content should be reached with a mixture of water and Zip-Seal in order for most soils to be properly treated. A typical dilution for an average soil conditions a rate of approximately one-half gallon per square yard or 2.25 liter per square meter. If this amount is not sufficient to reach optimum moisture content, then more mixture should be applied at the same rate of dilution. One gallon of Zip-Seal will generally cover about 20 square yards. One liter will cover about 4.5 square meters.

Effectiveness:

Confidence Level of Effectiveness Rating:

Notes:

Specifications (Product Data):

Specification Analysis
Appearance: Milky White-Tan
Cures: Clear
Odor: Slight Amine
Solubility in Water: Dilutable
Non-Violatiles: 39-41%
Specific Gravity: 1.1
pH: 8.5
Proprietary Compounds: Virgin Raw Material
Environmental & Safety: Environmental Safe
Considerations: No Requirements for Hazardous Warning Labels

Construction Complexity: Medium

Ancillary Facilities:

Apply with water truck.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as surface breaks down

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration. Sealed surface reduces water infiltration.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

Innovative Products Industries
1721 Colburn St.
Honolulu, HI 96819-3244
808 842-1150

Email

kaloha@aloha.com

Website

http://www.aloha.com/~kaloha/innovative/zipseal.html

Manufacturer's/Distributor's Comments:

Zip-Seal is a specially formulated, environmentally safe liquid soil binder. When diluted with water, it will bind and transform various soil types into a solid mass of tightly cemented soil particles. It will increase the soil bearing capacity and create a much greater resistance to moisture.

Erosion Control Products Fact Sheet
Co-Polymer Gel

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment; polymer used to increase water retention for plants. Hydroseed, hydromulch additive.

Co-Polymer Gel

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Broadcast onto soil surface and mix in. Or add to hydroseed mix.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Copolymer of acrylamide.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:
Low

Constraints:
Very slippery when wet.

Advantages:
Increases soil water holding capacity.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:
Copolymer of acrylamide, a super absorbent holding up to 400 times its weight in distilled water. Ideal for laying sod, landscaping and as a root dip for transplants. Available in four different particle sizes.

Erosion Control Products Fact Sheet
Locking Fibers

Caltrans
New Technology Report

Description:

Hydroseed/hydromulch additive.
Crimped polyester fibers added to hydromulch.

Locking Fibers

Erosion Control Function:

Additives increase effectiveness of hydroseed/hydromulch application.

Caltrans BMP ID

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Locking Fibers should be added to the hydroseeder tank when the water level reaches approximately 1/3 full. Engage the agitator and recirculation valve, introduce the fibers, then add seed, fiber mulch, fertilizer.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:

Low

Notes:

Correct application per product is critical.

Specifications (Product Data):

Net Weight: 10 lbs / case
Fiber Content: Polyester
Fiber Diameter: 4.5 Denier
Fiber Length: 0.5 inches
Fiber: Crimped
Polymer: Polyacrylamide
Surface Tension*: 62.3 Dynes / CM
pH Range: 6.71 ± 0.2
* Locking Fibers were tested for surface tension at a rate of 20 lbs per 1000 gallons of water after simulated mechanical agitation of 5 minutes.

Construction Complexity: Low

Ancillary Facilities:

Add to a selected hydromulch

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Fibers can become airborne and could cause eye irritation.

Advantages:

Absorbs water immediately and disperses rapidly to form a homogenous slurry. Increases the mechanical bond of all types of fiber mulch. Increases shooting distance of mulch slurry.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Locking Fibers are individually crimped polyester fibers (1/2 inch length pieces) that absorb water immediately and disperse rapidly to form a homogenous slurry. It increases the mechanical bond of all types of fiber mulch, as well as the shooting distance of mulch slurry.

Erosion Control Products Fact Sheet
Poly-Fibres

Caltrans
New Technology Report

Description:

Hydroseed/hydromulch additive.
Photodegradable polyester fibers added to hydromulch to increase bonding.

Poly-Fibres

Erosion Control Function:

Additives increase effectiveness of hydroseed/hydromulch application.

Caltrans BMP ID
None

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Add Profile Poly-Fibres to hydraulic seeder once water level is approximately 1/3 full. Then load seed, soil amendments, fiber mulch, tackifier and fertilizer to slurry.
3 to 1 slope.....20 lbs per acre
>2 to 1 slope.....30 lbs per acre

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Correct application per product is critical.

Specifications (Product Data):

Polyester 1/2 - 3/4 inch
Fiber texture: cut staple
Fiber diameter: 1.5 denier
Ph range: 6.75 ± 1

Construction Complexity: Low

Ancillary Facilities:

Add to a selected hydromulch

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Reduces the paper mache effect of 100% cellulose fiber mulches, and increases the shooting distance of the fiber mulch slurry.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Poly-Fibres are photo-degradable 1/2 to 3/4 inch long polyester fibers that have been treated to absorb water rapidly and to disperse evenly in water. It increases the mechanical bond of all types of hydraulic mulches, reduces the paper mache effect of 100% cellulose fiber mulches, and increases the shooting dis tance of the fiber mulch slurry.

Erosion Control Products Fact Sheet
R-2400

Caltrans
New Technology Report

Description:

Hydraulic soil stabilizer.
Soil binder blend of psyllium, and a companion hydrocolloid.
Also used as additive to hydromulch.

No graphic available

R-2400

Erosion Control Function:

Decreases sediment runoff by binding soil particles in place or sticking mulches together.

Caltrans BMP ID
SS-5

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Application rates:
The recommended use rate for R-2400 is 50 pounds per acre. On slopes steeper than 2:1, use 100 pounds per acre.
Application is made with hydroseeding equipment, where it's sprayed evenly over the soil surface.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
High

Notes:

Specifications (Product Data):

R-2400 is a combination blend of psyllium, and a companion hydrocolloid

Construction Complexity: Medium

Ancillary Facilities:

Application is made with hydroseeding equipment, where it's sprayed evenly over the soil surface.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Rapid deterioration. Slippery when wet.

Advantages:

Rapid deployment for temporary soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

Reclamare
20727 7th Ave S
Des Moines, WA 98198-3408
206 824-2385

Email

sales@reclamare.com

Website

http://www.reclamare.com/

Manufacturer's/Distributor's Comments:

All revegetation and soil stabilization projects need protection from unplanned weather conditions. When applied over bared soil surface R-2400 dry powder agent provides protection from soil surface movement. When combined with mulch, seed and fertilizer, R-2400 provides stability during seed germination and young seedling growth. At heavier rates, R-2400 is used as a soil stabilizer.

A two unit hydrocolloid mix employing the popular psyllium ingredient. Low cost blend for large area stabilization. R-2400 is a combination blend of psyllium, and a companion hydrocolloid which will add slipperiness to the blend. The combination provides additional tacking properties. Suchcombination allows for attractive low cost material for use on average soil on slopes needing stability. The blend of two polysaccharides is easy to use and provides proper results needed for most areas being seeded.

Erosion Control Products Fact Sheet
Slicky Sticky

Caltrans
New Technology Report

Description:

Hydroseed/hydromulch additive.
Polyacrylamide tackifier also lubricates to help hydromulching and hydroseeding pumping.

Slicky Sticky

Erosion Control Function:

Additives increase effectiveness of hydroseed/hydromulch application.

Caltrans BMP ID
None

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Add to hydromulch slurry. Slicky Sticky® provides soil erosion protection and lubrication at rates as low as 3 ounces per bag of mulch. However, research indicates that ½ to ¾ of a pound per 1,000 square feet of application provides erosion benefits superior to guar.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Correct application per product is critical.

Specifications (Product Data):

Slicky Sticky® is a high quality polyacryla mide, specifically formulated as a hydroseeding mulch additive.
Slicky Sticky® is packaged in an easy-to-pour, 15 pound plastic bottle with a screw-on lid.

Construction Complexity: Low

Ancillary Facilities:

Mix and apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Slippery when wet.

Advantages:

Lubricates hydromulch mixture, increases mulch dispersal, helps stick hydromulch fibers in place once on the ground.

Contact Information:
Distributor:

Website

Manufacturer:

James Lincoln Corporation
800 274-2304

Email

Website
http://www.jameslincoln.com

Manufacturer's/Distributor's Comments:

SlickySticky® is a high quality polyacrylamide, specifically formulated as a hydro-seeding mulch additive. It is fully biodegradable, environmentally safe, and E.P.A. exempt.

SlickySticky® is packaged in an easy-to-pour, 15 pound plastic bottle with a screw-on-lid. This convenient packaging helps avoid slippery machine decks caused be wet or torn bags, or spilled product.

SlickySticky® provides soil erosion protection and lubrication at rates as low as 3 ounces per bag of mulch. However, research indicates that ½ to ¾ of a pound per 1,000 square feet of application provides erosion benefits superior to guar.

Prevents Machine Clogging
SlickySticky® makes any mulch product, paper or wood, very slippery and easier to pump. SlickySticky® is 6 to 8 times more slippery than guar, so clogging is highly unlikely in any machine, and virtually no clogs during applications with long hoses.

Better Mulch Performance
SlickySticky® has a profound effect on the performance of paper or wood fiber mulch. SlickySticky® allows coverage of 1¼ to 1½ times the land area using the same amount of mulch. And, when SlickySticky® is applied, mulch longevity is increased, further stabilizing the soil until the planted seed becomes established.

Erosion Control Products Fact Sheet
Tackifibers

Caltrans
New Technology Report

Description:

Hydroseed/hydromulch additive.
Polypropylene fibers to add to hydromulch to improve structure and bonding. Soil stabilization.

No graphic available

Tackifibers

Erosion Control Function:

Additives increase effectiveness of hydroseed/hydromulch application.

Caltrans BMP ID
None

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Application Instructions
Apply Tackifibers at a rate of 20 lbs [40 lbs] per acre. While loading hydroseeder tank with water, organic soil amendments and binders, and with agitator in operation, slowly add Tackifibers to tank by vigorously shaking and dispersing handfuls of fibers. This will prevent clumping of the fibers and potential plugging of the equipment. Once hydroseeder is driven to seeding site, add seed.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Correct application per product is critical.

Specifications (Product Data):

Tackifibers are 1/2" polypropylene fibers specially formulated to enhance the performance of hydraulically-applied protein-rich mulch and soil binder/tackifier seeding slurries.

Construction Complexity: Low

Ancillary Facilities:

Hydroseeder capable of passing Takifibers

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Limited access for specialized equipment

Advantages:

Tackifibers greatly enhance the holding performance of mulches and tackifiers by providing mechanical cross bonding of fibers.

Contact Information:
Distributor:

Website

Manufacturer:

Quattro Environmental, Inc.
649 'I' Avenue
Coronado, CA
619 522-0044

Email

Website

http://www.kiwipower.com/

Manufacturer's/Distributor's Comments:

Tackifibers are 1/2" polypropylene fibers specially formulated to enhance the performance of hydraulically-applied protein-rich mulch and soil binder/tackifier seeding slurries. When added to standard slurry mixtures, Tackifibers create a highly tenacious, stable mulch mat. This durable mat mechanically bonds tightly to the soil surface and: Protects germinating seeds from wind and water erosion. Allows the soil to breath. Provides structural integrity to the binder slurry.

Increased Holding Power
Tackifibers greatly enhance the holding performance of mulches and tackifiers by providing mechanical cross bonding of fibers. Unlike short term, water-soluble tackifiers, Tackifibers persist under prolonged periods of wet weather.

Holds For Full Season
Photo-degradable Tackifibers are designed to hold the soil for a full growing season. As photo-degradation progresses, the fibers are broken down into shorter and shorter segments, which become part of the soil and then undergo biological degradation.

Tackifibers Advantages
Reduces bulk! Maintains predetermined holding performance with less mulch/tackifier. High tenacity, even in wet conditions.
Consistent, long fiber length. Enhances the holding performance of mulch/tackifiers. Increases spray distance. Reduces paper mulch mache effect.

Erosion Control Products Fact Sheet
Aspen Fibers Turbo Mulch

Caltrans
New Technology Report

Description:

Hydromulch.
Made with aspen wood fiber.

Aspen Fibers Turbo Mulch

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seeds.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment.
Application:
1200 - 1500 lbs. per acre on 3:1 slopes or less; 2000 lbs. per acre on slopes steeper than 3:1.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Aspen fibers and recycled cellulose material
Specifications:
Moisture Content: .10 +/- 3%
Organic matter: .97 +/- 2%
Ash content: .8 +/- 2%
pH: 4.8 +/- 5%

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces.

Contact Information:

Distributor:

Website

Manufacturer:

Buckley Powder Co., Geo-Fabrics/Erosion Control Division
42 Inverness Drive East
Aspen, CO 80112

Email

Website

http://westernexcelsior.com/products4.html

Manufacturer's/Distributor's Comments:

Aspen-Fibers Turbo Mulch is highly effective in controlling soil erosion and water runoff on practically any terrain! With its exclusive no-clog formulation, smooth consistency and non-toxic dye, it's easier than ever to bring hydraulic mulching to landscaping, farming, and other applications. It's especially effective in hard-to-reach areas where traditional mulching is impossible! Because Turbo Mulch is blended from extreme ly economical substances - Aspen fibers and recycled cellulose material - the cost is kept well below that of other hydraulic mulches. And when you consider how this unique product creates a blanket of nutrients for your seeds, resulting in plants that are taller, heavier and healthier, turbo mulch is unbeatable value! Designed to stabilize soil, control erosion and water runoff, and promote vegetation, Aspen Fiber Turbo Mulch makes hydraulic mulching easier and more effective than ever! Because of its unique water absorbing properties, Turbo Mulch mixture won't clog your equipment. And Turbo Mulch flows smoothly and evenly for consistent distribution. After application, the Turbo Mulch fibers form a stable layer of nourishment that protects seeds and encourages growth.

Erosion Control Products Fact Sheet
Cellulose Fiber

Caltrans
New Technology Report

Description:

Hydromulch.
Cellulose fiber hydromulch.

Cellulose Fiber

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment After filling the hydraulic seeder with water, add Cellulose Fiber mulch and any other amendments.
Application Rates:
Moderate to 3 to 1 Slope: 1500 lbs per acre
3/1 to 2/1 Slope: 2000 lbs per acre
Greater than 2 to 1 Slope: 2500 lbs per acre
Hay and Straw Mulch Binding: 750 lbs per acre

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Physical Properties:
Moisture Content: 12% +-3
Organic content: 98.4%+-2
Ash Content: 1.6%+-2
pH Range: 5.5 +-1
Water Holding Capacity: 900% Min.
Fiber Mulch Viscosity: 1.55 CPS+-.10

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Can be used in any hydroseeder.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

Ideal for hydroseeding and tacking straw or hay mulch, our cellulose fiber mulch is produced from clean recycled newsprint specifically for use in hydraulic seeders. Cellulose loads, mixes, and sprays well in all types of hydro-seeding equipment, large and small, old and new, both mechanically-agitated and jet-agitated.

Erosion Control Products Fact Sheet
Coir Mulch

Caltrans
New Technology Report

Description:

Hydromulch.
Coir fiber mulch used for hydromulching

Coir Mulch

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment. Approximately 2000 lbs/acre is recommended.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Coir mulch is a mix of 65% coir fiber (less than 0.5" long) and 35% coir dust. Coir mulch is available in 60 lbs. bags. Using coir mulch in hydroseeding mixtures provide a better medium for seed germination. The coir fiber in the coir mulch provides the structural stability to the hydromulch mix.

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Coir is reputed to be a good growth medium.

Contact Information:
Distributor:

Website

Manufacturer:

Rolanka
800 760-3215

Email

Website
http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

Mulch for hydroseed, hydromulch

Erosion Control Products Fact Sheet
Conwed Enviroblend

Caltrans
New Technology Report

Description:

Hydromulch.
Wood and paper fiber hydromulch for flat areas.

Conwed Enviroblend

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment.
Typical application rates:
2:1 slope, 2500 pounds per acre

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

70% wood fiber, 30% paper fiber
pH 4.8
Moisture holding capacity 1100%

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:3h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Not for use on steep slopes.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Lower cost of materials for areas where slopes are relatively flat.

Contact Information:
Distributor:

Conwed Fibers, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Enviroblend Hydraulic Mulch is a low cost solution for minimizing erosion on any size revegetation project from residential lawns to athletic fields. With its combination of reclaimed, contaminant-free wood and paper fiber, Enviroblend enhances germination by protecting seed from the onslaught of nature'selements.

Erosion Control Products Fact Sheet
Conwed Hydro Mulch 1000

Caltrans
New Technology Report

Description:

Hydromulch.
Wood fiber hydromulch.

Conwed Hydro Mulch 1000

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment.
Typical application rates:
2:1 slope, 2500 pounds per acre

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

99% wood fiber from recovered green wood chips.
pH 4.8
Moisture holding capacity 1200%

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location	***Soil Category***	***Steepness***
Rural	Rocky	> 1:1
Urban	Not rocky	

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.
No tackifier.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Wood fiber length is longer than paper mulch, increasing soil protection from rainfall impact and reducing cupping and lifting associated with paper mulches.

Contact Information:
Distributor:

Conwed Fibers, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

For over 30 years, Hydro Mulch by Conwed Fibers has proven its effectiveness in preventing soil erosion and enhancing seed germination. Independent university studies at the leading water research lab found that Hydro Mulch, which is manufactured from recovered green wood chips, holds soil in place more effectively than 100% paper mulch and discarded waste wood mulch. When mixed with seed and fertilizer, Hydro Mulch forms a homogeneous slurry that ensures an evenly distributed stand of grass.

Erosion Control Products Fact Sheet
Conwed Hydro Mulch 2000

Caltrans
New Technology Report

Description:

Hydromulch.
Wood fiber hydromulch with tackifier.

Conwed Hydro Mulch 2000

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Apply with hydroseed machinery.
Typical application rates:
2:1 slope, 2500 pounds per acre

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

96% wood fiber, 3% guar gum tackifier.
pH 4.8
Moisture holding capacity 1350%

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces.

Contact Information:
Distributor:

Conwed Fibers, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

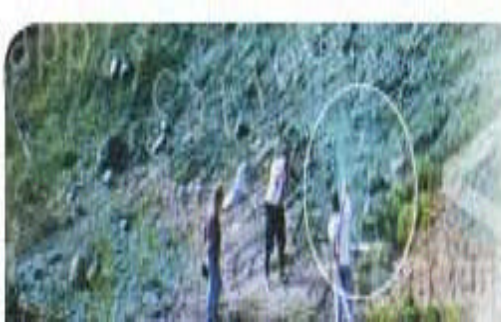
Conwed Hydro Mulch 2000 has proven to be an invaluable tool for contractors and landscapers across the country on critical seeding projects because of its ability to prevent soil erosion and enhance seed germination. When compared to 100% paper mulch and discarded waste wood mulch, Hydro Mulch 2000 is far superior in reducing soil erosion (see comparison chart). The combination of wood fiber mulch and premixed, 100% guar-based organic tackifier is easily applied and establishes an evenly distributed stand of grass.

Erosion Control Products Fact Sheet
Eco-Fibre

Caltrans
New Technology Report

Description:

Hydromulch.
Green colored wood fiber hydromulch.



Eco-Fibre

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Apply EcoFibre evenly to achieve uniform site coverage. Typically 1800 to 2000 lbs./acre (1980 to 2200 kg/ha) needs to be applied, depending on the slope, soil and expected weather conditions. Flat to 3:1 - 1200 - 1500 lbs/acre

When applying EcoFibre, consider wind conditions and nozzle selection before starting. It is preferable to use a fan nozzle as you finish applying the mulch. The application should be from at least two directions to minimize shadowing.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.
Use where slopes are flat to 4:1 and germination conditions are good.

Specifications (Product Data):

Made from whole wood chips.
Technical Specifications:
Moisture Content (wet weight basis).....12 % +/- 3%
Organic Matter (oven dry weight basis).....99.2% +/- 0.2%
Ash Content (oven dry weight basis).....0.8% +/- 0.2%
pH at 3% consistency .....4.5% +/- 0.5%
Moisture holding capacity (grams water/100 grams oven dry fiber) Minimum 1,250

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Wood chip fiber length is longer than recycled newsprint.

Contact Information:
Distributor:

Hydrograss Technologies

Website

http://www.hydrograsstech.com/

Manufacturer:

Canadian Forest Products, Ltd., Fiber Marketing
2806 N.E. Sunset Blvd., Suite A
Renton, WA 98056-3180
800 426-6002

Email

Website

http://www.canforpfd.com/erosion.php?product=ecofibre

Manufacturer's/Distributor's Comments:

EcoFibre is easy to mix and gives great performance with tanks or hoses and provides insurance against vegetation failure and callbacks. EcoFibre covers the same area with 20-30% less product than cellulose mulches due to our premium thermomechanically separated Northern Softwood fibers.

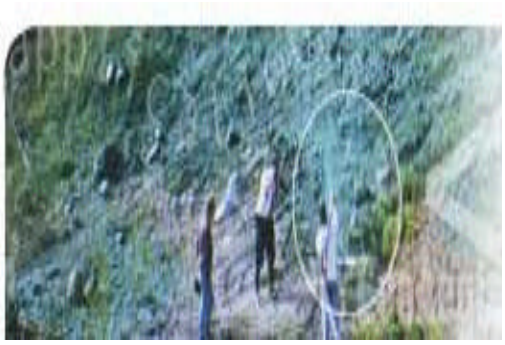
EcoFibre has a non-toxic, green colour added for easy metering and to assist in even application and allow it to blend in with the environment. Even after its initial work of protecting seeds and enhancing germination, EcoFibre keeps on making a difference by decomposing into carbon dioxide, water and organic matter to further aid plant development.

Erosion Control Products Fact Sheet
Eco-Fibre + Tac

Caltrans
New Technology Report

Description:

Hydromulch.
Green colored wood fiber hydromulch with guar tackifier



Eco-Fibre + Tac

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Apply EcoFibre + Tac evenly to achieve uniform site coverage. Typically 1800 to 2500 lbs./acre (1980 to 2750 kg/ha) needs to be applied, depending on the slope, soil and expected weather conditions.

When applying EcoFibre + Tac, consider wind conditions and nozzle selection before starting. It is preferable to use a fan nozzle as you finish applying the mulch. The application should be from at least two directions to minimize shadowing.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Made from whole wood chips and guar gum.
Technical Specifications:
Flat to 3:1 - 1200 - 1500 lbs/acre
Moisture Content (wet weight basis).....10% +/- 3%
Organic Matter (oven dry weight basis)....99.2% +/- 0.2%
Ash Content (oven dry weight basis).....0.8% +/- 0.2%
pH at 3% consistency .....4.5% +/- 0.5%
Tackifier content (based on total weight)..... 3.0%
Moisture holding capacity (grams wter/100 grams oven dry fiber) Minimum 1,250

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Slippery when wet.

Advantages:

Contact Information:
Distributor:

Hydrograss Technologies

Website

http://www.hydrograsstech.com/

Manufacturer:

Canadian Forest Products, Ltd., Fiber Marketing
2806 N.E. Sunset Blvd., Suite A
Renton, WA 98056-3180
800 426-6002

Email

Website

http://www.canforpfd.com/erosion.php?product=ecoaegis

Manufacturer's/Distributor's Comments:

The best mulch available, and then some: EcoFibre + Tac! For extra protection on difficult sites where slopes, soil conditions or weather call for extra erosion control ability. All the advantages of our EcoFibre 100% wood fiber mulch, plus a high strength organic tackifier. Using EcoFibre + Tac ensures a smooth hydroseeding operation. Pre-blended, evenly dispersed, no extra bags. Consistent, high-quality mixture. No irritating tackifier dust clouds. Quick dispersion in water. Blends smoothly with seed and fertilizer. Extra lubricity to the mixture, prevents clogging

Erosion Control Products Fact Sheet
Enviro-Gro

Caltrans
New Technology Report

Description:

Hydromulch.
Cellulose fiber mulch made from recycled newspaper.

Enviro-Gro

Erosion Control Function:

Protects soil from rainfall impact, holds seed in place.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Quantities of mulch and types and quantities of seed and fertilizer formulations are dependent upon a wide variety of situations. Mulch quantities generally range from 750 to 2000 pounds, varying with soil types, weather conditions, and degree of sloped area. The type of seed used is generally determined by climate conditions and seasonal temperatures. Fertilizer formulations are based on generalized soil analysis or by actual soil test reports. Finally, tackifiers may be added to the mix in various amounts of grass cover for lawns and areas where an immediate cover is required.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:

Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

ENVIRO-GRO® meets or exceeds requirements for cellulose wood fiber mulch. ENVIRO-GRO® is a natural cellu lose wood fiber hydraulically applied mulch material manufactured from recycled newspaper and milled into a mulch under a strict quality control. ENVIRO-GRO® is packaged in 50-pound nonslip, tough, weather resistant, 6 mil polyethylene bags. ENVIRO-GRO® fibers are completely free of weed seeds and contains no growth inhibiting foreign matter.

Construction Complexity: Low

Ancillary Facilities:

Apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair or reapply.

Maintenance Level of Effort:

Low

Constraints:

Hydroseeder requires roadway accress and a water source. Recylced paper mulches may dry and"cup" separating the seed from soil contact. Recylced paper mulches have shorter fiber length than wood fiber mulches resulting in less effective protection from rainfall impact.

Advantages:

Using recycled materials has off-site environmental advantages.

Contact Information:
Distributor:

Southwest Environment Services, Inc.
2400 E. Erwin
Tyler, TX 75710
903 531-2211

Website

http://www.southwestenvironment.com/mulch.html

Manufacturer:

Southwest Environment Services, Inc.

Email

Website

Manufacturer's/Distributor's Comments:

ENVIRO-GRO® meets or exceeds requirements for cellulose wood fiber mulch. ENVIRO-GRO® is a natural cellulose wood fiber hydraulically applied mulch material manufactured from recycled newspaper and milled into a mulch under a strict quality control. ENVIRO-GRO® is packaged in 50 pound nonslip, tough, weather resistant, 6 mil polyethylene bags. ENVIRO-GRO® fibers are completely free of weed seeds and contains no growth inhibiting foreign matter. These organic fibers quickly disperse with water, allowing seed and fertilizer to form a homogenous slurry that ensures a uniformly distributed stand of grass. Quantities of mulch and types and quantities of seed and fertilizer formulations are dependent upon a wide variety of situations. Mulch quantities generally range from 750 to 2000 pounds, varying with soil types, weather conditions, and degree of sloped area. The type of seed used is generally determined by climate conditions and seasonal temperatures. Fertilizer formulations are based on generalized soil analysis or by actual soil test reports. Finally, tackifiers may be added to the mix in various amounts of grass cover for lawns and areas where an immediate cover is required.

Erosion Control Products Fact Sheet
Excel Fiber Mulch ll

Caltrans
New Technology Report

Description:

Hydromulch made with aspen wood fiber.

No graphic available

Excel Fiber Mulch ll

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Fiber: Great Lakes Aspen
Fiber length: 50% or more of fiber = to or greater than 0.15 inch (3.81 mm) in length
Weight: 50 lbs (22.7 kg)
Moisture content: 10% +/- 3%
pH: 5.4 +/- 0.1
Organic matter: 99.3% +/- .02
Ash Content: 0.7% +/- .02
Water holding capacity: 1401%

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Wood fiber length is longer than recycled newsprint.

Contact Information:
Distributor:

Website

Manufacturer:

American Excelsior Company
Arlington, TX
800 777-7645

Email

Website

http://www.curlex.com

Manufacturer's/Distributor's Comments:

Excel Fibermulch Provides a high quality mulch for a trouble-free application. It only makes sense that you would trust your hydraulic mulch requirements to a company which has been producing erosion control products for over 30 years. Fibermulch is made from all-natural fibers which are a great nutrient and add organic nourishment to the soil. With its water-activated green dye, it is also pleasing to the eye.

Made from 100% Aspenwood fibers, Excel Fibermulch II is:

Made from all-natural fibers (no blending of unknown outside materials).
Manufactured with a pre-measured amount of premium tackifier for standard applications, which helps provide a protective layer. Our water-activated green dye also aids in the visual application at the project. Wood fibers are a natural nutrient and add organic nourishment to the soil. Free-flowing, which allows for a uniform mix, creating a "blanket" effect to aid in the germination process. Designed to deflect heavy rain and wind.

Erosion Control Products Fact Sheet
Hydro-Spray Mulch

Caltrans
New Technology Report

Description:

Hydromulch.
Recycled newsprint hydromulch.

No graphic available

Hydro-Spray Mulch

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

In all applications, bags of mulch are dispersed into the tank of a hydroseeder filled with water, with the agitation system turned on. We recommend adding one 40-lb. bag of National Fiber mulch per 100 gallons of water to cover 1,500 sq. ft. While this slurry is being agitated, grass seed and fertilizer are added per manufacturer's instructions (usually about 8 lb. grass seed and 3 lb. fertilizer per 100 gal water). This mixture should ideally be conditioned for about 15 minutes before it is ready for spraying. Best results are obtained when the slurry is sprayed directly downward onto the ground.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

100% newsprint
Packed in 40-lb. bags.

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Shorter fiber length than wood products. Paper mulches may dry and "cup" and lift seed off the soil surface.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Made from recycled materials.

Contact Information:

Distributor:

Website

Manufacturer:

National Fiber
50 Depot Street
Belchertown, MA 01007-9619
800 282-7711

Email

Website

http://www.natlfiber.com/

Manufacturer's/Distributor's Comments:

Cellulose hydro-spray mulch has been proven in several third party, university sponsored tests to be at least as effective as virgin wood fiber mulch. In fact, in a Univ. of California (Berkeley) study, the performance of cellulose mulch was rated "excellent," while the performance of wood mulch was rated "good" in the same study. Wood mulch made from recycled construction debris is environmentally friendly, yet it is so contaminated with foreign material that it performs very poorly. Wood mulch made from virgin wood fibers is rated "good" in performance, yet it is an environmentally negative product. In all applications, bags of mulch are dispersed into the tank of a hydro-seeder filled with water, with the agitation system turned on. We recommend adding one 40 lb. bag of National Fiber mulch per 100 gallons of water to cover 1,500 sq. ft. While this slurry is being agitated, grass seed and fertilizer are added per manufacturer's instructions (usually about 8 lb. grass seed and 3 lb. fertilizer per 100 gal water). This mixture should ideally be conditioned for about 15 minutes before it is ready for spraying. Best results are obtained when the slurry is sprayed directly downward onto the ground by an operator walking at the end of a flexible hose with nozzle.
National Fiber's Hydro-Seeding Mulch Products
Our 100% newsprint provides long, inter-locking fibers for excellent ground coverage and outstanding water retention. National Fiber's mulch is packed in 40 lb. bags, which allows safer handling, and quick and easy break-up and dispersion into solution. Our distinctive green color is very pleasing on the ground and is easy to distinguish from grass. National Fiber's paper mulch is ideal for any and every hydro-seeding application. The coverage provided by our mulch can be enhanced with our Earth Bond tackifier, which provides additional locking and adhesion to help keep the mulch in place on slopes and during rainfall. Earth Bond tackifier is packed 5 bottles to the case. One 3 lb. bottle covers one acre.

Erosion Control Products Fact Sheet
Jet-Spray

Caltrans
New Technology Report

Description:

Hydromulch.
Derived from paper & wood.

Jet-Spray

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment.
Application Rates:
Hydroseeding:
Mod to 4:1 Slope 1500 lbs/acre
Greater than 4:1 2000 lbs/acre
Hay & Straw Mulch Binding: 750 lbs/acre
Add 50 lbs of Jet-Spray Fiber per 100 gallons of water when hydroseeding. When fully loaded, allow seed, mulch and fertilizer slurry to mix for 5 minutes prior to seeding.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Correct application per product is critical.

Specifications (Product Data):

Net Weight 40 lbs/bag
Moisture Content 15% max
Wood Fiber Content 20% ±2
Paper Fiber Content 80% ±2
Organic Content 98.4% ±1
Ash Content 1.6% ±1
pH Range 6.7 ±1
Water Holding Capacity 900% min
* H20 holding cap cal 900 Gs / 100 Gs of Fiber

Construction Complexity: Low

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Limited access for specialized equipment.

Advantages:

Meets or exceeds all requirements for wood cellulose fiber mulch. Fiber mulch flake designed to pour into tank openings.
Decreases loading time by 95% in jet-agitated seeders.
Increases fiber to water yield.
Dyed a dark green color for easy metering.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

Designed to improve the performance of jet-agitated hydroseeding machines, Jet-Spray increases the yield of each seeder load and reduces the machine loading time up to 95%.

Erosion Control Products Fact Sheet
Jet-Spray w/ Poly-Fibres

Caltrans
New Technology Report

Description:

Hydromulch.
Paper, wood, and synthetic fibers.

Jet-Spray w/ Poly-Fibres

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment. Fill jet-agitated hydraulic seeder to 1/2 full (min) of water. Add Jet-Spray w/Poly-Fibres, seed, soil amendments and fertilizer as the tank continues to fill.
4 to 1 slope.....1500 lbs / acre
> 4 to 1 slope.....2000 lbs / acre
> 2 to 1 slope.....2500 lbs / acre

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Correct application per product is critical.

Specifications (Product Data):

Moisture content.....12% ± 3
Water holding capacity....850% min
Paper content.....78% ± 2
Wood fiber content.....20% ± 2
Poly-Fibres.....2.0% ± 0.2

Construction Complexity: Low

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Limited access for specialized equipment. No tackifier.

Advantages:

Poly-Fibres enhance the mechanical bond of the fiber mulch matrix
Fiber mulch flakes are designed to pour into tank openings
Dyed a dark green color for easy metering of the applied area
Decreases loading time by 95% in jet agitated hydraulic seeders

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

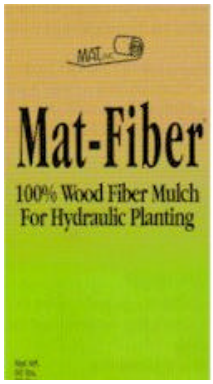
Jet-Spray w/Poly-Fibres is a pourable fiber mulch flake designed to improve the performance of jet-agitated hydroseeding machines, with pre-added Poly-Fibres for increased mechanical bond.

Erosion Control Products Fact Sheet
Mat-Fiber

Caltrans
New Technology Report

Description:

Hydromulch.
Made with whole wood fibers.



Mat-Fiber

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Designed specifically for use in hydraulic planting equipment, Mat-Fiber is made from whole wood fibers, mixed in a large tank with water, seed and fertilizer, and sprayed through a nozzle onto the soil.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

100% Whole Wood Fiber
Moisture content: 12%+/-3%
(total weight basis)
Organic matter: 99.3% min.
(oven-dried weight basis)
Inorganic (ash) content: 0.7%
(oven-dried weight basis, max)
pH at 3% consistency in water slurry: 4.9% (avg.)
Water-holding capacity: 1.2 gal./lb. (min.)

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Wood fiber length is longer than recycled newsprint.

Contact Information:
Distributor:

Website

Manufacturer:

Mat, Inc.
12402 Highway 2
Floodwind, MN 55736
888 477-3028

Email

info@soilguard.com

Website

http://www.soilguard.com/products/matfiber.htm

Manufacturer's/Distributor's Comments:

If you're planting without Mat-Fiber, you might as well throw your seeds to the wind. Wind, rain and dryness can destroy or carry away unprotected seeds before they have a chance to take root. Mat-Fiber mulch helps you beat the elements by giving your seeds the best protection available for growing a solid, healthy lawn or ground cover. How does Mat-Fiber work? Designed specifically for use in hydraulic planting equipment, Mat-Fiber is made from whole wood fibers, mixed in a large tank with water, seed and fertilizer, and sprayed through a nozzle onto the soil Its long fibers interlock and cling to the soil, forming a web-like network that holds the seeds in place. The network then acts like a second layer of soil that deflects wind and rain, and insulates the seed. It retains moisture to sustain the seeds during dry spells. Mat-Fiber decomposes and contributes nutrients to the soil, but only after grass has grown enough to stabilize the soil.

The Mat-Fiber Advantage
Easy application
Mat-Fiber mixes will with the seed, water, fertilizer and optional tackifier in the tank. It sprays quickly for even coverage in a single application, regardless of slope and soil conditions. You need less Mat-Fiber than other mulches to cover the same area. Lower cost. Because of its superior matting ability, Mat-Fiber covers the same area as other mulches, but with fewer pounds. The result is more effective coverage at lower cost. Rapid seed growth Mat-Fiber's mix of fiber size provides excellent water absorption. It's strong mat holds moisture and promotes rapid seed growth for quick, quality results. Only whole wood is used to make Mat-Fiber. No weed seeds or germination-inhibiting chemicals are introduced during manufacturing, so you get a weed-free lawn with a great layer of protection for your germinating grass.

Erosion Control Products Fact Sheet
Re-Fiber Mix w/ TAC

Caltrans
New Technology Report

Description:

Hydromulch.
Wood fiber, newsprint, and tackifier hydromulch.

No graphic available

Re-Fiber Mix w/ TAC

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Moisture content (total weight basis): 12%+/-3%
pH (average): 5.4
Organic Content (minimum): 96%
Inorganic (ash) Content (maximum): 1%
Water Holding Capacity (minimum): 1 gal./lb.
Wood Fiber (+/-5%): 67.9%
Recycled Newsprint (+/-5%): 29.1%
Tackifier (minimum): 3%
Bag Net Weight
50 lb./22.6kg

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces.

Contact Information:
Distributor:

KPA Enviro Green International
15912 73rd Ave. S.E.
Snohomish,, WA 98290
425 485-6091

Website

http://www.infron.nl/Terra/magic/terrapy/bio/golf/body_mulchtop.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Re-Fiber™ Mix w/Tac is 67.9% wood fiber blended with 29.1% clean recycled newsprint with an added 3% (minimum) tackifier that provides you with all the benefits of wood and paper fiber, combined with a viscous polymer tackifier. This product also contains an acrylic co-polymer gel to enhance the water-holding capacity of the fiber mulch matrix. Re-Fiber Mix w/Tac combines value, performance, and consistency in manufacturing. Recommended for plantings where wind and water erosion protection is needed.

Erosion Control Products Fact Sheet
Re-Fiber Wood

Caltrans
New Technology Report

Description:

Hydromulch.
Wood fiber hydromulch.

No graphic available

Re-Fiber Wood

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

100% wood fiber (see Re-Fiber Wood with TAC)
Moisture Content (total weight basis): 12+-3%
ph (average): 5.4
Organic Content: 99%
Inorganic (ash) Content (maximum): 1%
Water Holding Capacity: 1 gal / lb
Bag Net Weight: 50 lb. (22.6 kg)

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. No tackifier

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces.

Contact Information:
Distributor:

KPA Enviro Green International
15912 73rd Ave. S.E.
Snohomish,, WA 98290
425 485-6091

Website

http://www.infron.nl/Terra/magic/terrapy/bio/golf/body_mulchtop.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

100% wood fiber mulch offers the advantages of improved germination and erosion protection. An ideal blend of long, medium, and short fibers, Re-Fiber Wood loads and mixes easily. Water retained by the fibers is transferred into the root zone, allowing for more uniform coverage and germination of the seed bed. Re-Fiber wood combines value and performance and is created in harmony with today's environmental concerns. Premium quality and suitable for all hydraulic applications including, but not limited to, Landscape Plantings, Roadsides, Wildflowers and Natives, Re-Vegetation, Reclamation, Golf Construction, Erosion Control, Renovation, and Dust Control.

Erosion Control Products Fact Sheet
Re-Fiber Wood w/TAC

Caltrans
New Technology Report

Description:

Hydromulch.
Wood fiber hydromulch with tackifier.

No graphic available

Re-Fiber Wood w/TAC

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment
Suggested application rate on 2:1 slope (minimum) 1500 lbs. per acre, greater than 2:1 - 2000 lbs

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Moisture content (total weight basis): 12%+/-3%
pH (average): 5.4
Organic Content (minimum): 96%
Inorganic (ash) Content (maximum): 1%
Water Holding Capacity (minimum): 1 gal./lb.
Bag Net Weight: 50 lb./22.6kg

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces.

Contact Information:
Distributor:

KPA Enviro Green International
15912 73rd Ave. S.E.
Snohomish,, WA 98290
425 485-6091

Website

http://www.infron.nl/Terra/magic/terrapy/bio/golf/body_mulchtop.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Re-Fiber Wood w/Tac is 97% wood fiber blended with an added 3% (minimum) tackifier. This provides the benefit of wood fiber and higher surface tension derived from a polymer tackifier. Re-Fiber Wood w/Tac also contains an acrylic co-polymer gel to enhance water holding capacity of the fiber mulch matrix, which further improves germination and coverage. Re-Fiber Wood w/Tac combines value, consistency, and high performance in the tank through the hose and on the ground. It is a pleasure to mix and spray.

Erosion Control Products Fact Sheet
Second Nature Paper Fiber Mulch

Caltrans
New Technology Report

Description:

Hydromulch.
Paper fiber hydromulch.

Second Nature Paper Fiber Mulch

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Physical Properties

Recycled paper content (max.)..... 90%
Moisture content.....12% (+/-3%)
pH @ 25C.....(10g/200ml) 6.5 (+/-1)
Toxicity.....non-toxic
Water holding capacity.....1.2 gal. Per lb.
Applied color.....green

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment. Shorter fiber length than wood products. Paper mulches may dry and "cup" and lift seed off the soil surface.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Uses non-toxic recycled materials.

Contact Information:
Distributor:

Website

Manufacturer:

Central Fiber Corporation
4814 Fiber Lane
Wellsville, Kansas
800 654-6117

Email

mailto:sales@centralfiber.com

Website

http://www.centralfiber.com/

Manufacturer's/Distributor's Comments:

Economical and ecological.

Second Nature® Paper Fiber Mulch is manufactured from premium recycled paper fibers that decompose into the ground, accelerating the growth process. Second Nature® Paper Fiber Mulch is non-toxic and biodegradable. As the new product decomposes, it adds nutrients to the soil that help support the
growth of new vegetation. The mulch absorbs and retains precious moisture. Water is captured and slowly released to the seed creating a better environment for germination. Erosion is minimized providing better overall results.

Easy to handle and apply.
Second Nature® mulches are packaged in 50-pound bags and shipped in a convenient one-ton pallet that is unique to the industry. This configuration allows for easy handling in the field and space savings at the warehouse. Second Nature® mixes in about 10 minutes in the hydroseeding tank. The slurry sprays
consistently and equipment cleans up quickly with water. Second Nature®'s rich green color, superior wetability, and consistent performance make it the obvious choice for the hydroseeding professional

Erosion Control Products Fact Sheet
Wood Cellulose Fiber

Caltrans
New Technology Report

Description:

Hydromulch.
Newsprint and wood fiber hydromulch blend.

Wood Cellulose Fiber

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:

High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

Moisture content.....12% ± 3
Organic content.....98.4% ± 2.0
Ash content.....1.6% ± 2.0
pH range.....5.5 ± 1.0
Water holding capacity.....950% min
Fiber mulch viscosity.....1.55 cps ± 0.10
Wood fiber.....20%
Newsprint.....80%

Location	*Soil Category*	*Steepness*
Rural	Rocky	Max. 1v:2h
Urban	Not rocky	

Caltrans BMP ID	*SWMP Category*
SS-3	IB: Permanent II: Temporary

Caltrans Slope Type	*Status*
Cut Fill	Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment. After filling hydraulic seeder with water add Wood Cellulose Fiber and any other amendments.
Typical Application Rate
3 to 1 slope.....1500 lbs / acre

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces. Enhanced erosion protection compared to recycled newsprint alone.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

20% wood fiber blended with 80% recycled newsprint offers distinct advantages. Enhanced coverage and erosion resistance is derived from the addition of the wood fiber, while improved machine performance and higher loading rates are derived from recycled paper. Wood Cellulose is our best combined fiber value, suitable for fine turf lawns and all general purpose plantings.

Erosion Control Products Fact Sheet
Wood Cellulose w/Poly-Fibres

Caltrans
New Technology Report

Description:

Hydromulch.
Paper and wood fiber mulch with synthetic fibers. No tackifier.

No graphic available

Wood Cellulose w/Poly-Fibres

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment.
Application rate: 2.5 to 1 slope 1500 lbs / acre

After filling hydraulic seeder with water add seed, soil amendments, Wood Cellulose w/Tacking Agent III.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Moisture content.....12% ± 3
Organic content.....96.4% ± 1
Wood chips.....20% ± 5
Newsprint.....78% ± 5
Poly-Fibres.....2.0% ± 0.1
Water holding capacity....1200% min
Fiber mulch viscosity.....2.29 cps ± 0.10

Construction Complexity: Low

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Limited access for specialized equipment. No tackifier.

Advantages:

Poly-Fibres increase the water holding capacity and the mechanical bond of the fiber mulch matrix.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

Our combination paper and wood fiber mulch with Poly-Fibres. This product contains 2% Poly-Fibres by weight of fiber mulch. Poly-Fibres increase the water-holding capacity and the mechanical bond of the fiber mulch matrix.

Erosion Control Products Fact Sheet
Wood Cellulose w/Tack III

Caltrans
New Technology Report

Description:

Hydromulch.
Paper and wood fiber hydromulch with tackifier.

No graphic available

Wood Cellulose w/Tack III

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment.
Application rate: 2 to 1 slope 1500 lbs / acre

After filling hydraulic seeder with water, add seed, soil amendments, and Wood Cellulose w/Tacking Agent III.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Application rate is critical to effectiveness.

Specifications (Product Data):

1. Materials: Cellulose fiber, clean raw lumber wood chips, polymer tackifier, dark green dye.
2. pH Range: 6.7 plus or minus 1.
3. Moisture Content: 12+-3% percent maximum.
4. Wood Fiber Content: 20 percent plus or minus 5 percent.
5. Paper Fiber Content: 77 percent plus or minus 5 percent.
6. Polymer Tackifier: 3+-.2% Tacking Agent 3 (University-tested to control erosion without having to cure, effective immediately after hydro-seeding).
7. Organic Content: 95.4 percent plus or minus 1 percent.
8. Ash Content: 4.6 percent plus or minus 1 percent.
9. Water Holding Capacity: 1150 percent minimum.

Construction Complexity: Medium

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location	Soil Category	Steepness
Rural	Rocky	Max. 1v:2h
Urban	Not rocky	

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Limited access for specialized equipment.

Advantages:

Rapid deployment for temporary soil stabilization on uneven surfaces.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

New in 1999, our combination paper and wood fiber mulch with our famous tackifier contains 3% Tacking Agent III by weight of fiber mulch.

Erosion Control Products Fact Sheet
Wood Cellulose with Tack III & Poly-Fibres

Caltrans
New Technology Report

Description:

Hydromulch.
Paper and wood fiber mulch with tackifier and synthetic fibers.

No graphic available

Wood Cellulose with Tack III & Poly-Fibres

Erosion Control Function:

Hydromulch protects soil from rain impact erosion and maintains cover for seed.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Concentrated water flow must be diverted away from treatment site. Spray on hydromulch with specialized equipment. After filling hydraulic seeder with water add seed, soil amendments, Wood Cellulose w/Tacking Agent III & Poly-Fibres and fertilizer. 2 to 1 slope 1500 lbs / acre

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Moisture content.....12% ± 3
Wood chips..... 20% ± 5
Newsprint.....75% ± 5
Poly-Fibres.....2.0% ± 0.1
Tacking Agent III.....3.0% ± 0.2
Water holding capacity..1350% min
Fiber mulch viscosity...2.53 cps ± 0.10

Construction Complexity: Low

Ancillary Facilities:

Location may require additional equipment/staging areas for hydromulch applicator.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair or reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Limited access for specialized equipment.

Advantages:

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com/

Manufacturer:

Email

Website

http://www.terra-mulch.com

Manufacturer's/Distributor's Comments:

New in 1999, our highest quality paper and wood fiber mulch with 3% added Tacking Agent III and 2% added Poly-Fibres. Perfectly mixed in the package, it loads easily in all types of hydraulic seeders.

Erosion Control Products Fact Sheet
APS 700 Series Silt Stop

Caltrans
New Technology Report

Description:

Flocculator.
Polyacrylamide copolymer powder settles silt from water.

APS 700 Series Silt Stop

Erosion Control Function:

Agent that precipitates sediment from surface water.

Caltrans BMP ID
None

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Applied with a hand spreader, mechanical disc or can be mixed with water and applied with a spraying device at a rate of approximately 10 pounds per acre.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Water may require additional filtration to remove product.

Specifications (Product Data):

A soil specific tailored polyacrylamide copolymer powder for erosion control.

Construction Complexity: Low

Ancillary Facilities:

Additional filtering my be required for flocculant.

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent filter check during rainy season.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Chemicals may need to be removed after installation.

Advantages:

Binds sediment to slope.

Contact Information:
Distributor:

Hydrograss Technologies
157 Southbridge Rd
N Oxford, MA 01537
800 853-5393

Website

http://www.hydrograsstech.com/cleansing.html#700

Manufacturer:

Email

Email: bob@hydrograsstech.com

Website

Manufacturer's/Distributor's Comments:

APS 700 Series Silt Stop®
Polyacrylamide Erosion Control Powder
A soil specific tailored polyacrylamide copolymer powder for erosion control. Used to reduce and prevent erosion of fine particles. Settles our suspended particles of sediment and colloidal clays from water. Applied with a hand spreader, mechanical disc or can be mixed with water and applied with a spraying device at a rate of approximately 10 pounds per acre.

Erosion Control Products Fact Sheet
APS Floc Log

Caltrans
New Technology Report

Description:

Flocculator.
Polyacrylamide copolymer block that settles silt from water.

APS Floc Log

Erosion Control Function:

Agent that precipitates sediment from surface water.

Caltrans BMP ID
SC-10

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Floc Logs are staked in place in a location close to active earth moving activities and can also be used in drop inlets, storm drains, retrofits and slope drains. The APS Floc Log will treat a flow rate of 60 to 75 gallons per minute.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Water may require addit ional filtration to remove product.

Specifications (Product Data):

Polyacrylamide copolymer.
A soil and water chemistry tailored gel block.

Construction Complexity: Low

Ancillary Facilities:

Additional filtering my be required for flocculant. Used in conjunction with other storm drain inlet protection devices.

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent filter check during rainy season.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Chemicals may need to be removed after installation.
Requires frequent inspection and sediment removal.

Advantages:

Precipitates sediment to improve filtering capacity of storm drain inlet protection devices.

Contact Information:
Distributor:

Hydrograss Technologies
157 Southbridge Rd
N Oxford, MA 01537
800 853-5393

Website

http://www.hydrograsstech.com/cleansing.html#700

Manufacturer:

Email

Email: bob@hydrograsstech.com

Website

Manufacturer's/Distributor's Comments:

APS Floc Log®
Polyacrylamide Semi-hydrated Gel Block soil and water chemistry tailored gel block, that when placed within stormwater or construction site damages will remove fine colloidal particles and reduce NTU values. Floc Logs are staked in place in a location close to active earth moving activities and can also be used in drop inlets, storm drains, retrofits and slope drains. The APS Floc Log will treat a flow rate of 60 to 75 gallons per minute.

Erosion Control Products Fact Sheet
3DTRM-CC

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Coconut fiber sandwiched between plastic geogrids.

3DTRM-CC

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. Primarily used in channels.

Effectiveness:

High

Confidence Level of Effectiveness Rating:

High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Thickness: ASTM D-1777 0.50 in (12.7 mm)
Weight: ASTM D-5261 13 oz/sy (440 g/m2)
Ground Cover Light Projection: 87%
Ultraviolet Stability: ASTM D-4355 97%
Tensile Strength:
ASTM D-5035 720 x 780 lb/ft 10.5 x 11.4 kN/m
Tensile Strength: (at 10% elongation)
ASTM D-5035 528 x 552 lb/ft 7.7 x 8.1 kN/m
Tensile Elongation: (ultimate) 10% (min), 20% (max)
Recommended Velocity: 20 ft/sec (6.1 m/sec)
Recommended Shear Stress: 8 lb/ft2 (0.385 kN/m2)
Standard Roll Size: 6.56'x 83' (60 sy) 2.0 m x 25 (50 sq. m)

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.
Staple Pattern:
> 1:1 slopes 3.0' x 2.0'
2:1 slopes 4.0' x 2.0'
3:1 slopes 6.0' x 3.0'
4:1 slopes 8.0' x 3.0'

Construction Complexity: Low

Ancillary Facilities:

Pin length may need to be increased due to saturated soil.

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

RoLanka
800 760-3215

Email

Website
http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

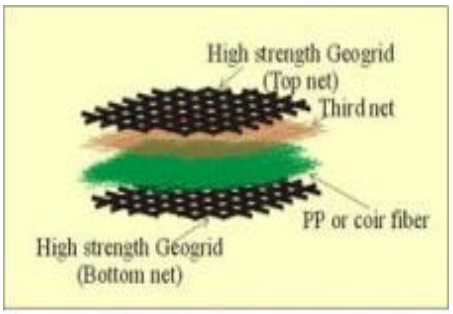
Complete erosion protection since day-one after installation. Much better and less expensive permanent protection compared to rock riprap and concrete. 3DTRM-CC is constructed like RoLanka's 3DTRM-PP mat only the green synthetic fiber is replaced with brown coconut fiber. The 3DTRM-CC design provides higher tensile strength with low elongation. This low elongation property in the RoLanka TRMs is a major improvement in permanent TRMs and makes the 3DTRM-CC a superior value over other currently available TRMs.

In field applications, elongation levels at or above 10% can result in shearing of plant stems from roots and irreversible damage toTRM as well as to the plant-TRM composite. The high tensile strength and low elongation in 3DTRM-CC combined with three-net-structure provide high shear stress resistance without extensive stretching in the TRM structure when subjected to design flow conditions. The 3DTRM-PP and 3DTRM-CC TRMs are excellent, flexible and economical permanent channel liners to create vegetated waterways compared to rock rip-rap or concrete lined channels. Low elongation and high tensile strength in the 3DTRM-PP and 3DTRM-CC TRMs also make it suitable to use in fabric encapsulated soil layer constructions and slope reconstructions. In these applications, 3DTRM-PP and 3DTRM-CC not only provide permanent stability in the constructions but also allow to use steeper slope angles.

Erosion Control Products Fact Sheet
3DTRMPP

Caltrans
New Technology Report

Description:
Turf reinforcement mat (TRM).
Synthetic turf reinforcement mat.



Improved Turf Reinforcement Technology

3DTRMPP

Erosion Control Function:
Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. Primarily used as a channel liner.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:
Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.
Staple Pattern:
> 1:1 slopes 3.0' x 2.0'
2:1 slopes 4.0' x 2.0'
3:1 slopes 6.0' x 3.0'
4:1 slopes 8.0' x 3.0'

Effectiveness:
High

Confidence Level of Effectiveness Rating:
High

Notes:
Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):
Thickness: ASTM D-1777 0.50 in (12.7 mm)
Weight: ASTM D-5261 13 oz/sy (440 g/m2)
Ground Cover Light Projection: 87%
Ultraviolet Stability: ASTM D-4355 97%
Tensile Strengt:h
ASTM D-5035 720 x 780 lb/ft 10.5 x 11.4 kN/m
Tensile Strength (at 10% elongation):
ASTM D-5035 528 x 552 lb/ft 7.7 x 8.1 kN/m
Tensile Elongation: (ultimate) 10% (min), 20% (max)
Recommended Velocity: 20 ft/sec (6.1 m/sec)
Recommended Shear Stress: 8 lb/ft2 (0.385 kN/m2)
Standard Roll Size: 6.56'x 83' (60 sy) 2.0 m x 25 (50 sq. m)

Construction Complexity: Low

Ancillary Facilities:
Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation. High tensile strength with low elongation.

Contact Information:
Distributor:

Website

Manufacturer:

RoLanka
800 760-3215

Email

Website
http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

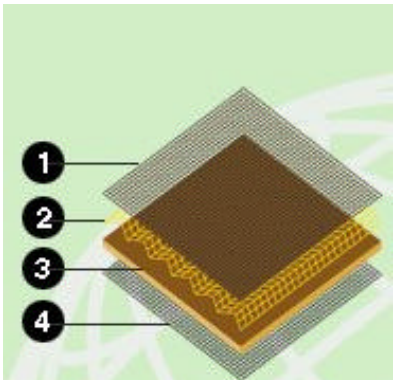
Complete erosion protection since day-one after installation. Much better and less expensive permanent protection compared to rock riprap and concrete, RoLanka's 3DTRM-PP mat is constructed of green color polypropylene (PP) fiber layer sewn between two high strength polypropylene (PP) grids and reinforced with a standard PP net. The third net in the 3DTRM-PP enhances its performance over conventional two-net TRMs by more securely holding fibers in place during heavy flow conditions. Structural integrity of the TRM is assured by strong parallel stitching with polyolefin thread.
The 3DTRM-PP and 3DTRM-CC design provides higher tensile strength with low elongation. This low elongation property in the RoLanka TRMs is a major improvement in permanent TRMs and makes the 3DTRM-PP and 3DTRM-CC a superior value over other currently available TRMs.
In field applications, elongation levels at or above 10% can result in shearing of plant stems from roots and irreversible damage toTRM as well as to the plant-TRM composite. The high tensile strength and low elongation in 3DTRM-PP and 3DTRM-CC combined with three-net-structure provide high shear stress resistance without extensive stretching in the TRM structure when subjected to design flow conditions. The 3DTRM-PP and 3DTRM-CC TRMs are excellent, flexible and economical permanent channel liners to create vegetated waterways compared to rock rip-rap or concrete lined channels. Low elongation and high tensile strength in the 3DTRM-PP and 3DTRM-CC TRMs also make it suitable to use in fabric encapsulated soil layer constructions and slope reconstructions. In these applications, 3DTRM-PP and 3DTRM-CC not only provide permanent stability in the constructions but also allow to use steeper slope angles. GEORGIA DOT has approved the 3DTRM-PP TRM as a permanent channel liner.

Erosion Control Products Fact Sheet
C350 Composite Turf Reinforcement Mat

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
High-strength, three-dimensional UV stabilized triple netting structure with a long-lasting 100% coconut fiber matrix.



C350 Composite Turf Reinforcement Mat

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. Primarily used in channels.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions and install as shown on drawings. It may be necessary to smooth the ground prior to blanket installation in order to assure better soil/blanket contact. Broadcast seed before blanket is installed or mix seed with topsoil and broadcast a thin layer on top.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Top net: 24 lbs/1000 sq ft Black Polypropylene
Center Netting: 24 /bs/1000 sq ft black polypropylene-corrugated
Matrix material: 100% polypropylene
Bottom Net: 24 lbs/1000 sq ft black polypropylene

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Soil surface must be smooth before installation.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:

Distributor:

Website

Manufacturer:

North American Green
14649 Highway 41 North
Evansville , IN 47725
800 772-2040

Email

Website

http://www.nagreen.com/

Manufacturer's/Distributor's Comments:

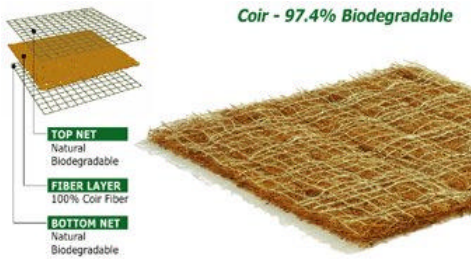
C350, the original Composite Turf Reinforcement mat, unites the power of a super high-strength three-dimensional UV stabilized triple netting structure with a long-lasting 100% coconut fiber matrix.
The result? Your super steep slopes and high flow channels get a higher level of immediate erosion protection and permanent vegetation reinforcement. C350's coconut fiber matrix sustains its high performance immediate erosion protection qualities for up to 36 months. Additionally, C350's powerful permanent three-dimensional structure empowers vegetation to resist shear stresses up to eight pounds per square foot. That means you can plan for beautiful green channels instead of 24-inch rock riprap for your next big project!

Erosion Control Products Fact Sheet
CF072B Dbl. Organic Net Coconut

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
100% coir turf reinforcement mat with natural fiber netting. To be used on slopes of 1:1 or greater and channels. Rated temporary and long term biodegradable. Functional longevity of 24 months.



CF072B Dbl. Organic Net Coconut

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions and install as shown on drawings. It may be necessary to smooth the ground prior to blanket installation in order to assure better soil/blanket contact.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Fiber: Coir
Fiber Content: 100%
Width (Feet/Meters): 8/2.4
Length (Feet/Meters): 67.5/20.5
Area (Square Yards/Square Meters): 60/50
Weight (Lbs Sq. Yd./Kg/Sq.Meters): .7/.379
Weight per Blanket (Pounds/Kilograms): 42/19
Functional Longevity (Months): 24
Top Net Type (Biodegradable): Natural
Bottom Netting Type (Biodegradable): Natural

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation. No plastic.

Contact Information:
Distributor:

Telfer Geosynthetics
1150 Willow Pass Rd
Pittsburg, CA
800 956-9999

Website

Manufacturer:

Greenfix America
PO Box 1620
Calipatria, CA
760 348-7600

Email

sales@greenfix.com

Website

http://www.greenfix.com

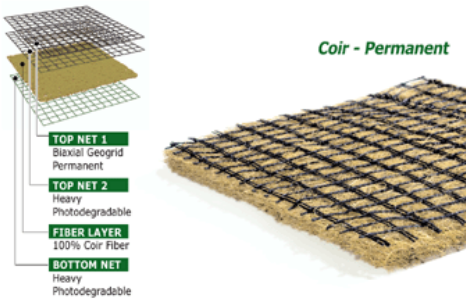
Manufacturer's/Distributor's Comments:

Erosion Control Products Fact Sheet
CFG2000 Geogrid Reinforced Coconut TRM

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Coir turf reinforcement mat with plastic netting on top and bottom.Categorized for permanent control. To be used on slopes of 1:1 or greater and channels. Rated temporary biodegradable. Functional longevity of 36+ months.



CFG2000 Geogrid Reinforced Coconut TRM

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions and install as shown on drawings. It may be necessary to smooth the ground prior to blanket installation in order to assure better soil/blanket contact.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Fiber: Coir
Fiber Content: 100%
Width (Feet/Meters): 7.5/2.3
Length (Feet/Meters): 72/21.9
Area (Square Yards/Square Meters): 60/50
Weight (Lbs Sq. Yd./Kg/Sq.Meters): .95/.514
Weight per Blanket (Pounds/Kilograms): 57/25.9
Functional Longevity (Months): 36+
Top Net Type 1 (Permanent): Bixaxial Geogrid
Type 2 (Photodegradable): Heavy
Bottom Netting Type (Photodegradable): Heavy

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location	Soil Category	Steepness
Rural	Not rocky	> 1:1
Urban		

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Telfer Geosynthetics
1150 Willow Pass Rd
Pittsburg, CA
800 956-9999

Website

Manufacturer:

Greenfix America
PO Box 1620
Calipatria, CA
760 348-7600

Email

sales@greenfix.com

Website

http://www.greenfix.com

Manufacturer's/Distributor's Comments:

Erosion Control Products Fact Sheet
CT-4 Woven Coir Twine Geotextile

Caltrans
New Technology Report

Description:

Turf Reinforcement Mat (TRM).
Three-dimensional coir mat, 460g/m2
This product is made of higher tensile strength coir yarns than most RECPs, wound into a high-strength twine then woven into a mat.

CT-4 Woven Coir Twine Geotextile

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in channels. Absorbs energy of rainfall.

Caltrans BMP ID
SS-7

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth the slope surface and broadcast seed prior to installation of product. Pin or staple in place. Some applications will require topsoil and seed brushed into the product after product installation.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Weight/sqm: 460g
Tensile strength: dry 59/54 lbs, wet 38/40 lbs
Elongation at Failure: dry 38/29%, wet 33/30%
Open area: 1 inch
Physical specification of the roll
Width: 1 meter - 4 meter
Length: 0.6 meter - 50 meter

Construction Complexity: Low

Ancillary Facilities:

Tractor may be needed to lift longer length rolls.
Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Soil surface must be smooth before installation.

Advantages:

Contact Information:

Distributor:

Website

Manufacturer:

ExcelFiber (a division of ExcelHigh, Inc.)
350 5th Ave Suite 700A
New York, NY 10001
212 947-8543

Email

Website

http://www.excelhigh.com

Manufacturer's/Distributor's Comments:

This woven geotextiles are made to matrix by running the yarns in warp and weft direction forming open mesh matrix. The open area will vary according to the number of warp and weft yarn running in a specified area.

Coir Twine Geotextiles -due to its high tensile strength and functional longevity of 5-7 years, these mats can be used in very steep slopes and in channels and ditches with shear stresses up to 5 lbs./sq. ft(240n/m2). This type of blanket, which is referred to as turf reinforcement mat (trm), is an ideal substitute for 100% synthetic blankets.

Erosion Control Products Fact Sheet
CT-7 Woven Coir Twine Geotextile

Caltrans
New Technology Report

Description:

Turf Reinforcement Mat (TRM).
Three-dimensional coir mat, 780g/m2.
This product is made of higher tensile strength coir yarns than most RECPs, wound into a high-strength twine then woven into a mat.

CT-7 Woven Coir Twine Geotextile

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in channels. Absorbs energy of rainfall.

Caltrans BMP ID
SS-7

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth the slope surface and broadcast seed prior to installation of product. Pin or staple in place. Some applications will require topsoil and seed brushed into the product after product installation.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Weight/sqm: 780g
Tensile strength: dry 120/95 lbs, wet 100/80 lbs
Elongation at Failure: dry 41/34%, wet 43/37 %
Open area: 3/4 inch
Physical specification of the roll
Width: 1 meter - 4 meter
Length: 0.6 meter - 50 meter

Construction Complexity: Low

Ancillary Facilities:

Tractor may be needed to lift longer length rolls.
Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Soil surface must be smooth before installation.

Advantages:

Contact Information:

Distributor:

Website

Manufacturer:

ExcelFiber (a division of ExcelHigh, Inc.)
350 5th Ave Suite 700a
New York, NY 10001
212 947-8543

Email

Website

http://www.excelhigh.com

Manufacturer's/Distributor's Comments:

This woven geotextiles are made to matrix by running the yarns in warp and weft direction forming open mesh matrix. The open area will vary according to the number of warp and weft yarn running in a specified area.

Coir Twine Geotextiles -due to its high tensile strength and functional longevity of 5-7 years, these mats can be used in very steep slopes and in channels and ditches with shear stresses up to 5 lbs./sq. ft(240n/m2). This type of blanket, which is referred to as turf reinforcement mat (trm), is an ideal substitute for 100% synthetic blankets.

Erosion Control Products Fact Sheet
CT-9 Woven Coir Twine Geotextile

Caltrans
New Technology Report

Description:

Turf Reinforcement Mat (TRM).
Three-dimensional coir mat, 980g/m2
This product is made of higher tensile strength coir yarns than some other coir products, wound into a high-strength twine, then woven into a mat.

CT-9 Woven Coir Twine Geotextile

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in channels. Absorbs energy of rainfall.

Caltrans BMP ID
SS-7

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth the slope surface and broadcast seed prior to installation of product. Pin or staple in place. Some applications will require topsoil and seed brushed into the product after product installation.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Weight/sqm: 980g
Tensile strength: dry 159/95 lbs, wet 138/79lbs
Elongation at Failure: dry- 33/34%, wet 40/40%
Open area: 1/2 inch
Physical specification of the roll
Width: 1 meter - 4 meter
Length: 0.6 meter - 50 meter

Construction Complexity: Low

Ancillary Facilities:

Tractor may be needed to lift longer length rolls.
Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Soil surface must be smooth before installation.

Advantages:

Contact Information:

Distributor:

Website

Manufacturer:

ExcelFiber (a division of ExcelHigh, Inc.)
350 5th Ave Suite 700a
New York, NY 10001
212 947-8543

Email

Website

http://www.excelhigh.com

Manufacturer's/Distributor's Comments:

This woven geotextiles are made to matrix by running the yarns in warp and weft direction forming open mesh matrix. The open area will vary according to the number of warp and weft yarn running in a specified area.

Coir Twine Geotextiles -due to its high tensile strength and functional longevity of 5-7 years, these mats can be used in very steep slopes and in channels and ditches with shear stresses up to 5 lbs./sq. ft(240n/m2). This type of blanket, which is referred to as turf reinforcement mat (trm), is an ideal substitute for 100% synthetic blankets.

Erosion Control Products Fact Sheet
ECS Earth-Lock

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Wood fiber mat with synthetic netting on both sides.

No graphic available

ECS Earth-Lock

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Effectiveness:

High

Confidence Level of Effectiveness Rating:

High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

3020-02 Earth-Lock 3/4" (1.9cm) photodegradable netting stitched on 3" (7.6cm) centers on both sides. Excelsior mulch in the middle.
Width: 6.35' (1.9m)
Length: Approximately 120' (36.6m)
Weight: 103 lbs/roll +/- 10% (46.7 kilograms)
Area: 84 Sq Yds (70.2 sq m)
Packaging: Vented Plastic Bag - Black

Location	Soil Category	Steepness
Rural	Not rocky	Max. 1v:1h
Urban		

Caltrans BMP ID	SWMP Category
SS-7	IB: Permanent

Caltrans Slope Type	Status
Cut	Approved Case by Case
Fill	

Installation/Application:

Erosion Control Systems Installation Instructions:
Smooth surface area first.
Slope Application: Overlay the sides snugly together (overlapping max 2") if possible extend 3-1/2 feet over the crest.
Ditch Line Application: Roll out mat with the flow. Overlap the ends by 3" in the flow direction and anchor with a common row of staples not more than 1-1/2 feet apart. On wide ditches, overlapping of mat joints should not be in center of ditch.

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Southwest Environment Services, Inc.
2400 E. Erwin
Tyler, TX 75710
903 531-2211

Website

http://www.southwestenvironment.com/mulch.html

Manufacturer:

Southwest Environment Services, Inc.

Email

Website

Manufacturer's/Distributor's Comments:

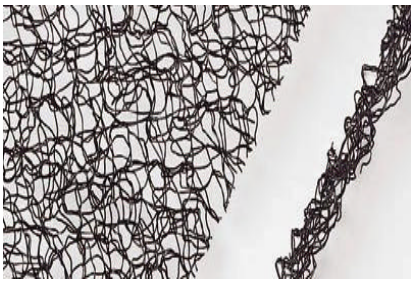
Purpose:
To protect slopes, embankments, berms, ditches and dams and emergency spillways until vegetation is established as well as giving root support. Earth-Lock is a composite of biodegradeable wood excelsior mulch and continuous synthetic filament geomatrix stitched on 3" centers to a heavy reinforced netting. This innovation offers the engineer, contractor and owner, the assurance of a good vegetative mulch for fast growth as well as root support. This wide mat meets the needs for projects that require more than a revegetation mulch blanket. Earth-Lock is an economical product design for permanency and performance.
Permanency:
Moderate to severe conditions require a permanent reinforcing nylon geomatrix which will be long term protection. The Earth-Lock blanket provides mulching and permanent erosion control through its high impact excelsior fill, reinforced by a synthetic geomatrix system, which continues to stabilize and hold the root structure.

Erosion Control Products Fact Sheet
Enkamat 7000 Series

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic turf reinforcement mat made from nylon monofilaments fused at their intersections.



Enkamat 7000 Series

Erosion Control Function:

Three dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. Used in the steepest of slopes and in moderate to high-velocity channels. Typical applications include embankments, ditches and spillways.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Weight:271 to 407 g/m2
Enkamat is a three-dimensional nylon matrix joined at the intersections. 95% of the geomatrix is open space, which supplements nature's own erosion control system by reinforcing the plant roots. As the roots grow, they become entwined within the Enkamat, making an extremely stable cover. Its tough root-reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high-volume discharges. Enkamat can withstand velocities greater than 20 feet per second and has no buoyancy factor (specific gravity > 1).

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location	Soil Category	Steepness
Rural	Not rocky	> 1:1
Urban		

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Colbund Geosynthetics
P.O. Box 1057, Sand Hill Rd
Enka, NC 28728
800 365-7391

Email

info@colbund-usa.com

Website

http://www.colbond-usa.com/civileng.htm

Manufacturer's/Distributor's Comments:

The cornerstone of the Enkamat product line, these original versions were introduced to the industry more than 25 years ago.
They are used in the steepest of slopes and in moderate to high-velocity channels. Typical applications include embankments, ditches and spillways.

Erosion Control Products Fact Sheet
Enkamat 7200 Series

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic turf reinforcement mats have a two-dimensional nylon layer on the bottom of the matting to form a more closed "flat" structure on the underside compared to the 7000 series. They are commonly used in regions with highly erosive silts or sandy soils and act as a form to hold a variety of fill materials.

Enkamat 7200 Series

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. They are commonly used in regions with highly erosive silts or sandy soils and act as a form to hold a variety of fill materials.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Weight: 261 to 400 g/m2
Enkamat is a three-dimensional nylon matrix joined at the intersections. 95% of the geomatrix is open space, which supplements nature's own erosion control system by reinforcing the plant roots. As the roots grow, they become entwined within the Enkamat, making an extremely stable cover. Its tough root-reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high-volume discharges. Enkamat can withstand velocities greater than 20 feet per second and has no buoyancy factor (specific gravity > 1).

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Colbund Geosynthetics
P.O. Box 1057, Sand Hill Rd
Enka, NC 28728
800 365-7391

Email

info@colbund-usa.com

Website

http://www.colbond-usa.com/civileng.htm

Manufacturer's/Distributor's Comments:

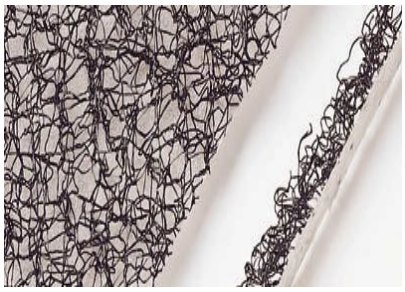
Called "Flatback," these Enkamat products have a two-dimensional nylon layer on the bottom of the matting to form a more closed "flat" structure on the underside. They are commonly used in regions with highly erosive silts or sandy soils and act as a form to hold a variety of fill materials. Typical applications include streams, rivers, levees and on reservoir banks.

Erosion Control Products Fact Sheet
Enkamat 7900 Series

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic turf reinforcement mat. Lightweight, nonwoven geotextile heat-bonded to the bottom of the matrix.



Enkamat 7900 Series

Erosion Control Function:

Used to provide more intimate contact with highly erosive soils in order to improve soil retention. Also used in conditions of high pore water pressures to retain soil particles while allowing water to pass through the product.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Weight: 424 to 560 g/m2
Enkamat is a three-dimensional nylon matrix joined at the intersections. 95% of the geomatrix is open space, which supplements nature's own erosion control system by reinforcing the plant roots. As the roots grow, they become entwined within the Enkamat, making an extremely stable cover. Its tough root-reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high-volume discharges. Enkamat can withstand velocities greater than 20 feet per second and has no buoyancy factor (specific gravity > 1).

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Colbund Geosynthetics
P.O. Box 1057, Sand Hill Rd
Enka, NC 28728
800 365-7391

Email

info@colbund-usa.com

Website

http://www.colbond-usa.com/civileng.htm

Manufacturer's/Distributor's Comments:

These products have a lightweight, nonwoven geotextile heat-bonded to the bottom of the matrix. They are used to provide more intimate contact with highly erosive soils in order to improve soil retention. Also used in conditions of high pore water pressures to retain soil particles while allowing water to pass through the product.

Erosion Control Products Fact Sheet
Enkamat S Series

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic turf reinforcement mat. Incorporates a high-strength geogrid with Enkamat.

Enkamat S Series

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. Very suitable for vegetating steep, weathered rock slopes and reinforcing soil covers on lining systems.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, pin, stake, or staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Enkamat is a three-dimensional nylon matrix joined at the intersections. 95% of the geomatrix is open space. Tensile strength of the grid: 370 lbs/ft to 7540 lbs/ft

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil. Use heavier pins in rocky conditions.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Colbund Geosynthetics
P.O. Box 1057, Sand Hill Rd
Enka, NC 28728
800 365-7391

Email

info@colbund-usa.com

Website

http://www.colbond-usa.com/civileng.htm

Manufacturer's/Distributor's Comments:

Enkamat "S" incorporates a high-strength geogrid with Enkamat. the geogrid reinforcement takes over when extreme conditions exist and where surface root reinforcement is not the only issue to be resolved. The combination of the open-structured Enkamat with the high tensile strength of the grid (1370 lbs/ft to 7540 lbs/ft) makes Enkamat "S" very suitable for vegetating steep weathered rock slopes and reinforcing soil covers on lining systems.

Erosion Control Products Fact Sheet
Florafab Sandwich Geotextile

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
A choice of sandwich compositions: Coir-Coir, Jute-Coir, Jute-Jute, filled with natural fiber like coir, jute or straw to form a composite product for erosion control.

Florafab Sandwich Geotextile

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Florafab Coir Geotextiles are generally a plain woven netting or mesh, with square openings about 1.5 to 2.5 sq. cm., made of Coir Yarn. Weight range: 0.4 to 1.25 g/m2

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:

Distributor:

Website

Manufacturer:

Florafab, SONA ENTERPRISES
208 379 8794 fax

Email

Website
http://www.florafab.com/coir.html

Manufacturer's/Distributor's Comments:

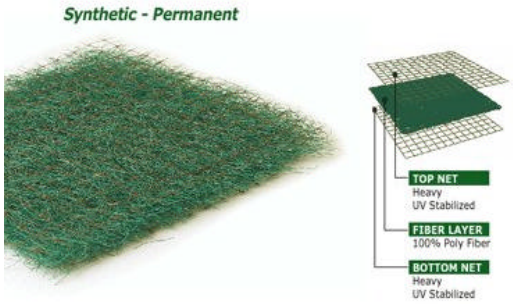
SANDWICH Geotextiles: Coir-Coir, Jute-Coir, Jute-Jute, filled with natural fibre like coir, jute or straw to form a composite product with unique set of properties to meet specific geotechnical needs. The sandwich product may also be pre-seeded for quick establishment of vegetation. Useful in erosion control in critical areas.
NATURAL AND ORGANIC
(Made from coconut fibre)
ECOFRIENDLY & BIODEGRADABLE.
(Degrades in around two years.)
DISINTEGRATES TO FORM HUMUS.
(Adds 2 Tons of nutrients per acre on decomposition)
RESISTANT TO ROT, MOULDS, MOISTURE.
(Retains 20% of its strength even after one year in soil. 40% when completely immersed in water and 50% when used under the sea)
RETAINS WATER, PROMOTES VEGETATION GROWTH.
(Retains water to the extent of 2 times its own weight. Non-woven needle punched retain about 6 times their own weight)
ALLOWS EXCESS WATER TO FLOW

Erosion Control Products Fact Sheet
GFP-12 Double Net Synthetic Fiber

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
100% synthetic polypropylene turf reinforcement mat. To be used on slopes of 1:1 or greater and channels. Rated permanent. Functional longevity permanent.



GFP-12 Double Net Synthetic Fiber

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's instructions and install as shown on drawings. It may be necessary to smooth the ground prior to blanket installation in order to assure better soil/blanket contact.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Fiber: Polypropylene
Fiber Content: 100%
Width (Feet/Meters): 8/2.4
Length (Feet/Meters): 67.5/20.5
Area (Square Yards/Square Meters): 60/50
Weight (Lbs Sq. Yd./Kg/Sq.Meters): .75/.406
Weight per Blanket (Pounds/Kilograms): 45/20.4
Functional Longevity (Months): Permanent
Top Net Type 1 (Permanent): Heavy
Bottom Netting Type (Permanent): Heavy

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Telfer Geosynthetics
1150 Willow Pass Rd
Pittsburg, CA
800 956-9999

Website

Manufacturer:

Greenfix America
PO Box 1620
Calipatria, CA
760 348-7600

Email

sales@greenfix.com

Website

http://www.greenfix.com

Manufacturer's/Distributor's Comments:

Synthetic Fiber Permanent Erosion Control & Turf Reinforcement Mat

Erosion Control Products Fact Sheet
KoirBed

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Rectangular matrix of coir fiber encased in high strength coir netting. 2" thick x 30" wide x 10'-0" long.

No graphic available

KoirBed

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed or planting medium in wet areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Clear and smooth soil surface before installation. Stake or otherwise anchor in place, following manufacturer's installation guide. Can plant container or bare root plants into medium.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Standard Size 2" thick x 30" wide x 10'-0" long.
Approximately 500 pieces per truckload.

Construction Complexity: Low

Ancillary Facilities:

Stake or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Relies on establishment of robust perennial vegetation for long-term stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation. Can be custom made to size specifications.

Contact Information:
Distributor:

Website

Manufacturer:

Nedia Enterprises
888 725-6999

Email

Website
http://www.nedia.com/

Manufacturer's/Distributor's Comments:

Description
Rectangular matrix of coir fiber encased in high strength coir netting.

Advantages
1.100% natural, organic and biodegradable.
2.Ideal for wetlands, shores of tidal marshes, lakes, reservoirs as well as banks of rivers and streams.
3.Excellent for use as prevegetated mat and for on-site planting.
4.High tensile strength.
5.Superior structural integrity and dimensional stability.
6.Built-in holes can be incorporated for easy planting.
7.Can be custom made to any size and thickness.
8.Easy to install.
9.Traps sediments and encourages deposition.
10.Economic.

Erosion Control Products Fact Sheet
Miramat TM8

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic turf reinforcement mat.

Miramat TM8

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Miramat® TM8 is shipped in rolls 3.7m wide by 30.5 m long (12’ x 100’). A full roll can easily be handled and installed by two people. Installation procedures vary according to the application. Follow manufacturer's installation guide. Smooth slope first, then install.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Wide rolls. 3.7m X 30.5 m (12’ X 100’)
100% UV stabilized polypropylene
Flexibity provides for simplified installation
Available in Green or Black

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

TC Mirafi
365 South Holland Drive
Pendergrass, GA 30567
888 795-0808

Email

Website

http://www.tcmirafi.com

Manufacturer's/Distributor's Comments:

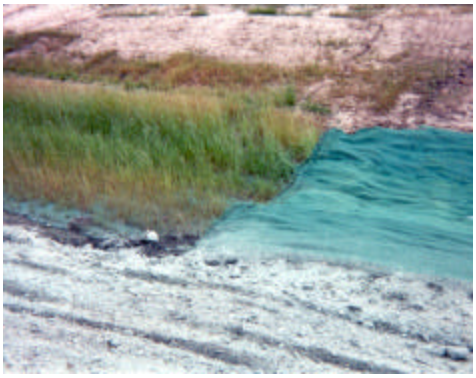
M8 product Miramat® TM8*
Geosynthetic Rolled Erosion Control Mat (RECM) for Bare Soil Retention, Revegetation and Turf Reinforcement
TC Mirafi® offers a wide range of woven and nonwoven geotextiles for erosion control applications. These fabrics are cost-effective elements which improve and enhance modern construction techniques in a variety of civil engineering applications.
Product Description
Mirafi® Miramat® TM8 is a "total" geosynthetic rolled erosion control mat created to serve as both an Erosion Control, Revegetation Mat (ECRM) and Turf Reinforcement Mat (TRM). Mirafi® Miramat® TM8 flexible three-dimensional structure is composed of yarns tufted into an open woven fabric.
Mirafi® Miramat® TM8 is thick, highly porous, and very flexible, all of which enhance the mat's ability to nurture vegetative growth. This unique construction produces a strong mat which is used in conjunction with topsoil and seed to create strong, durable and continuous soil/root mat matrices, and providing erosion protection, greatly enhancing the water flow resistance of vegetation.

Erosion Control Products Fact Sheet
P300 Synthetic Reinforced Mat

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
All polypropylene materials. Lighter duty than P550.



P300 Synthetic Reinforced Mat

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

NET
extra heavyweight UV stabilized polypropylene 5 lbs/1000 ft2 (2.44 kg/100 m2) approx wt
UV STABILIZED POLY FIBER
0.7 lbs/yd2 (0.38 kg/m2)
BOTTOM NET
Heavyweight UV stabilized polypropylene 3 lbs/1000 ft2 (1.47 kg/100 m2) approx wt
THREAD
UV stabilized polypropylene

Construction Complexity: Low

Ancillary Facilities:

Pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:

Distributor:

Website

Manufacturer:

North American Green
14649 Highway 41 North
Evansville , IN 47725
800 772-2040

Email

Website

http://www.nagreen.com/

Manufacturer's/Distributor's Comments:

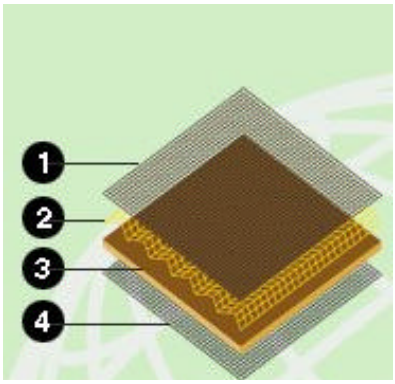
The P300 features a 100% UV stabilized polypropylene fiber matrix stitch bonded with UV stabilized thread between a heavyweight UV stabilized top netting and UV stabilized bottom netting.
The P300 is designed to provide long-term erosion protection, vegetation enhancement and permanent vegetation reinforcement in areas where the establishment of a good vegetative stand will take more than three to five years.

Erosion Control Products Fact Sheet
P550 Composite Turf Reinforcement Mat

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
All polypropylene materials. Heavy duty.



P550 Composite Turf Reinforcement Mat

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Top net: 24 lbs/1000 Sq Ft Black Polypropylene
Center Netting: 24 lbs/1000 Sq Ft black polypropylene-corrugated
Matrix material: 100% polypropylene
Bottom Net: 24 lbs/1000 Sq Ft black polypropylene
With vegetation, resists shear stresses up to ten pounds per square foot.

Construction Complexity: Low

Ancillary Facilities:

Pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock or concrete in a small channel.
Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

North American Green
14649 Highway 41 North
Evansville , IN 47725
800 772-2040

Email

Website

http://www.nagreen.com/

Manufacturer's/Distributor's Comments:

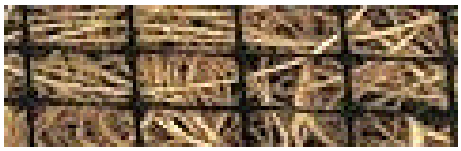
Extreme slopes, super high flow channels and areas where good vegetation can take years to establish require the toughest level of erosion protection and vegetation reinforcement on the market today. The P550 CompositeTurf Reinforcement Mat unites a 100% UV stabilized polypropylene fiber matrix with an ultra high-strength three-dimensional triple netting structure. The result? You get the most powerful level of immediate erosion protection and permanent vegetation reinforcement available in the industry today. P550's poly fiber matrix and tough three-dimensional structure empowers vegetation to resist shear stresses up to ten pounds per square foot, enabling you to use grasses in applications usually designated to concrete only!

Erosion Control Products Fact Sheet
Permamat Stabilization Blanket XCEL 100

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Turf reinforcement mat made of excelsior with plastic netting on both sides.



Permamat Stabilization Blanket XCEL 100

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Erosion control turf reinforcement mat (EC-TRM) to reinforce roots and distribute loads on saturated soils.
Specification: 4'
Matrix: Excelsior
Width (ft/meters): 4' / 1.2192
Length (ft/meters): 75' / 22.86
Area (sq yds/sq meters): 33.3 / 27.8421
Weight (lbs sq yds/kg sq m): 2.13 / 0.9661
Top Netting: Extra Heavy Weight
Bottom Netting: Extra Heavy Weight
Stitching: Photodegradeable On 2" centers

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Emerald Seed and Supply
9330 N. E. Halsey
Portland, OR 97220
800 826-8873

Email

info@emeraldseedandsupply.com

Website

http://www.emeraldseedandsupply.com/erosioncontrol/ec blankets.html

Manufacturer's/Distributor's Comments:

Erosion control turf reinforcement mat (EC-TRM) to reinforce roots and distribute loads on saturated soils.

Erosion Control Products Fact Sheet
Permamat Stabilization Blanket XCEL 150F

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Turf reinforcement mat made of excelsior with plastic netting on both sides. Can be used on channels with flows up to 15fps.

Permamat Stabilization Blanket XCEL 150F

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in channels.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, pin, stake, or staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Geo-composite erosion control turf reinforcement mat (EC-TRM) distributes shear stresses and lift forces in channels.
Enscapuslated fabric with flow velocity to 15 fps.
Specification: 4' Matrix: Excelsior
Width (ft/meters): 4' / 1.2192
Length (ft/meters): 75' / 22.86
Area (sq yds/sq meters): 33.3 / 27.8421
Weight (lbs sq yds/kg sq m): 2.22 / 1.007
Top Netting: Heavy Weight
Bottom Netting: Light Weight
Stitching: Photodegradeable On 2" centers
Geotextile 3.2 oz

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Emerald Seed and Supply
9330 N. E. Halsey
Portland, OR 97220
800 826-8873

Email

info@emeraldseedandsupply.com

Website

http://www.emeraldseedandsupply.com/erosioncontrol/ec blankets.html

Manufacturer's/Distributor's Comments:

XCEL 150F
Geo-composite erosion control turf reinforcement mat (EC-TRM) distributes shear stresses and lift forces in channels. Enscapuslated fabric with flow velocity to 15 fps.

Erosion Control Products Fact Sheet
Permamat Stabilization Blanket XCEL 200F

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Turf reinforcement mat made of excelsior with plastic netting on both sides. Can be used on channels with flows up to 20 fps.

Permamat Stabilization Blanket XCEL 200F

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. Primarily used in channels.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, pin, stake, or staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Geo-composite erosion control turf reinforcement mat (EC-TRM) distributes shear stresses and lift forces in channels.
Encapsulated fabric with flow velocity to 20 fps (Leading University Hydrology Lab).
Specification: 4'
Matrix:: Excelsior
Width (ft/meters): 4' / 1.2192 Length (ft/meters): 75' / 22.86
Area (sq yds/sq meters): 33.3 / 27.8421
Weight (lbs sq yds/kg sq m): 2.34 / 1.0614
Top Netting: Extra Heavy Weight
Bottom Netting: Extra Heavy Weight
Stitching: Photodegradeable

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:1h

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:

Distributor:

Website

Manufacturer:

Emerald Seed and Supply
9330 N. E. Halsey
Portland, OR 97220
800 826-8873

Email

info@emeraldseedandsupply.com

Website

http://www.emeraldseedandsupply.com/erosioncontrol/ec_blankets.html

Manufacturer's/Distributor's Comments:

XCEL 200F

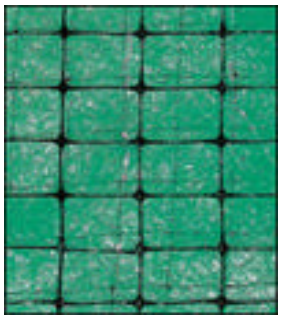
Geo-composite erosion control turf reinforcement mat (EC-TRM) distributes shear stresses and lift forces in channels. Encapsulated fabric with flow velocity to 20 fps (Leading University Hydrology Lab).

Erosion Control Products Fact Sheet
Recyclex Turf Reinforced Matting

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Turf reinforcement mat made from recycled fibers.



Recyclex Turf Reinforced Matting

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.
Securing devices shall be 11-gauge 6" x 1" x 6" metal staples or equal. Install at a rate of one staple for every one lineal foot of TRM length and one staple for every 2 feet of width.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Recyclex® Roll Dimensions:
Width: (ft.) 8.0 (2.4m)
Length: (ft.) 90.0 (27.43m)
Area: (Square Yards) 80.0 yd2 (66.89m2)
Weight: (pounds) 50 lbs (22.68 kg)
Color: Green

Construction Complexity: Low

Ancillary Facilities:

Pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation. Made from recycled materials.

Contact Information:
Distributor:

Website

Manufacturer:

American Excelsior Company
Arlington, TX
800 777-7645

Email

Website

http://www.curlex.com/pro_recyclex.php

Manufacturer's/Distributor's Comments:

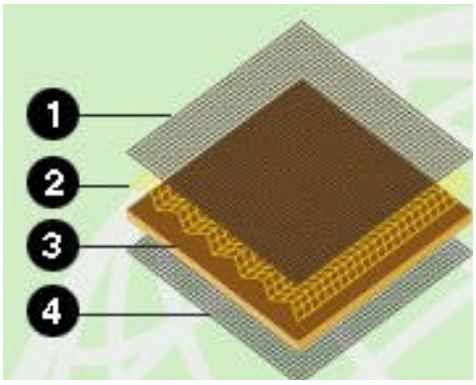
Recyclex® Turf Reinforcement Matting (TRM) is a unique, patent pending, permanent, erosion control blanket made from 100% recycled, post consumer goods. Its fibers are made from 100% recycled- "green soda bottles."
Product
Recycled Fibers shall be approximately 6" in length, crimped to allow curl, soft barbed fiber to allow fiber interlocking, which is critical to a strong matrix. The fibers shall be encased in between two layers of heavy UV stabilized polypropylene netting, and stitched top to bottom to form a three-dimensional matrix. The unique recycled polyester fibers have a memory of 95% of it's original crimp after load or hydraulic events. The fibers shall have a specific gravity of greater than one, which means it will not float in a hydraulic application unlike other polypropylene fibers.
Its three dimensional matrix is specifically designed to provide permanent surface support, underneath vegetation and/or structural support for vegetation above, and provides a permanent structural matrix for the root system to grow into. Additionally, it may be installed as a "stand alone" erosion control blanket (ECB) over the top of soil and seed, which allows vegetation to grow up through it's permanent matrix.

Erosion Control Products Fact Sheet
SC250 Composite Turf Reinforcement Mat

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Coir and straw filler. Polypropylene matrix and net.



SC250 Composite Turf Reinforcement Mat

Erosion Control Function:

Three-dimensional mat holds soil in place, creates seedbed for seeding, and reinforces roots. May be used in water conveyance ditches and swales.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Top Net: 5 lbs/1000 sq ft. black polypropylene
Center Net: 24 lbs/1000 sq ft black polypropylene-corrugated
Matrix Material: 70% straw/ 30% coconut
Bottom Net: 5 lbs/1000 sq ft black polypropylene
With vegetation, resists shear stresses up to six pounds per square foot.

Construction Complexity: Low

Ancillary Facilities:

Pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or re-planting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:

Distributor:

Website

Manufacturer:

North American Green
14649 Highway 41 North
Evansville, IN 47725
800 772-2040

Email

Website

http://www.nagreen.com/

Manufacturer's/Distributor's Comments:

The SC250 Composite Turf Reinforcement Mat combines a 70% straw/30% coconut fiber matrix with a three-dimensional UV stabilized triple netting structure. The result? You get a higher level of immediate erosion protection than temporary blankets for up to 24 months. And the SC250's high strength permanent three-dimensional structure empowers vegetation to resist shear stresses up to six pounds per square foot. That's two pounds per square foot greater than the toughest stand of unreinforced grass!

Erosion Control Products Fact Sheet
Slopetame2

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic turf reinforcement mat.

Slopetame2

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope first then install.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Manufactured in 1 square meter units (3.3' x 3.3') or quarter-meter units (1.65 feet x 1.65 feet) and assembled into rolls. The 100% recycled plastic rings and grid are molded onto an open weave fabric.

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil. .

Location
Rural
Urban

Soil Category
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair or replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel or channel banks. Promotes establishment of vegetation. Provides "invisible" structural support when vegetation is established. Porous.

Contact Information:
Distributor:

Website

Manufacturer:

Invisible Structures, Inc.
20100 E. 35th Drive
Aurora, CO 80011-8160
800 233-1510

Email

sales@invisiblestructures.com

Website

http://www.invisiblestructures.com/

Manufacturer's/Distributor's Comments:

Slopetame2 is a three-dimensional erosion control blanket which covers steep slopes of weak and/or eroding soils by easily unrolling lightweight large rolls downhill. The 100% recycled plastic rings and grid are molded onto an open weave fabric which also serves to cover soils and provide a support structure for vegetation.
Trees and shrubs can be easily planted in cutout sections by clipping the grid with pruning shears and then digging holes. Fill the blankets with soil and hydroseed or plant ground covers on the slope for a quick finished appearance that is structurally sound.
Working on a Slope Made Easy!
Rolls are easily secured at the top of the slope by anchoring rebar between the rings. Custom roll sizes are available and washers are included to fasten pegs and holes together with adjoining rolls.

Erosion Control Products Fact Sheet
TENAX Multimat R Geomat

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic muliti-layer matrix soil stabilizer installed on the soil surface.

TENAX Multimat R Geomat

Erosion Control Function:

Three-dimensional plastic mesh used to reinforce vegetation for erosion control.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Not approved

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, staple in place, fill or brush in 20mm depth of topsoil, broadcast seed or mix seed with soil.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Thickness is about 20 mm. Manufactured by assembling and stitching together several layers of polypropylene (PP), extruded bioriented geogrids.

Construction Complexity: Medium

Ancillary Facilities:

Anchoring pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Lightweight soil surface protection allows plant growth.

Contact Information:
Distributor:

Website

Manufacturer:

Tenax
800 356-8495

Email

Website

http://www.tenax.net/geosynthetics/products/tenax_multimatr.htm

Manufacturer's/Distributor's Comments:

The three-dimensional "gripping" TENAX MULTIMAT and TENAX MULTIMAT R geomats are purposely designed for the protection and planting of slopes subjected to surface erosion whenever a suitable vegetative substrate soil already exists. The manufacturing process considerably enhances the mechanical properties of the base polymer, thus providing a high tensile strength (minimum of 8 kN/m). Geomats of this kind are composed of two layers of geogrid placed above and below a single central layer, mechanically folded so as to give thickness and three-dimensionality to the geomat. The two flat geogrid layers confer a high tensile strength and allow for minimal elongation of the geomats. The dense folding of the central core limits the deformation of the geomat when filling with topsoil, conferring it with optimal bearing strength. The layers are held in place by mechanically stitching them together with a highly resistant polypropylene yarn during the manufacturing process.

Erosion Control Products Fact Sheet
Tensar TM 3000

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Synthetic.

Tensar TM 3000

Erosion Control Function:

Three-dimensional mat hold soil in place and creates seedbed for seeding and reinforces roots. May be used in channels.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, pin, stake, or staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

The High Performance Turf Reinforcement Mat shall be a three-dimensional, multi-layered structure of polyethylene netting designed specifically for erosion control and turf reinforcement. The mat is stabilized to resist ultraviolet degradation and is inert to chemicals normally encountered in a natural soil environment. The mat also conforms to the following physical properties:
Mass per Unit Area: 410g/m2
Thickness: 12.7mm
Moisture Absorption: 0.01 (max)%
Porosity: 95%

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed. Requires that the appropriate perennial vegetation becomes established for long-term channel stability.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:

Distributor:

Website

Manufacturer:

Tensar International
New Wellington Street
Blackburn, UK BB2 4PJ
+44 (0) 1254 262431

Email

Website

http://www.tensarcorp.com/case/content_trm.htm

Manufacturer's/Distributor's Comments:

The Tensar Mat range controls soil erosion.
The Mat is designed to initially stabilise the surface whilst assisting vegetation to establish. It then goes on to provide long-term, tenacious reinforcement of the root system. Reinforced grass slopes have been shown to have an erosion resistance able to withstand current velocities in excess of 4m/sec.
Tensar Mat for erosion protection - the benefits
Cost-effective long-term solution for erosion control
Easy, quick and economic to install
Natural, attractive appearance
Environmentally safe
Maintains close contact with the soil profile for maximum root anchorage
Aids establishment of initial vegetation growth
Avoids topsoil creep on slopes
Protects against 'bald spots' on grass slopes subject to high wear
May be used with hydraseeding and soil nails
Controlling erosion on rock slopes
Weathering and freeze-thaw action can often lead to fracturing and spalling on rock slopes, creating the hazard of falling rock fragments and ongoing erosion. Tensar grids can be draped over the face and secured with rock anchors to act as a cladding to control loose rock fragments and remove the hazard. This can allow soil particles to be retained and facilitates the subsequent development of vegetation. Generally, Tensar GM4 is used for this application. It is manufactured from HDPE and has outstanding impact resistance and durability. Tensar Mat is also available in a pre-filled format with established grass from GreenKeeper Ltd.
Tensar GM4 for rock face protection - the benefits
Cost-effective solution
High impact resistance
Easy to install, wide, lightweight rolls
Non-corrodible, durable

Erosion Control Products Fact Sheet
TerraGuard 44P

Caltrans
New Technology Report

Description:

Turf reinforcement mat (TRM).
Three-dimensional geosynthetic mat consists of a dense web of green polyolefin thread.

TerraGuard 44P

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth and compact slope surface, broadcast seed, insert uphill end of mat into key trench, staple in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Thickness: 0.35 in
Resiliency: 80 %
Tensile Strength: 145 x 110 lbs/ft
Tensile Elongation: 50% (max)
Moisture Absorption : 0.01% (max)
Mass Per Unit Area: 8.0oz/sy
Porosity Calculated: 95%
Ground Cover Factor Light Projection Analysis: 60%
Ultraviolet Stability: 80%

Construction Complexity: Low

Ancillary Facilities:

Pin length may need to be increased due to saturated soil.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Unknown

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation.

Contact Information:
Distributor:

Website

Manufacturer:

Webtec, Inc. Geosynthetics
Charlotte, NC 28219
800 438 - 0027

Email

Website

http://webtecgeos.harborwebs.com/

Manufacturer's/Distributor's Comments:

TerraGuard 44P is a three dimensional geosynthetic mat effective in a wide range of vegetation establishment applications. It protects newly seeded areas from the erosive forces of wind and rain. The UV stabilized mat provides permanent erosion control through turf reinforcement. Typical applications include slope stabilization and channel lining. TerraGuard 44P consists of a dense web of green polyolefin thread.

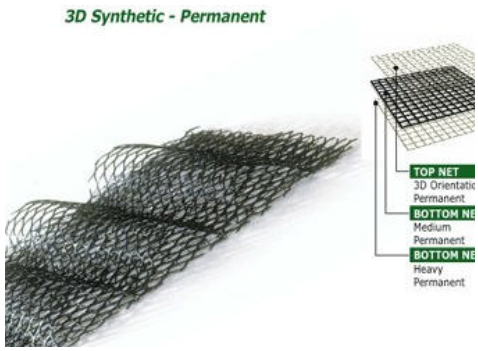
Erosion Control Products Fact Sheet
Trinter Double Net Synthetic Fiber

Caltrans

New Technology Report

Description:

Turf reinforcement mat (TRM).
100% synthetic polypropylene turf reinforcement mat (open construction). To be used on slopes of 1:1 or greater and channels. Rated permanent. Functional longevity permanent.



Trinter Double Net Synthetic Fiber

Erosion Control Function:

Three-dimensional mat holds soil in place and creates seedbed for seeding and reinforces roots. May be used in water conveyance ditches and swales and other critical areas.

Caltrans BMP ID
SS-7

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Follow manufacturer's installation guide. Smooth slope surface, insert uphill end of mat into key trench, pin, stake, or staple in place, fill or brush in topsoil, broadcast seed or mix seed with soil. May be hydroseeded.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
High

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Fiber: N/A
Fiber Content: Open
Width (Feet/Meters): 6.56/2
Length (Feet/Meters): 83/25.3
Area (Square Yards/Square Meters): 60/50
Weight (Lbs Sq. Yd./Kg/Sq.Meters): .56/.34
Weight per Blanket (Pounds/Kilograms): 40/18
Functional Longevity (Months): Permanent
Top Net Type 1 (3D Orientation/Permanent): Heavy
Bottom Netting Type 1 (UV Stabilized Permanent): Medium
Type 2 (UV Stabilized Permanent): Heavy

Construction Complexity: Low

Ancillary Facilities:

Staple or pin length may need to be increased due to saturated soil.

Location	*Soil Category*	*Steepness*
Rural	Not rocky	> 1:1
Urban		

Cost: Medium

Erosion Control Products Fact Sheet
Trinter Double Net Synthetic Fiber

Caltrans

New Technology Report

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed. May require watering, weeding, or replanting during vegetation establishment period

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Plastic may become exposed.

Advantages:

Easier to install than rock in a small channel. Promotes establishment of vegetation. Long-lasting.

Contact Information:
Distributor:

Telfer Geosynthetics
1150 Willow Pass Rd
Pittsburg, CA
800 956-9999

Website

Manufacturer:

Greenfix America
PO Box 1620
Calipatria, CA
760 348-7600

Email

sales@greenfix.com

Website

http://www.greenfix.com

Manufacturer's/Distributor's Comments:

Synthetic Fiber Permanent Erosion Control & Turf Reinforcement Mat

Erosion Control Products Fact Sheet
Agrolok (gel)

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment, gel applied to soil to retain moisture.
May be used as a tackifier as well.

Agrolok (gel)

Erosion Control Function:

Improves plant growth for soil stabilization.
Can be used to temporarily bind soil particles together. Also dust control.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

SLOPE AREAS ...Apply Agrolok at the recommended rates based on the degree of slope following final ground preparation. Agrolok holds the soil in place until the plant roots have established themselves for long term erosion control.
FLAT AREAS ... Agrolok offers protection from destabilization of soil from wind or rain while enhancing germination.
HYDROMULCHING ... Agrolok is to be blended into the hydromulch tank as an addition to or a replacement for the tacifier.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Agrolok is a moisture protecting gel that prevents erosion while retaining moisture for enhanced germination and faster root establishment.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

\Issues and Concerns

Maintenance Requirements:

Reapply as needed

Maintenance Staffing/Equipment:

Laborer

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improves water holding capacity of soil for improved plant growth.

Contact Information:

Distributor:

Website

Manufacturer:

Agrosoke
1004 N. Bowen Rd
Arlington, TX 76022
800 880 AGRO

Email

agrosoke@earthlink.net

Website

http://members.tripod.com/agrosoke.com/id17.htm

Manufacturer's/Distributor's Comments:

Agrolok Moisture Protecting Gel prevents erosion while retaining moisture for enhanced germination and faster root establishment. Agrolok, when watered in, or sprayed on in a hydrated form, coats and moisturizes each particle of soil, root and/or seed. It dries to a clear membrane holding everything in place even under extreme weather conditions. Agrolok is a topical application that is most effective when used in conjunction with Agrosoke or Agrogold.
SLOPE AREAS ... Agrolok is a must for all slope areas... Apply Agrolok at the recommended rates based on the degree of slope following final ground preparation. Agrolok holds the soil in place until the plant roots have established themselves for long term erosion control. Mixing Agrosoke into the slope area during preparation assures moisture retention on a permanent basis.
FLAT AREAS ... Agrolok offers protection from destabilization of soil from wind or rain while enhancing germination. Agrolok will slow down the evaporation rate from the soil and if the soil has been prepared with Agrosoke in the bed prep, there will be moisture held for uptake by the roots as soon as germination occurs.
HYDROMULCHING ... Agrolok is to be blended into the hydromulch tank as an addition to or a replacement for the tacifier. Agrolok will coat and moisturize the mulch as well as the grass in all applications, if the bed prep includes the addition of Agrosoke, there will be long term moisture savings, as well as improved soil structure for reduced run-off and optimum plant growth

Erosion Control Products Fact Sheet
BIOCOL

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil conditioner. Soil amendment used with hydroseeding.

BIOCOL

Erosion Control Function:

Improves plant growth for soil stabilization. Fixes and conditions soils.Multi-functional: film-forming, adhesive, gelling agent, water-retentive, enhances the regeneration of soil microbes, and is a growth stimulant that can be rapidly assimilated by seedlings.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Spray on with hydroseeder. 200 to 400 kg/ha

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.
Use: destructured substrates (sand, schis t, etc.) or in climates with low rainfall.

Specifications (Product Data):

100% plant and algae extract based.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

binds and improves the physical characteristics of soil and its capacity to store and provide nutriments to plants.

Contact Information:
Distributor:

Euro-Tec
130 Avenue St-Exupéry
BRON, France 69500
33 4 72 78 84 90

Website

http://www.euro-tec.fr/fixategb.htm

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

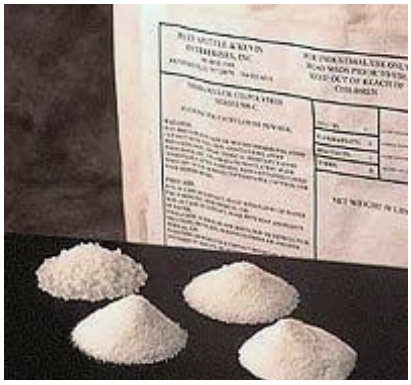
BIOCOL stabilises and regenerates soils. It is a dual-action conditioner for hydroseeding. In addition to the following physical properties -- film forming, adhesive, gelling agent, water-retentive -- BIOCOL acts as a very efficient regenerator of soil microbes and is a growth stimulant that can be rapidly assimilated by seedlings.

Erosion Control Products Fact Sheet
Co-Polymer Gel

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment; polymer used to increase water retention for plants. Hydroseed, hydromulch additive.



Co-Polymer Gel

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Broadcast onto soil surface and mix in. Or add to hydroseed mix.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Copolymer of acrylamide

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Very slippery when wet.

Advantages:

Increases soil water holding capacity.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Copolymer of acrylamide, a super absorbent holding up to 400 times its weight in distilled water. Ideal for laying sod, landscaping and as a root dip for transplants. Available in four different particle sizes.

Erosion Control Products Fact Sheet
DriWater

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Water source that is bound in the form of a gel-like solid that provides consistent subsurface irrigation to plants up to three months.

DriWater

Erosion Control Function:

Improves plant growth for soil stabilization by slowly releasing water to the plant during dry periods.

Caltrans BMP ID
None

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Follow manufacturer's instructions for proper installation. Install before soils dry out and reapply before plant dessicate.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Specifications – 3" Tube & Gel Pack
DRiWATER is time-release water bound in the form of a solid gel for the watering and establishment of plant materials. DRiWATER assembly will include 76mm (3-inch) diameter PVC Tube with Cap and a Gel Pac containing the DRiWATER Gel. Assembly includes a 76mm (3-inch) diameter PVC Tube with Cap and a Gel Pac. Ingredients are 97.85% water, 2% cellulose gum and .15% aluminum sulfate.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

The Dri-Water gel may need to be replaced during the growing season if the gel has disappeared.

Maintenance Staffing/Equipment:

Inspect monthly during the growing season to make sure some gel is still available.

Maintenance Level of Effort:

Low

Constraints:

Bulkiness limits how much product can be carried off-road. Requires careful monitoring to avoid drying out at critical time for plants.

Advantages:

Useful to establish shrubs and trees where irrigation systems or truck watering is less cost-effective.

Contact Information:
Distributor:

Website

Manufacturer:

DriWater, Inc.
600 East Todd Rd.
Santa Rosa, CA 95407
800 255-8458

Email

driwater@driwater.com

Website

http://www.driwater.com

Manufacturer's/Distributor's Comments:

DRiWATER is a patented product that consists of 98% purified water and 2% food grade ingredients. It is bound in the form of a gel-like solid that provides consistent subsurface irrigation to plants up to three months! DRiWATER is NOT a polymer or wetting agent and is organic and completely non-toxic.

DRiWATER provides the only irrigation solution that is based on modifying the properties of water, and thus, is the only irrigation solution that transcends the constraints of traditional methods of accessing, transporting, storing or applying water to plants. It is the only product on the market that can deliver moisture directly to a plant's roots, making frequent or repeated watering unnecessary and saving labor and equipment costs. Additionally, there is no water wasted or need for a permanent water source."

Erosion Control Products Fact Sheet
EssentialSoil

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment. Organic based soil blend that mimics the texture and microbiology of native topsoil.

EssentialSoil

Erosion Control Function:

Improves plant growth for soil stabilization.
Provides a living growing medium for plants that is highly resistant to erosion. Microorganisms along with organic and mineral products combine to form a soil structure with good permeability, stability and water retention.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Applied in the same manner as topsoil is applied. Loader, dump truck, conveyor belt, etc. Surface upon which product is to be applied must be roughened to prevent slippage between existing surface and EssentialSoil. Usually applied to a depth of 300mm or greater. Also, can be applied onto steep hillsides as far as 450 feet away through air hoses in 3-foot layers. Manufacturer claims it will stick to 70 degree slopes and remain without the use of erosion control fabrics or retaining walls.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.
Tested at the Caltrans Soil Erosion Research Lab, June 2000.

Specifications (Product Data):

"patent pending soil blend"

Construction Complexity: Low

Ancillary Facilities:

May require seed and mulch for initial erosion protection. Control concentrated drainage from upslope. Specialized applicator require to apply to steep areas.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
> 1:1

Cost: Medium

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to apply.

Maintenance Level of Effort:

Low

Constraints:

Bulky, requires heavy equipment to apply in large areas.

Advantages:

Sticks to steep slopes, provides rich growth medium for plants.

Contact Information:
Distributor:

Website

Manufacturer:

Soil Dynamics
P.O. Box 1289
Issaquah, WA 98027
425 392-1200

Email

soilinfo@soildynamics.com

Website

http://www.soildynamics.com

Manufacturer's/Distributor's Comments:

EssentialSoil possesses a physical structure that allows it to adhere to extremely steep slopes in thick layers and withstand the rigors of nature before re-vegetation takes hold – in most cases without the costly protection of geo-textiles or retention walls. Its organic structure reduces sedimentation and runoff, benefiting our streams, fish and wildlife. Augmenting its physical structure is a phenomenal capability as a growing medium. Rich in beneficial microbial activity and able to retain plant moisture while maintaining high percability, our soil enhances rapid and healthy root, stem and leaf growth. This is extremely beneficial, not only for slope restoration, but for any type of plant installation. Reforesting of slopes and re-establishing the ecosystem can happen within the first year versus 50 to 100 years or more.

EssentialSoil formulas can be modified prior to installation to meet the precise planting needs of any project. Each ecosystem, whether it be grassland or coniferous forest, ornamental shrubs or flowers, needs a different ecological balance within the soil in order to thrive. Tailoring the soil to the environment before it is installed on-site ensures the healthiest and most rapid vegetation establishment.

Erosion Control Products Fact Sheet
Fertil-Fibers

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment. A spray-on mulch with nutrients to enhance soil microorganisms.


Fertil-Fibers

Erosion Control Function:

Improves plant growth for soil stabilization.
Nutritional mulch is intended to restore humus and increase soil fertility and tilth, which then provide a better medium for growing plants. Added tilth means soil holds water better, and better plant growth decreases erosion.

Caltrans BMP ID
SS-3

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Fertil-Fibers NutriMulch is generally applied at a rate of 2,000 lbs. per acre (0.2242 kg/m2) for hydroseeding or drill seeding disturbed sites. Sites composed of "borrow material" containing low or no organic matter may require higher volumes of Fertil-Fibers NutriMulch.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant and soil type.

Specifications (Product Data):

Nutrient Ratio: N-P-K = 6-4-1
Organic Substances 85.00%
Crude Fiber 15-17.00%
Carbon/Nitrogen Ratio 4.5:1%
Nitrogen (total) 6.25%
Nitrogen (from proteins) ..... >3.5%
Nitrogen (from non protein sources) ..... <3.0%
Available Phosophoric Acid (O205) ..... >4.0%
Potash ..... >1.0%
Magnesium 0.25-0.4%
Calcium ..... >2.5%

Construction Complexity: Low

Ancillary Facilities:

Apply with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
> 1:1

Cost: Low

Issues and Concerns

Maintenance Requirements:

Inspect as per SWPPP for rills and erosion. Reapply where soil surface is disturbed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Access for hydroseed machinery required. Source of water for slurry required.

Advantages:

Soil builder for poor soils as well as mulch.

Contact Information:
Distributor:

Website

Manufacturer:

Quattro Environmental, Inc.
649 'I' Avenue
Coronado, CA
619 522-0044

Email

Website

http://www.kiwipower.com/

Manufacturer's/Distributor's Comments:

Restores humus, provides sustained nutrients for long-lived plant growth, and is an affordable organic fiber bulk. Safe and easy to use "organics booster" enables soil to function as an integrated, ecologically balanced system. Addresses the self-sustaining health of plants, making soil sufficiently rich so plants get all the nutrients they need in a natural, slow release process. Improves the soil's microorganisms by supplying the nutrient and energy sources that enable them to function in their role of decomposing decayed vegetation, animal, and other soil biota.

Other benefits include reduction or possible elimination of need for addition of costly topsoil to disturbed sites and reduction in the need for complementary fertilization. It does not import weeds or encourage weed growth and does not rob the soil of nitrogen. Slow, sustained release of organically bound nitrogen provides sufficient supply of all vital nutrients to germinating seeds and growing plants throughout the first growing season and longer (versus soluble nitrogen, which is often depleted prior to seed germination). Use results in far lower concentrations of nitrate in ground water than chemical fertilizers. Economical, environmentally safe, easy to use.

Erosion Control Products Fact Sheet
FinnHG

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment, biostimulant and nutrient seed dressing which maximizes germination, vigor, and uniform stands of new turf, along with superior root systems.

No graphic available

FinnHG

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Follow manufacturer's specifications. Apply at a rate of about 133 ounces per acre. Apply with hydroseeder.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Unknown

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Unknown

Maintenance Staffing/Equipment:

Unknown

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

FinnHG is a premium liquid biostimulant and nutrient seed dressing which maximizes germination, vigor, and uniform stands of new turf, along with superior root systems. FinnHG contains a formula of key primary and secondary nutrients which are complexed in an organic acid base to ensure absorption by the seed during agitation.

Contact Information:

Distributor:

Website

Manufacturer:

Finn Corporation
800 543-7166

Email

Website

http://www.finncorp.com

Manufacturer's/Distributor's Comments:

FinnHG is a premium liquid biostimulant and nutrient seed dressing which maximizes germination, vigor, and uniform stands of new turf, along with superior root systems. FinnHG contains a formula of key primary and secondary nutrients which are complexed in an organic acid base to ensure absorption by the seed during agitation.

Erosion Control Products Fact Sheet
FinnHST Humic Acid

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment: liquid humic acid designed specifically for use on compacted and/or sandy soil conditions.

No graphic available

FinnHST Humic Acid

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Follow manufacturer's specifications. Apply at a rate of about 333 ounces per acre. Apply with hydroseeder.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Unknown

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Unknown

Maintenance Staffing/Equipment:

Unknown

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Promotes nutrient availability and retention, and also slows down leaching of moisture and nutrients in the soil.

Contact Information:

Distributor:

Website

Manufacturer:

Finn Corporation
800 543-7166

Email

Website

http://www.finncorp.com

Manufacturer's/Distributor's Comments:

FinnHST is a concentrated liquid humic acid designed specifically for use on compacted and/or sandy soil conditions. FinnHST promotes nutrient availability and retention, and also slows down leaching of moisture and nutrients in the soil.

Erosion Control Products Fact Sheet
Forever Mulch

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Synthetic mulch made from recycled tires.

Forever Mulch

Erosion Control Function:

Improves plant growth for soil stabilization. Protects soil surface from rainfall impact.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

No information available.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

ForeverMulch is made from recycled waste tires with an added all-natural color coating. The coating is a non-hazardous formula created specifically for outdoor use.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Some weeding may be required. Replace as needed.

Maintenance Staffing/Equipment:

Laborer

Maintenance Level of Effort:

Low

Constraints:

Coating contains a pesticide, herbicide and fungicide which may limit the allowable use of the product. These chemicals also require additional worker safety procedures. Bulky - application over large areas may be labor intensive.

Advantages:

Using recycled materials has off-site environmental advantages.
Long lasting.

Contact Information:
Distributor:

Website

Manufacturer:

Global Constructs Group
PO Box 560580
Orlando, FL 32856-0580
888 852-1444

Email

Website

http://www.forevermulch.com/fmwhatis.htm

Manufacturer's/Distributor's Comments:

ForeverMulch is long-term alternative to wood mulch that can be customized to meet your requirements..

ForeverMulch is made from recycled waste tires with an added all-natural color coating. The coating is a non-hazardous formula created specifically for outdoor use. Using state-of-the art technology, the product and its specially formulated coating will last 15 years in most applications. ForeverMulch provides the same look as wood mulch, without the need for continuous replacement. The coating on the ForeverMulch chips makes the product fire -resistant. This special coating also contains a pesticide, herbicide and fungicide.

ForeverMulch can be used in several applications: landscaping, beautification of parks and recreation areas, agricultural applications, lining of retention ponds, drain field filler, and other construction applications.

Erosion Control Products Fact Sheet
Geofibers

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Permanent soil amendment. Polypropylene fibers are blended into soils to improve engineering properties of soil.

Geofibers

Erosion Control Function:

Reinforces soil and root structure which helps to hold vegetation in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Mix and incorporate fibers into existing soil. Construction with fiber reinforced soils is achieved using standard earthwork practices.

Effectiveness:

Unknown

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Fibers are typically 2-inch long, fibrillated, polypropylene. Fibers with different properties have been engineered to provide performance in many applications.

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Repair and replace as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Medium

Constraints:

Advantages:

Rapid deployment for temporary and permanent soil stabilization.

Contact Information:
Distributor:

Website

Manufacturer:

SI Geosolutions
6025 Lee Highway, Suite 435
Chatanooga, TN 37421
800 621-0444

Email

fixsoil@sind.com

Website

http://www.fixsoil.com/

Manufacturer's/Distributor's Comments:

Note:Use Internet exp, not netscape
Geofibers® polypropylene fibers are blended into soils to create an ideal reinforcement system for the repair of slope failures, reinforcement of pavement subgrades, foundation stabilization, and improvement of retaining wall backfill. By synergistically meshing with the soil already on site, Geofibers polypropylene fibers help create a soil reinforcement system with dramatically improved engineering properties.

Erosion Control Products Fact Sheet
Growplex-SP

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment. A natural humic acid-based water soluble powder with vital micronutrients for use as a foliar nutrient spray or soil drench for plant growth and development as a supplement to a balanced fertility program.

No graphic available

Growplex-SP

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Suggested application rate with a hydraulic seeding method is only one-half, up to one pound per acre.

Applied to soil or to plant leaves (overspray foliar application requires more product).

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Nitrogen: 4.0 %
Potassium as K20: 20.0 %
Phosphorus as P205: 20.0 %
Calcium: 1.0 %
Iron: 0.4 %
Sulfur: 0.4 %
Humic Acid: 45.0 %

Construction Complexity: Low

Ancillary Facilities:

Apply with hydroseeder or other spray equipment.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Manufacturer recommends reapplication for foliar applications.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to reapply.

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improves plant germination and growth by improving soil microbial activity and structure.

Contact Information:
Distributor:

Website

Manufacturer:

Sundine Enterprises
5325 Garland Street
Arvada, CO 80002-2941
800 830-4261

Email

inquiry@sundine.com

Website

http://www.sundine.com

Manufacturer's/Distributor's Comments:

Product Description:
A natural humic acid based water soluble powder with vital micronutrients for use as a foliar nutrient spray or soil drench for plant growth and development as a supplement to a balanced fertility program.

Product Information:
Grow-Plex SP is a water soluble source of humic acid. It also supplies high levels of soluble potassium and phosphorus in readily available forms. Combined with humic acid, the potassium, calcium, iron and sulfur can be rapidly absorbed and incorporated into the plant whether via soil or foliar application methods. Grow-Plex SP is compatible with almost all starter and foliar fertilizers for more efficient uptake and more sustained nutrition. Simply, it makes the fertilizer with which it is applied work better.

Erosion Control Products Fact Sheet
Growth Stimulant

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment used as a growth stimulant.

Growth Stimulant

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Application Rates:
Hydroseeding - Turf Establishment-25 lbs / acre
Mulch Binding:
6/1 to 4/1 Slope-25 lbs / acre
4/1 to 2/1 Slope-25 lbs + 10 lbs Locking Fibers
4/1 to 2/1 Slope-25 lbs + 16 lbs Tackifier
> 2/1 Slope-25 lbs + 20 lbs Locking Fibers
> 2/1 Slope-25 lbs + 32 lbs Tackifier

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant and soil type.

Specifications (Product Data):

Combination of seaweed extract and polymers of acrylamide.
Net Weight: 25 lbs / bag
pH Range: 7 .4 ± 0.2
Surface Tension: * 61.7 Dynes / CM
* Surface tension and viscosity testing based on simulated field application after 5 minutes of mechanical agitation.

Values based on 25 lbs of Growth Stimulant per 1000 gallons of water.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown
Max. 1v:1h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Stimulates plant top growth of turf grasses, increases root mass of plant, and enhances plant tolerance to heat, cold, and salt stress.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.conwedfibers.com/futerra.html

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Growth Stimulant contains cold water processed Ascophyllum nodosum (seaweed extract). It stimulates plant top growth of turf grasses, increases root mass of plant, and enhances plant tolerance to heat, cold, and salt stress.

Erosion Control Products Fact Sheet
Hy-Tex MulchMat

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Natural fiber weed control mat.

No graphic available

Hy-Tex MulchMat

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Smooth or scalp planting area, install container plant, install mulch mat on ground surface, secure with staples or pins.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Unlike many other 'natural fiber' products MulchMat™ is made purely from natural fibers and does not contain synthetic retaining nets or backing sheets - which are a potential snagging and ingestion risk to wildlife. The subtle faun colour of MulchMat™ blends well with surrounding ground, so does not require any disguising top dressing.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Weed or replace as needed.

Maintenance Staffing/Equipment:

Laborer

Maintenance Level of Effort:

Low

Constraints:

Weeds can grow into mat when soil and/or seed is placed on top of the mat.

Advantages:

Natural fiber blanket supresses weeds during early establishment period of plantings and does not need to be removed once plant is established.

Contact Information:

Distributor:

Website

Manufacturer:

Hy-Tex Ltd
PO Box 97
Aldington, ASHFORD, Kent, England TN25 7EA
+44 (O) `122 720097

Email

Website

http://www.hy-tex.co.uk/ht_bio_gm.html

Manufacturer's/Distributor's Comments:

Hy-Tex MulchMat™ is a tough, natural fibre blanket, which offers an environmentally desirable method for temporary weed suppression. The dense, reinforced and tightly bound construction of MulchMat™ provides and effective barrier against weed penetration during the critical first years of planting scheme development. MulchMat™ also offers a beneficial environment for rapid and health plant growth - suppressing competitive weed growth, providing insulation and conserving ground moisture. In addition, MulchMat™ completely shelters the underlying bare surface from weather erosion while plants develop to provide long term protection. Unlike many other 'natural fibre' products MulchMat™ is made purely from natural fibres and does not contain synthetic retaining nets or backing sheets - which are a potential snagging and ingestion risk to wildlife. The subtle faun colour of MulchMat™ blends well with surrounding ground, so does not require any disguising top dressing.

Erosion Control Products Fact Sheet
Hydretain

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment. Chemicals attract water moisture from air and make available to plants.

Hydretain

Erosion Control Function:

Improves plant growth for soil stabilization.
"The compounds in Hydretain® are attracted onto the root system which then mine the soil of water vapour. "

Caltrans BMP ID

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Dosage of Hydretain® for turf use
General Maintenance (every 6-8 weeks) 500ml/100m2
Seeding & Solonizing 1L/100m2
Sodding 500ml/100m2
With Soil wetter (every 4-6 weeks) 250ml/100m2

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

pH (concentrate) 5.5 - 6.8
538 g/L organic humectants
219 g/L organic soil surfactants

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Reduces watering requirements.

Contact Information:
Distributor:

Terra Firma Industries
6085 Zenith Court, NE
Rio Ranch, NM 87124
888 908-9222

Website

Manufacturer:

Organic Crop Protectants

Email

Website

http://www.ocp.com.au/products/Hydretain.htm

Manufacturer's/Distributor's Comments:

Hydretain is a revolutionary new chemistry designed to reduce the watering requirements of turf. Its blend of hygroscopic and humectant compounds attracts and holds free water molecules from the air within the soil matrix. It efficiently transfers them into the roots of turf. This simple mechanism will result in healthy, vigorous, drought-resistant turf.

Erosion Control Products Fact Sheet
HydroGel

Caltrans
New Technology Report

Description:

Soil/plant amendment.
HydroGel is a polymer that is able to store water and nutrients up to 500% its own size and weight. Aids in plant establishment. Soil amendment.

No graphic available

HydroGel

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Follow manufacturer's specifications.
Application rate: about 10.6 pounds per acre.
May be applied with hydroseeder.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Polymer

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Unknown

Maintenance Staffing/Equipment:

Unknown

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Improves water holding capacity of soils for plant uptake.

Contact Information:
Distributor:

Website

Manufacturer:

Finn Corporation
800 543-7166

Email

Website

http://www.finncorp.com

Manufacturer's/Distributor's Comments:

HydroGel is a polymer that is able to store water and nutrients up to 500% its own size and weight. Once HydroGel releases its stored moisture and nutrients to the root system, it will replenish itself with the next rainfall or irrigation. HydroGel comes in two types of polymers: HydroGelB for turf related soils, and HydroGelC for plants, shrubs, and trees.

Erosion Control Products Fact Sheet
Hydromax

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment consisting of plant hormones and vitamins improves plant germination and growth, also helps bind soil particles in coarse texture soils.

No graphic available

Hydromax

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Follow manufactuer's recommendations. Add to hydromulch mix: approximately 660 oz. per acre.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Finn HydroMax consists of plant hormones and vitamins, which stimulate earlier germination and root development. Also included are the beneficial bacteria and microbes.

Construction Complexity: Low

Ancillary Facilities:

Apply with hydroseeder on large areas.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

None

Maintenance Staffing/Equipment:

NA

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to mix with hydromulch slurry. Improves soil structure and nutrient availability for improved plant growth.

Contact Information:
Distributor:

Website

Manufacturer:

Finn Corporation
800 543-7166

Email

Website
http://www.finncorp.com

Manufacturer's/Distributor's Comments:

Finn HydroMax consists of plant hormones and vitamins, which stimulate earlier germination and root development. Also included are the beneficial bacteria and microbes. They are very effective in areas where the soil has been exposed to high levels of environmental/ mechanical stress that suppresses the natural microbial functions of the soil. And the final ingredient is humic acid, which is a soil amendment that benefits various types of soils. On sandy soils it actually gives the soil particles a negative (-) charge, thus creating molecular attraction between positive nutrients and negative soils. In heavy clay and compacted soils the humic acid creates a microscopic aerification that allows oxygen, moisture, and nutrient penetration, all of which promote a healthier plant. A major problem with any type of seed application is the leaching and availability of nutrients when the seed actually germinates and root development takes place. Quite often due to watering practices, the fertilizer has already leached through the soil before the seed has even germinated. With the addition of humic acid, leaching of nutrients and moisture are greatly reduced, and sod like results are achieved in 3 to 4 weeks

Erosion Control Products Fact Sheet
Kiwi Power

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Enzymes, biostimulant, wetting agent, decompacting soil amendment

Kiwi Power

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Apply five gallons Kiwi Power liquid concentrate per acre. Water in with 1,000 gallons water per acre to achieve uniform distribution. For specific application instructions, refer to label.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long term effectiveness will vary with plant type.

Specifications (Product Data):

Kiwi Power is safe and easy to use. It is biodegradable, non-polluting, non-flammable, and non-toxic. This non-plant food complex contains:

Spirostant (Organic Wetting Agent) 20.00%
Pargenin (Organic Enzymes) 15.62%
Sarsapogenin (Organic Bacterial Activator) . 15.52%
Sarsaponin (Organic Surfactant Agent) 10.00%
Humic Acid (Organic Enzymes) 10.00%
Sulfur (Organic Enzymes) 2.00%
Copper Sulfate (Organic Enzymes) 1.00%
Cytokinins (Biostimulants) 0.25%
Inert Ingredients 25.61%

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Construction Complexity: Low

Ancillary Facilities:

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as needed.

Maintenance Staffing/Equipment:

Laborer.

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improves soil structure and microbial activitiy.

Contact Information:

Distributor:

Website

Manufacturer:

Quattro Environmental, Inc.
649 'I' Avenue
Coronado, CA
619 522-0044

Email

Website

http://www.kiwipower.com/

Manufacturer's/Distributor's Comments:

Softens & Loosens Soil
Kiwi Power softens and flocculates hard, compacted seed beds:
Organic bacterial activator biocatalytically breaks down compacted soils by causing the soil to flocculate. Flocculation opens up the soil for greater movement of air and water. Organic surfactant weakens the ionic bonding of soil particles and converts the calcium carbonates and chlorides present in alkaline soils into elemental calcium and carbon dioxide. Organic enzymes increase the cation exchange capacity of the soil by releasing hydrogen radicals. A high cation exchange capacity is essential to a loose soil with a good capillary moisture environment.

Unleashes Nutrients
Kiwi Power's microorganisms activate "locked-up" nutrients:
Microbial action builds a balance of humus, enzymes and beneficial bacteria that slowly releases dormant nutrients in a plant available form. Organic bacterial activators increase plant uptake of fertilizers and nutrients. Cytokinins, a growth hormone, stimulates and accelerates root growth.

Increases Water Penetration
Kiwi Power improves water penetration/retention:
Organic wetting agent and organic enzymes improve water penetration and increase the moisture-holding capacity, the cation exchange and the capillary moisture movement of the soil. An improved percolation rate of the soil diminishes erosion and water loss through runoff. Sarsaponin, a desert plant extract, reduces stress in hot, dry conditions. Stress is also reduced by making water and nutrients more readily available, and by facilitating greater root growth and penetration.

Erosion Control Products Fact Sheet
Menefee Humate

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment. Humic substances, food source for microorganisms unlocks unavailable nutrients in the soil.

No graphic available

Menefee Humate

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Soil testing and analysis is recommended prior to the application of nutrients, humate, and growth stimulants. Obtaining a soil analysis from an approved soil laboratory verifies a soil's nutrient composition, assuring that all macro and micro-nutrients are in proper concentrations and balance. pH, soluble salts, and organic matter indexes should be analyzed in conjunction with nutrient analysis.
Application rates vary from 220 to 435 pounds per acre depending on soil anaylysis.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Physical and Biochemical Characteristics of Menefee Humate:
Bulk Density: ± 2,000 pounds per cubic yard
pH Range: ~ 3.23 - 3.5
Humic Acid Equivalent: Minimum 35% to Maximum ~ 80%
C.E.C. Value: 26 meq/100 g
E.C. Value: .34 mmhos/cm

See manufacturer's website or product data sheet for more imformation.

Construction Complexity: Low

Ancillary Facilities:

Broadcast granular form with agricultural equipment. Spray water soluble form with hydroseeder.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Manufacturer recommends biannual application in some situations.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to reapply.

Maintenance Level of Effort:

Low

Constraints:

Soil analysis required for proper specification.

Advantages:

Easy to apply, improves plant germination and growth by improving soil microbial activity and structure.

Contact Information:
Distributor:

Website

Manufacturer:

Sundine Enterprises
5325 Garland Street
Arvada, CO 80002-2941
800 830-4261

Email

inquiry@sundine.com

Website

http://www.sundine.com

Manufacturer's/Distributor's Comments:

We carry Menefee Humate in Granular and water-soluble forms. This humate contains a high consistant level of humic substances, is a food source for microorganisms and is efficient in unlocking unavailable nutrients in the soil, making them available to your plants. Unlike many humates, Menefee humate is not clay based but rather sand based. The use of Menefee humate is extremely beneficial for the quick establishment and germination of plants and is used when seeding, sodding, hydroseeding, golf greens, tees, fairways, parks, and sports fields.

Erosion Control Products Fact Sheet
Mulching Granules

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Dry mulch granules.

Mulching Granules

Erosion Control Function:

Additives to increase effectiveness of hydroseed/hydromulch application.

Caltrans BMP ID
M

SWMP Category
II: Temporary
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Apply by hand or with a spreader. Prepare seed bed, apply seed and fertilizer to soil. Cover seeded area with mulching granules.

Application rates: 5:1 TO 3:1 SLOPE 75 LBS / 1000 SQ FT
GREATER THAN 3 :1 SLOPE 100 LBS / 1000 SQ FT

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
High

Notes:

Correct application rate per product is critical.

Specifications (Product Data):

CELLULOSE FIBER: 54.5% +-2
WOOD FIBER: 20% +-5
CLAY: 15% +-2
ORGANIC TACKIFIER: .5% +-2
MARKER DYE: Trace
WATER HOLDING CAPACITY: 400% Min

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Limited to slopes less than 1v:2h.

Advantages:

Does not require specialized equipment - can be hand broadcast or mechanically broadcast.

Contact Information:
Distributor:

Terra-Mulch, Profile Products LLC
750 Lake Cook Road, Suite 440
Buffalo Grove, IL 60089
847 215-3427

Website

http://www.terra-mulch.com

Manufacturer:

Email

Website

Manufacturer's/Distributor's Comments:

Mulching Granules are completely weed free. They reduce soil erosion, water runoff, and soil surface evaporation. Apply by hand or with a spreader. It is easy and inexpensive to use, as well as convenient to store and handle. University tested and proven to out perform paper mulch pellets.

Erosion Control Products Fact Sheet
Rubberiffic Mulch

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Synthetic mulch made from recycled tires.

Rubberiffic Mulch

Erosion Control Function:

Improves plant growth for soil stabilization. Protects soil surface from rainfall impact.

Caltrans BMP ID
Mulching

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

The best way to install Rubberific Mulch is by first applying felt, then spreading Rubberific Mulch 1.5" thick.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Made from 100% recycled rubber truck tires.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Some weeding may be required. Replace as needed.

Maintenance Staffing/Equipment:

Laborer.

Maintenance Level of Effort:

Low

Constraints:

Bulky - application over large areas may be labor intensive.

Advantages:

Using recycled materials has off-site environmental advantages.
Long lasting.

Contact Information:
Distributor:

Website

Manufacturer:

International Mulch Company
3585 Tree Court Industrial Blvd
St Louis, MO 63122
866 We Mulch (936-8524)

Email

sales@rubberifficmulch.com

Website

http://www.rubberificmulch.com/

Manufacturer's/Distributor's Comments:

Made from 100% recycled rubber truck tires, Rubberific Mulch's most attractive feature is its longevity. It surpasses conventional mulches, which need annual replacement, by lasting ten years without showing its age. Good for the environment and long-lasting to boot.

The mulch was created to help keep your landscape fresh looking year round without the hassle and costs of re-mulching every 6 months to a year. Several years of research resulted in this non-toxic, environmentally safe product that stays fresh looking for many years.

Rubberific Mulch is made from 100% recyclable tires. The product has been tested and approved by the Environmental Protection Agency, so it is safe for landscaping use. This product has also been approved by the United States Consumer Product Safety Commission for the use on playgrounds; they deemed this the safest material as it has the best fall rate of any surfacing.

Erosion Control Products Fact Sheet
Seanure SOILBUILDER

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment from England that promotes biological activity at the root zone.

No graphic available

Seanure SOILBUILDER

Erosion Control Function:

Improves plant growth for soil stabilization. Increases biological activity in the root zone. Works especially well in conditions where topsoil has been depleted (cut slopes) or in sandy soils. Enhances the growth and establishment of plant cover which provides the long term erosion control function.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type and soil texture.

Specifications (Product Data):

Composted seaweed - Ascophyllum nodosum.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Contact Information:

Distributor:

Website

Manufacturer:

Alginure Products
Stone Hill, Egerton, ASHFORD, Kent
England, TN27 9DU
44 (0)1233 756241

Email

alginure@alginure.co.uk

Website

http://www.alginure.co.uk/land-reclamation.html

Manufacturer's/Distributor's Comments:

SEANURE SOILBUILDER provides an immediate food source to stimulate bacterial and fungal life and to create and sustain necessary biological activity. It has a beneficial effect on soil particle aggregation, clay flocculation, and moisture.

SEANURE SOILBUILDER encourages soil bacteria, contains all essential trace elements, enhances water retention, reduces fertiliser leaching, increases leaf chlorophyll, improves plant health and resilience, and builds soil structure.

Erosion Control Products Fact Sheet
Sod Crystals

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Crystals added to soil absorb water and release it to plants between irrigations. Soil amendment.

Sod Crystals

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Application Rates:
A. Sod: 150 - 450 lbs / acre *
B. Seed: 150 - 450 lbs / acre *
* Broadcast on ground & work in 2" - 3" deep.
C. Potting Soil: Mix completely into dry soil at the following rates:
Container Size: SOD CRYSTALS
1 gal: 1 ounce
5 gal: 2 ounces
20 gal: 8 ounces

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Polymer
PHYSICAL PROPERTIES:
Appearance: White & brown granules
Weight (dry product): 5 lbs. / gal.
Stability (dry product): 5 years
Stability (in solution): 7-10 days
Odor: Odorless

Construction Complexity: Low

Ancillary Facilities:

Designed to be broadcast directly on the ground.

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

May need to reapply after 5 years.

Maintenance Staffing/Equipment:

Laborer

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improve soil water holding capacity for plants.

Contact Information:
Distributor:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340
770 303-0878

Website

http://www.herculesenvironmental.com/sod.html

Manufacturer:

Hercules Environmental Inc.
6596 New Peachtree Rd.
Doraville, GA 30340

Email

hercenv@herculesenvironmental.com

Website

http://www.herculesenvironmental.com/sod.html

Manufacturer's/Distributor's Comments:

PAM:
SOILOC - SOD CRYSTALS is a super absorbent polymer. It is supplied in a dry crystal for easy spreading. When watered the crystal swells & absorbs over 300 times its weight in water. ENVIRONMENTALLY FRIENDLY: NON-TOXIC TO PLANTS & ANIMALS - NON-CORROSIVE - CONTAINS NO CALCIUM CHLORIDE.

2.0 INTENDED USE:

SODDING, SEEDING, POTTING SOIL, PLANTING BEDS, TREE PLANTING SOILOC - SOD CRYSTALS is designed to be broadcast directly on the ground. When water is applied the crystals swell up acting like a water reservoir for the root zone. As the soil dries the crystals release the water to the roots. Extends watering cycle up to 50%. Lasts approx 5 years in the soil.

Erosion Control Products Fact Sheet
Stockosorb

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment. Polymers designed to improve capability of soils to hold water and nutrients, thus making them available to plants.

Stockosorb

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Application rate for hydromulching: 50 lb./acre

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Chemical Basis: Crosslinked potassium polyacrylate/polyacrylamide copolymer
Physical Form: White granules
Particle Size/Distribution:
Stockosorb S 200-800 microns
Stockosorb M 800-2000 microns
Stockosorb C 2000-4000 microns
Stockosorb 400 RD 100-800 microns
Bulk Density: 540 +/- 40 kg per cubic meter
pH value: 5.5 - 6.0
Moisture Content: 5% (+/-2%)

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Maintenance Staffing/Equipment:

Maintenance Level of Effort:

Low

Constraints:

Advantages:

Reduces watering requirements.

Contact Information:

Distributor:

Terra Firma Industries
6085 Zenith Court, NE
Rio Ranch, NM 87124
888 908-9222

Website

Manufacturer:

Email

Website

http://www.stockosorb.com

Manufacturer's/Distributor's Comments:

Stockosorb is a series of organic polymers specifically designed to improve the capability of soils to hold water and plant nutrients in horticultural applications. Upon contact with water, the polymer crystals swell, absorbing hundreds of times their weight. Plant roots grow through the polymers, where they are then able to extract the stored water and nutrients as needed. This controlled release of water and nutrients aids plants in achieving optimal moisture conditions for maximum plant growth.

Erosion Control Products Fact Sheet
StrawNet

Caltrans
New Technology Report

Description:

Soil/plant amendments.
Pelletized straw combined with binding agents. Weed free due to processing. Straw mulch.

No graphic available

StrawNet

Erosion Control Function:

Improves plant growth for soil stabilization.
Acts like straw. Pellets open up after first rain/irrigation.
Controls sediment loss by absorbing energy of rain.

Caltrans BMP ID
SS-6

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

In pellet form, StrawNet can be applied easily in any number of ways. For small spot repairs Straw Net can be applied directly by hand. For seeding projects of a few thousand feet or more, a walk-behind mulch spreader should do the trick. For larger projects involving a few acres, a three-point hitch spreader is suggested. Manufacturer suggests 100 lbs/1000 sf or .5 kilos/sq meter.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Compressed straw fibers are formed into easily applied pellets that weigh more than conventional straw so they can't be blown around. Add water and the pellets swell and rupture forming a thin but dense ground cover. Special binding agents have been added during production to help the straw fibers net together with themselves and the soil creating a moisture trapping layer of straw fiber. This layer will provide a barrier from wind and evaporation while allowing water to infiltrate for ideal seed germination. Available in: 50 lb. bags, 40 bags per pallet and 2,000 lb totes for large projects.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Unknown

Issues and Concerns

Maintenance Requirements:

Repair and reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to apply.

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply and will not blow away like straw.

Contact Information:
Distributor:

Website

Manufacturer:

Pelletized Straw, LLC
3676 W 9000N Road
Manteno, IL 60950
800 545-1755

Email

info@strawnet.com

Website

http://www.strawnet.com/form.asp

Manufacturer's/Distributor's Comments:

Compressed straw fibers are formed into easily applied pellets that weigh more than conventional straw so they can't be blown around. Add water andthe pellets swell and rupture forming a thin but dense ground cover. Special binding agents have been added duringproduction to help the straw fibers net together with themselves and the soil creating a moisture trapping layer of straw fiber. This layer will provide a barrier from wind and evaporation while allowing water to infiltratefor ideal seed germination. StrawNet...all theperformance of straw in an easy to apply, easy to store pellet.

Because StrawNet has eight times greater bulk density than conventional straw the blowing problems related to straw are completely eliminated. Additionally, special binding agents have been added to StrawNet to actually net the straw fibers together. This netting effect not only bonds the straw with itself but with the soil surface below forming a moisture absorbing barrier between the soil and environment.

Erosion Control Products Fact Sheet
TeraFlo

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Composition: Liquid Copolymer, surfactants, Micro-nutrients, Sulfates, Sodium asrylate.

No graphic available

TeraFlo

Erosion Control Function:

TeraFlo™ encapsulates all water molecules and holds water in the root zone for long periods of time before leaching away. Performs other functions to enhance plant growth which ultimately keeps soils in place.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Fill
Cut

Status
Approved Case by Case

Installation/Application:

Turf grass: Spray Surface (10,000 sq ft) 1 gal per 40 gal water. Sod (Prior to or post application): 4 gallons per acre. A 40:1 water to TeraFlo® mixture will ensure proper distribution when spraying or when used in irrigation systems. Thoroughly agitate before spraying.

Effectiveness:

Medium

Confidence Level of Effectiveness Rating:
Low

Notes:

Specifications (Product Data):

Active Ingredients: Liquid acrylamide copolymer, humecants and sulfates - 50% by weight. Inert Ingredients - 50% by weight.

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improves plant growth.

Contact Information:
Distributor:

Website

Manufacturer:

The Terawet Corporation
10387 Friars Road
San Diego, CA 92120
619 516-0130

Email

jpabt@terawet.com

Website

http://www.terawet.com/

Manufacturer's/Distributor's Comments:

TeraFlo™ encapsulates all water molecules and holds water in the root zone for long periods of time before leaching away. This reduces water cycle application by 25% to 50% when applied by sprinkler or drip methods.

TeraFlo™ prevents the buildup of soluble sodium salts contained in fertilizers and water sources, reducing salt stress conditions. Continual use of TeraFloÔ will keep the root zone free of salts.

TeraFlo™ reduces water friction allowing for rapid water penetration and filtration into any soil condition; hardpan, compacted or otherwise.

TeraFlo™ provides immediate relief from localized dry spots.

TeraFlo™ holds all additives (pesticides, insecticides, nutrients, etc) in the root zone preventing rapid leaching of these products. This increases their effectiveness and reduces over all application quantities making additive usage far more cost effective.

TeraFlo™ has a special affinity to nitrates keeping them in the root zone longer resulting in faster growing, greener grass and plants.

TeraFlo™ draws moisture from the humidity in the air and off the surface of the soil or grass and draws it down into the root zone allowing for a moisture source not previously available.

TeraFlo™ causes water to flow evenly throughout the soil profile without retaining excessive moisture
that causes fungi.

Erosion Control Products Fact Sheet
TeraGel

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Potassium-based copolymer crystals that absorb water then release the moisture to the plant upon demand.

No graphic available

TeraGel

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Spread one-half the crystals throughout the planting hole (not just on the bottom) and amend the backfill with the other half. Plant tree and replace with amended soil. Water liberally to activate the crystals.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.
This product does not appear on TeraWet's website.

Specifications (Product Data):

This crystal is characterized by its size, gel strength and depth of use or its ability to absorb under soil pressure. Its appearance is similar to rock salt and has a range of crystal sizes from 800 to 2000 microns.

It has high gel strength but slightly slower absorption speed due to the larger size crystals. It is ideally suited for compacted or hard clay soils, high traffic areas such as grass and deeper root zones such as trees and shrubs. The hydration cycle creates pore spaces and results in better aeration and drainage throughout the soil profile.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to apply.

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Absorbs water and releases to plant. It is ideally suited for compacted or hard clay soils. Easy to apply.

Contact Information:

Distributor:

Website

Manufacturer:

The Terawet Corporation
10387 Friars Road
San Diego, CA 92120
619 516-0130

Email

jpabt@terawet.com

Website

http://www.terawet.com/

Manufacturer's/Distributor's Comments:

Erosion Control Products Fact Sheet
TurfMedic

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment assists plants to absorb nutrients.

TurfMedic

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Application method: If injection unit is not available, surface application can be performed by sprayer, drip irrigation, overhead sprinklers, pipe flow, ditch head and fertigation systems.

Application rates: Four gallons per acre or 12 ounces per 1000 square feet for turf application. For AG application rate see AG rate table. It is recommended that 6 gallons per acre be used when treating heavy sand-based soils. No limitation on repeated applications.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Active ingredients: 70% by weight: Liquid linear copolymer, natural sugars, humectants, trichoderma, beneficial microbes, trace amounts of vitamin A, biotin, niacin, pantothenic acid, riboflavin, thiamine, fluvic acid, humic acid, manganese chelate, iron chelate, ascophyllum nodosum, yucca schidigera, vitamin B complex, vitamin K, vitamin C, biotin, N^2 fixing bacteria, phosphorus soluablizing bacteria.
Inert ingredients: 30% by weight.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as needed.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to apply.

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improves plant growth.

Contact Information:
Distributor:

Website

Manufacturer:

The Terawet Corporation
10387 Friars Road
San Diego, CA 92120
619 516-0130

Email

jpabt@terawet.com

Website

http://www.terawet.com/

Manufacturer's/Distributor's Comments:

Turf Medic™ is a unique formulation of ingredients that assists in the rapid absorption of nutrients by the stressed plant allowing for a more rapid recovery. Results can be seen in just days after application. Several weeks after application the plant or grass will be much more vigorous with improved root structure and a greener, healthier foliage.

Erosion Control Products Fact Sheet
Vert-Expert

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil conditioner used in hydroseeding. Increases plant nutrient uptake and soil microbial activity. European.

Vert-Expert

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Add to hydroseed mix as per manufacturer's specifications.
Application rates: 500 to 1500 kg/ha

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

100% plant based organic-mineral fertilizer in powder or pellet form specifically for hydroseeding operations.

Advantages: activation of the rhizosphere, mycorrhiza. Slow release.

Use: projects subject to severe climatic and edaphic constraints.

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Reapply as needed.

Maintenance Staffing/Equipment:

Laborer

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Slow release organic fertilizer. Activation of the rhizosphere, mycorrhiza for long term plant growth and establishment.

Contact Information:
Distributor:

Euro-Tec
130 Avenue St-Exupéry
BRON, France 69500
33 4 72 78 84 90

Website

http://www.euro-tec.fr/fixategb.htm

Manufacturer:

Email

Website

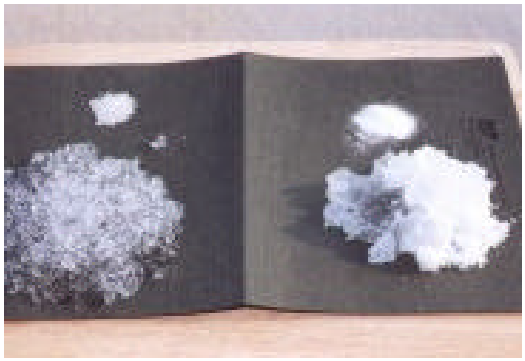
Manufacturer's/Distributor's Comments:

Erosion Control Products Fact Sheet
WaterSave

Caltrans
New Technology Report

Description:

Soil/plant amendment.
Soil amendment, polymer added to soil to absorb and store water.



WaterSave

Erosion Control Function:

Improves plant growth for soil stabilization.

Caltrans BMP ID
None

SWMP Category
IB: Permanent

Caltrans Slope Type
Cut
Fill

Status
Not approved

Installation/Application:

Revegetation 8 lbs./ 1000 sq. ft. area. Evenly broadcast dry and work into 2-3" deep. applications 2 lbs. / 100 L. ft.

Effectiveness:

Low

Confidence Level of Effectiveness Rating:
Low

Notes:

Long-term effectiveness will vary with plant type.

Specifications (Product Data):

Chemical Basis: Crosslinked potassium polyacrylate/polyacrylamide copolymer
Physical Form: White granules
Bulk Density: 540 +/-40 kg/cubic meter
PH value: 5.5 - 6.0
Moisture Content: 5% (+/- 2%)
Storage: > 1 year under dry storage conditions

Construction Complexity: Low

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Rocky
Not rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

None

Maintenance Staffing/Equipment:

NA

Maintenance Level of Effort:

Low

Constraints:

Unknown

Advantages:

Easy to apply, improves soil water holding capacity for plants uptake.

Contact Information:
Distributor:

Website

Manufacturer:

Rolanka
800 760-3215

Email

Website
http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

WaterSave potassium based polymers are remarkable, nontoxic, environmentally safe water management systems with excellent ability to absorb and store water. Ninety five percent of stored water is available to release gradually to plant roots as needed. WaterSave polymers are available in crystal (coarse and fine) and powder form (root dip).

Advantages
Increases water holding capacity and reduces irrigation frequency. WaterSave has the greatest capacity to absorb water under soil pressure. One ounce of WaterSave crystals can absorb about one gallon of water. Easy to use. Just mix with soil. No special tools required. Upon watering, the polymers absorb water and become a gel. Promotes healthy plant growth. Keep the root zone moist not water logged. Provides optimum conditions for plant root development and prevent root rot. Increases soil aeration. Expanding and contracting gel open passages in the soil and allows free flow of air and nutrients. WaterSave is a potassium-based rather than sodium-based polymer. Potassium is a nutrient required in plant development. WaterSave has a life span up to five years. WaterSave aids in the control of water run-off, prevents leaching of valuable water and nutrients from soil and reduces the fertilizer requirements. WaterSave is environmentally safe and does not contaminate plants, soils or ground water. It is essentially neutral in pH and can work over a wide range of pH.

Erosion Control Products Fact Sheet
BioD-Screen (biodegradable silt fence)

Caltrans
New Technology Report

Description:

Sediment barrier.
Coir silt fence

BioD-Screen (biodegradable silt fence)

Erosion Control Function:

Physically blocks the transport of sediment.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Material must be trenched into ground as per engineer's specifications, usually on contour. Support stakes are typically 8 feet apart, depending on conditions.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Woven from machine twisted bristle coir twines.
Height: 3 feet (0.91 m)
Length: 50 feet (15.2m)
Weight: 2.29 lbs/SY (1.25 kg/sq.m)

Construction Complexity: Medium

Ancillary Facilities:

Specialized installation equipment may improve effectiveness.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Often installed incorrectly. Trenches may impact sensitive areas. If not installed on contour, sheet water flow may concentrate following the fence trench and create gullies. May not be reuseable.

Advantages:

Non plastic, natural fibers are biodegradable.

Contact Information:

Distributor:

Website

Manufacturer:

Rolanka
800 760-3215

Email

Website

http://www.rolanka.com/

Manufacturer's/Distributor's Comments:

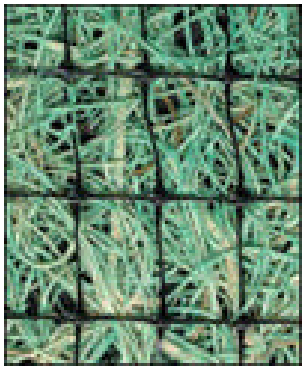
BioD-Screen biodegradable coir silt fence is woven from machine twisted bristle coir twines. Our closely woven matrix of BioD-Screen is strong, durable and biodegradable. The coir silt fence successfully filters run-off wter and retains large particles. It is the best silt fence for environmentally sensitive areas. BioD-Screen, coir silt fence will be available soon with versatile applications in sedimentation control.

Erosion Control Products Fact Sheet
Curlex® SiltTRAP

Caltrans
New Technology Report

Description:

Sediment barrier.
Silt trapping buffer strip (mat) made of excelsior fibers with polypropylene netting.



Curlex® SiltTRAP

Erosion Control Function:

Rough surface of mat catches sediment as sediment-laden waters pass over the material.

Caltrans BMP ID
None

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Curlex® SiltTRAP shall be located at the perimeter of the site along undisturbed vegetation, paved surfaces and/or the backside of curbs. Where large contributory areas or steep slopes are encountered, multiple strips may be required. Anchor with staples at the rate of one staple per yd2(m2). SiltTRAP shall not be installed for sediment capture purposes where concentrated flow conditions (channelized flow) from above are anticipated. Product may be enhanced by seeding.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria. Similar to erosion control blankets, only it is installed to collect sediment from overland sheet flows.

Specifications (Product Data):

SiltTRAP shall be a specific cut of 100% Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. Fibers shall be curled with soft barbs to allow for an interlocking matrix. The top of each blanket shall be covered with photodegradable polypropylene netting. SiltTRAP shall be free of weed seed with no chemical additives, and of consistent thickness, with fibers evenly distributed throughout the entire area of blanket. Excelsior color shall be QuickGrass® green.
Roll Dimensions: 4’ x 180’(1.2m x 54.9m)
8’ x 90’ (2.4m x 27.4m)
Roll Area: 80 square yards (67 sq.m)
Anchors: Steel wire staples - minimum of 6” (15cm)

Construction Complexity: Medium

Ancillary Facilities:

Disperse concentrated runoff away from product.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Plastic netting may become exposed and entrap animals. Netting may be caught in mowing equipment.

Advantages:

Lightweight, does not need to be removed if sufficient grass cover grows in it.

Contact Information:

Distributor:

Website

Manufacturer:

American Excelsior Company
Arlington, TX
800 777-7645

Email

Website

http://www.curlex.com

Manufacturer's/Distributor's Comments:

Material Characteristics
SiltTRAP offers a unique way if installing a temporary buffer strip to capture sediment before it washes away filling gutters, clogging pipes, killing fish and generally creating a mess. The unique Curlex excelsior fibers in SiltTRAP filter soil from the runoff and greatly reduce off site problems without trenching, staking, weed seeds, eyesores and disposal hassles. And, since SiltTRAP fibers are biodegradable, you can install it and forget it.

Curlex® SiltTRAP fibers expand when wet creating a 'clinging' effect to the soil, making the blanket become twice as thick, thereby adding additional protection during heavy rain. The same fibers then slowly release the absorbed moisture back to the soil creating a hygroscopic action, nurturing seed and promoting re-vegetation.

Erosion Control Products Fact Sheet
KoirFence

Caltrans
New Technology Report

Description:

Sediment barrier.
Coir silt fence acts as a filter as well as settling basin. Made of all natural materials.

No graphic available

KoirFence

Erosion Control Function:

Physically blocks the transport of sediment, allows some filtering of water.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Material must be trenched into ground as per engineer's specifications, usually on contour. Support stakes are typically 8 feet apart, depending on conditions.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria. Standard silt fences made of sythetics do not filter, only act as settling basins when they are installed correctly.

Specifications (Product Data):

Made of coconut (coori) fibers.
36" wide x 50' long rolls. Approximately 700 pieces per truckload.

Construction Complexity: Medium

Ancillary Facilities:

Specialized installation equipment may improve effectiveness.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Often installed incorrectly. Trenches may impact sensitive areas. If not installed on contour, sheet water flow may concentrate following the fence trench and create gullies. May not be reuseable.

Advantages:

Non plastic, natural fibers are biodegradable.

Contact Information:
Distributor:

Website

Manufacturer:

Nedia Enterprises
888 725-6999

Email

Website
http://www.nedia.com/

Manufacturer's/Distributor's Comments:

100% Biodegradable Silt Fence

1.100% natural, organic and biodegradble.

2.Effectively filters suspended soil particles from run-off water.

3.Stakes can be inserted through the integral coir twine loops.

4.High tensile strength.

5.Safe to our environment.

6.Easy to install.

7.Economic.

Standard Size 36" wide x 50' long rolls.

Approximately 700 pieces per truckload.

Erosion Control Products Fact Sheet
Mirafi Silt Fence

Caltrans
New Technology Report

Description:

Sediment barrier.
Synthetic silt fence.

Mirafi Silt Fence

Erosion Control Function:

Physically blocks the transport of sediment.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

With Trench: Excavate a 15.2 cm x 15.2 cm (6" x 6") trench along lower perimeter of site. Unroll silt fence one section at a time.Posts should be positioned on downstream side of fence. Drive post into ground and lay the toe-in fabric flap in bottom of trench. Backfill trench, and tamp ground.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

PROPERTY	UNITS
Grab Tensile Strength (machine direction):	(lbs) 550 (124)
Grab Tensile Strength (cross-machine direction):	(lbs) 550 (124)
Grab Tensile Elongation:	% 15/15
Mullen Burst Strength:	kPa (psi) 2060 (300)
Trapezoid Tear Strength:	(lbs) 290 (65)
Permittivity:	sec-1 0.10
Water Flow Rate:	l/min/m2 (gal/min/ft2) 405 (10)
Ultraviolet Stability:	% 70

Construction Complexity: Medium

Ancillary Facilities:

Specialized installation equipment may improve effectiveness.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Often installed incorrectly. Trenches may impact sensitive areas. If not installed on contour, sheet water flow may concentrate following the fence trench and create gullies.

Advantages:

Lightweight. Synthetic materials may be reused on other job sites.

Contact Information:

Distributor:

Website

Manufacturer:

TC Mirafi
365 South Holland Drive
Pendergrass, GA 30567
888 795-0808

Email

Website

http://www.tcmirafi.com/

Manufacturer's/Distributor's Comments:

Prefabricated Silt Fence Structures for Sedimentation Control
TC Mirafi® offers a wide range of woven and geotextiles for sedimentation control applications. These fabrics are cost-effective elements which improve and enhance modern construction techniques in a variety of civil engineering applications.

Product Description
Mirafi® Silt Fence structures, specially developed fabrics on supporting posts, are designed for efficient control of sediment run-off from construction sites. This sediment, left unchecked, can clog and pollute native waterways and damage natural areas. Controlling the run-off (an increasing environmental concern) is advantageous to owners, contractors and engineers who face the economic costs associated with site sediment loss. Installed correctly in the field, the sedimentation control fabric in silt fence structures functions as a filter and a run-off flow velocity check. Fine-grained sediment is trapped by the fabric while storm water run-off may pass through the fabric at a moderate rate.

Erosion Control Products Fact Sheet
Sedimat

Caltrans
New Technology Report

Description:

Sediment barrier.
In-stream silt control device. Used to collect the first flush of sediment in the stream channel. Use when dewatering a fish bearing stream. May be useful in ditches and swales, around drop inlets.

Sedimat

Erosion Control Function:

Rough surface of mat catches sediment as sediment-laden waters pass over the material.

Caltrans BMP ID
None

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Lay in channel, anchor in place.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

A patented in-stream sedimentation control device. Video and technical data available upon request.

100% biodegradable
4'x10' mat size

Construction Complexity: Medium

Ancillary Facilities:

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success.

Advantages:

Lightweight, easy to install.

Contact Information:
Distributor:

Website

Manufacturer:

Indian Valley Industries
P.O. Box 810 60-100 Corliss Ave
Johnson City, NY 13790-081
800 659-5111

Email

Website

http://www.iviindustries.com/sedimat.htm

Manufacturer's/Distributor's Comments:

A patented in-stream sedimentation control device.
Effectively used in stream crossings, culvert replacements, ditch maintenance and bridge work. Excellent first flush protection.
Prevents silt damage to stream beds. Protects oxygenated gravel. Easy to install. 100% biodegradable
Video and technical data available upon request.

Erosion Control Products Fact Sheet
Siltsack High Flow

Caltrans
New Technology Report

Description:

Sediment barrier.
Geotextile bag installs in catch basins beneath the drop inlet grate as a primary or secondary filter. High maintenance. Pollution filtration and silt control.

Siltsack High Flow

Erosion Control Function:

Physically blocks the transport of sediment.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Install Siltsack in catch basin, making sure emptying straps are laid flat, outside the basin and held in place by drain grate. Hold down removal flap pockets and emptying straps by covering with soil. Properly installed, Siltsack is out of sight and catches silt without the worry of silt fences or straw dams failing.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation and frequent maintenance is critical to meet effectiveness criteria.

Specifications (Product Data):

Property	Test Method	Test Results
Grab Tensile	ASTM D-4632	265 lbs.
Grab Elongation	ASTM D-4632	20%
Puncture	ASTM D-4833	135 lbs.
Mullen Burst	ASTM D-3786	420 P.S.I.
Trapezoid Tear	ASTM D-4533	45 lbs.
UV Resistance	ASTM D-4355	90%
Apparent Opening	ASTM D-4751	20 US Sieve
Flow Rate	ASTM D-4491	200 Gal/Min/Ft2
Permittivity	ASTM D-4491	1.5 sec -1

Construction Complexity: Medium

Ancillary Facilities:

Upstream slopes must be protected from erosion as much as possible as this is an end of the line sediment catchment device which is easily overwhelmed.

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

High maintenance. Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Must be checked and cleaned out frequently during the rainy season. May cause water to bypass inlet and enter stream system at an unprotected location.

Advantages:

Lightweight, simple installation.

Contact Information:

Distributor:

Website

Manufacturer:

ACF Environmental
2831 Cardwell Road
Richmond, CA 23234
800 448-3636

Email

Website

http://www.acfenvironmental.com/productline.asp?ProductID=19

Manufacturer's/Distributor's Comments:

Used to prevent silt and sediment from entering and clogging your drainage system, Siltsacks® are easily installed in catch basins beneath the grate as a primary or secondary filter.

Benefits:
Prevents contamination of stormwater run-off
Prevents Clogging of Drainage System
Virtually Invisible once Installed
Doesn't Prevent Water from Entering System
Easy to Install

Applications:
Can be Manufactured to Fit Virtually Any Catch Basin
Primary or Secondary Protection

Erosion Control Products Fact Sheet
Siltsack Regular Flow

Caltrans
New Technology Report

Description:

Sediment barrier.
Geotextile bag installs in catch basins beneath the drop inlet grate as a primary or secondary filter. High maintenance. Pollution filtration and silt control.

Siltsack Regular Flow

Erosion Control Function:

Physically blocks the transport of sediment.

Caltrans BMP ID
SC-10

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Install Siltsack in catch basin, making sure emptying straps are laid flat, outside the basin and held in place by drain grate. Hold down removal flap pockets and emptying straps by covering with soil. Properly installed, Siltsack is out of sight and catches silt without the worry of silt fences or straw dams failing.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation and frequent maintenance is critical to meet effectiveness criteria.

Specifications (Product Data):

Available in 2'x4' and 2'x2'

Property	Test Method	Test Result
Grab Tensile	ASTM D-4632	300 lbs.
Grab Elongation	ASTM D-4632	20%
Puncture	ASTM D-4833	120 lbs.
Mullen Burst	ASTM D-3786	800 P.S.I.
Trapezoid Tear	ASTM D-4533	120 lbs.
UV Resistance	ASTM D-4355	80%
Apparent Opening	ASTM D-4751	40 US Sieve
Flow Rate	ASTM D-4491	40 Gal/Min/Ft2
Permittivity	ASTM D-4491	0.55 sec -1

Construction Complexity: Medium

Ancillary Facilities:

Upstream slopes must be protected from erosion as much as possible as this is an end of the line sediment catchment device which is easily overwhelmed.

Location
Rural
Urban

Soil Category
Not rocky
Rocky

Steepness
Unknown

Cost: Low

Issues and Concerns

Maintenance Requirements:

High maintenance. Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Must be checked and cleaned out frequently during the rainy season. My cause water to bypass inlet and enter stream system at an unprotected location.

Advantages:

Lightweight, simple installation.

Contact Information:

Distributor:

Website

Manufacturer:

ACF Environmental
2831 Cardwell Road
Richmond, CA 23234
800 448-3636

Email

Website

http://www.acfenvironmental.com/productline.asp?ProductID=19

Manufacturer's/Distributor's Comments:

Used to prevent silt and sediment from entering and clogging your drainage system, Siltsacks® are easily installed in catch basins beneath the grate as a primary or secondary filter.

Benefits:
Prevents contamination of stormwater run-off
Prevents clogging of drainage system
Virtually invisible once installed
Doesn't prevent water from entering system
Easy to install

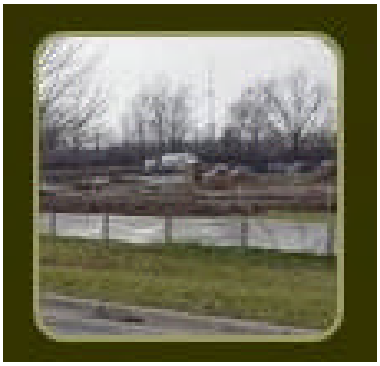
Applications:
Can be Manufactured to Fit Virtually Any Catch Basin
Primary or Secondary Protection

Erosion Control Products Fact Sheet
Silttrapper

Caltrans
New Technology Report

Description:

Sediment barrier.
Silt fence. Fabric 36" wide non-woven, continuous filament, needle-punched, geotextile fabric produced from 100% polypropylene



Silttrapper

Erosion Control Function:

Physically blocks the transport of sediment.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Dig 6" deep trench along proposed fence line (a trenching machine is needed on long runs.) Pound stake in trench 6"-8" or until secure. Be sure to stretch fabric taut when pounding stakes. Stakes must be installed on the downhill or downstream side of fence. Drape loose end of geotextile into trench. Backfill and compact soil on both sides. Install on contour or as per engineer's specifications.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

Fabric 36" wide non-woven, continuous filament, needle-punched, geotextile fabric produced from 100% polypropylene. Desired characteristics include a range of pore size, high UV resistance, high permittivity, and a high percent of open area.
Structure: Non-woven
Polymer: Polypropylene (ASTM D5261)
Weight: 136g / M2 (ASTM D5261)
UV Resistance: > 85% (ASTM D4355)
Permittivity: 6927-1 / min / M2 (ASTM D4491)
Trapezoidal Tear: 0.2 KN (ASTM D4533)
Grab Tensile/Elongation: 0.533 KN / 50% (ASTM D4632)
Puncture Resistance: 0.267 KN (ASTM D4833)

Construction Complexity: Medium

Ancillary Facilities:

Specialized installation equipment may improve effectiveness.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Often installed incorrectly. Trenches may impact sensitive areas. If not installed on contour, sheet water flow may concentrate following the fence trench and create gullies.

Advantages:

Lightweight. Synthetic materials may be reused on other job sites.

Contact Information:

Distributor:

Website

Manufacturer:

King Fibre Coirporation
1398 N. Shadeland Avenue Suite 2224

Indianapolis , IN 46219

Email

Website

http://www.kingfibre.com/products/silt.html

Manufacturer's/Distributor's Comments:

Materials
Fabric 36" wide non-woven, continuous filament needle-punched, geotextile fabric produced from 100% polypropylene. Desired characteristics include a range of pore size, high UV resistance, high permittivity, and a high percent of open area.

Stakes 2" x 2" x 36" hardwood with sharpen point, 6'-0" on center
Lath 1/2 " x 2" x 24" wood attached to stake to prevent fabric from tearing away.
Staples 1 1/2 " GS16
Lockstitch Reinforced BZT -207 Nylon, Bonded, 401 PP, continuous at top of fabric to prevent sag.
Denier 2301 (ASTM D5261)
Grab Tensile / Elongation 5.37 kg / 26.4 % Max. (ASTM D1907)

Erosion Control Products Fact Sheet
TerraTex Barrier Fencing 100

Caltrans
New Technology Report

Description:

Sediment barrier.
Silt fence.

TerraTex Barrier Fencing 100

Erosion Control Function:

Physically blocks the transport of sediment.

Caltrans BMP ID
SC-1

SWMP Category
II: Temporary

Caltrans Slope Type
Cut
Fill

Status
Approved Case by Case

Installation/Application:

Material must be trenched into ground as per engineer's specifications, usually on contour. Support stakes are typically 8 feet apart, depending on conditions. The fabric rolls can be easily attached to pre-set wooden or metal posts by using plastic ties or other fasteners.

Effectiveness:

High

Confidence Level of Effectiveness Rating:
Medium

Notes:

Correct installation is critical to meet effectiveness criteria.

Specifications (Product Data):

TerraTex Barrier FencingTM is constructed of a UV stabilized, safety orange fabric woven from polypropylene yarns. The pre-assembled fence has hardwood posts already attached to the TerraTex Barrier FencingTM with heavy duty industrial staples.
Dimensions:
Fabric Rolls - 48" x 300', 48" x 100'
Preassembled Fences - 48" x 100', 48"x 50'

Construction Complexity: Medium

Ancillary Facilities:

Specialized installation equipment may improve effectiveness.

Location
Rural
Urban

Soil Category
Not rocky

Steepness
Max. 1v:2h

Cost: Low

Issues and Concerns

Maintenance Requirements:

Frequent check for clean-out and repair.

Maintenance Staffing/Equipment:

Journeyman to inspect/laborers to repair.

Maintenance Level of Effort:

High

Constraints:

Correct installation is critical to success. Often installed incorrectly. Trenches may impact sensitive areas. If not installed on contour, sheet water flow may concentrate following the fence trench and create gullies.

Advantages:

Lightweight. Synthetic materials may be reused on other job sites.

Contact Information:
Distributor:

Website

Manufacturer:

Webtec, Inc. Geosynthetics
Charlotte, NC 28219
800 438 - 0027

Email

Website

http://webtecgeos.harborwebs.com/

Manufacturer's/Distributor's Comments:

Silt fence

The bright color of the fabric and laminated bands make the TerraTex Barrier FencingTM highly visible. TerraTex Barrier FencingTM is available pre-assembled or in fabric rolls.