Erosion Control
Solutions

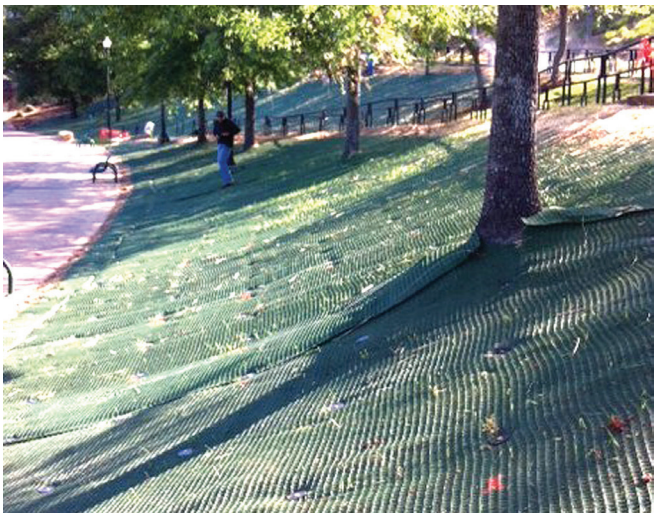
Applications

High-volume and high-velocity storm water runoff can erode soil within open channels, drainage ditches, swales and on steep exposed slopes increasing the transport of sediments into receiving waters that can severely affect water storage capacity and increase flooding potential. Water quality impacts of increased sediment load include the conveyance of nutrients and pesticide pollutants, disruption of fish spawning and impairment of aquatic habitat. Advanced Drainage Systems, Inc. is able to provide the products needed to protect against soil loss. In addition, ADS products are able to save the end user money and time.

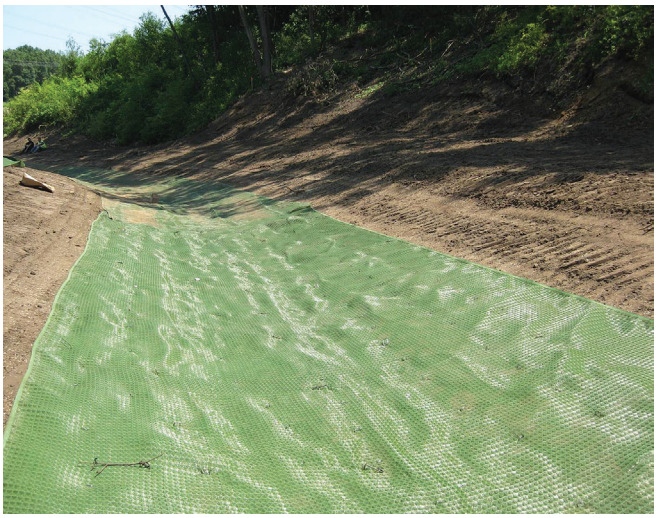
ADS erosion control products are able to protect newly seeded soils from raindrop impact, minimize soil loss and promote infiltration to accelerate the development of the seeds.

On slopes, ADS products are more effective than hydraulic mulch and blown straw and more economical than concrete slope paving or riprap.

ADS erosion control products also help to capture sediment and other contaminants from storm water. Permanent turf reinforcement mats enhance vegetation performance, resist erosion and tearing of vegetation under the highest water velocities.



Slope stabilization utilizing an armor system.



Woven turn reinforcement mat used for steep slope channel stabilization.

High-performance turf reinforcement mat with ultra-violet resistance for up to a 50-year design life in semi-arid conditions.

Erosion Control Blankets (ECBs)

Erosion control blankets are available in numerous varieties, including excelsior, straw, straw/coconut and coconut which are confined by nettings stitched together. ECBs hold soil and seed in place until the vegetative establishment. The blankets degrade over time as the permanent vegetative cover establishes itself.

OOS1TT
Weed-free agriculture straw that is bonded by a single synthetic, photodegradable top netting. It is an ideal solution for rainfall/rainsplash protection on shallow slopes.

OOS2TT
A single synthetic, photodegradable top and bottom netting is utilized in the OOS2TT. The blanket may be used in low-flow channels and moderate slopes.

OCS2TT
A combination of straw and coconut fibers with a polypropylene netting on the bottom and top has a two-year life span and can be utilized where long-term protection is needed and in medium runoff conditions.

OOC2TT
For use on steeper slopes and moderate flow runoff, the slow degrading coconut fibers are stitched on the top and bottom with polypropylene nets. Provides erosion protection and mulching between a 2-3 year period.

ALL NATURAL
All erosion control blankets are available with an all-natural netting created from Jute/Scrim Biodegradable for sensitive applications. These ECBs are ideal for environmental restoration with light to moderate water runoff conditions.

RAPID GO
Rapid Go blankets are utilized where vegetation will grow rapidly and then is followed by mowing or other maintenance activities. The netting has special additives to accelerate the photodegradation process. Typical applications for Rapid Go are parks and golf courses.

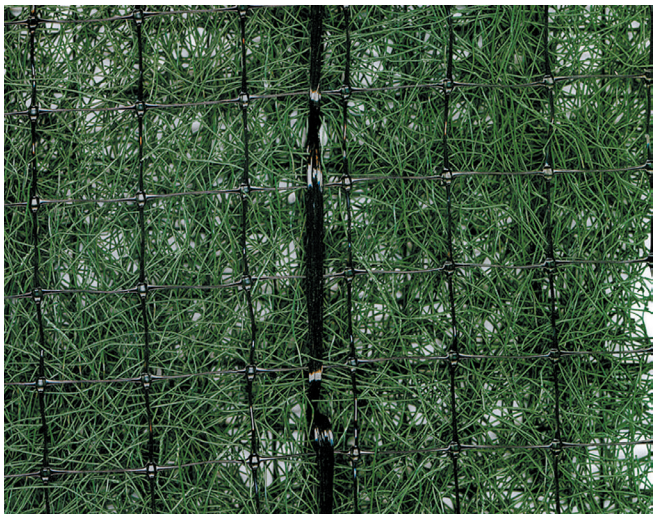
OOS1TT

OOC2TT

Turf Reinforcement Mats (TRMs)

When a permanent rolled erosion control product is needed to provide vegetation with two to three times its normal erosion protection, a turf reinforcement mat is used. TRMs are composed of permanent synthetic materials to provide immediate erosion protection, rapid vegetation growth and long-term erosion protection. TRMs are preferred environmental alternatives to hard armor in the protection of drainage ditches, open channels, steep slopes and detention basins.

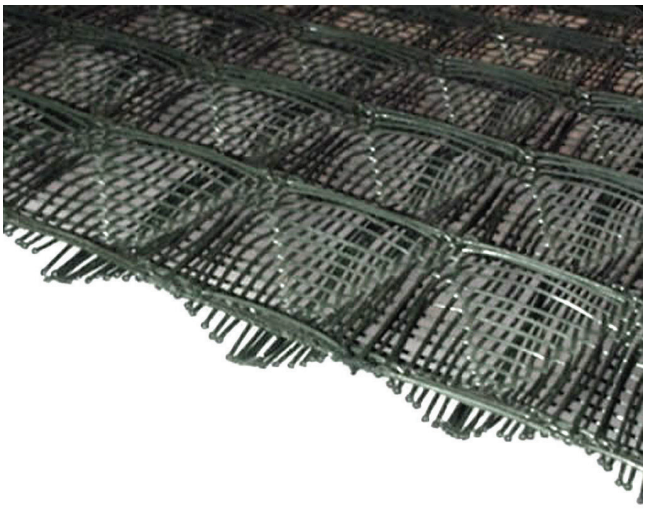
PP510GTR
Generally placed above a seeded surface and the first-generation TRM reinforces the vegetated root structure to resist higher hydraulic conditions. Two nets bond the web of green and tan polyolefin fibers and provides maximum erosion protection and vegetation growth through the mat. May be utilized for low flow swales, moderate slopes and ponds.



PP510GTR

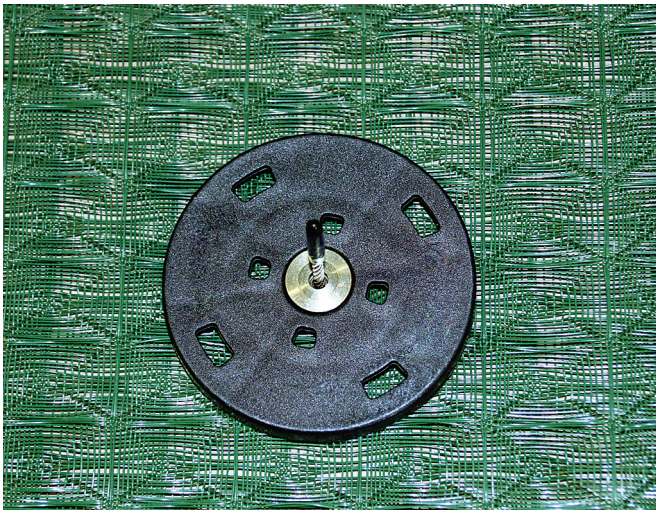
PP512GTR
A first-generation TRM, the PP512GTR allows soil filling and/or retention as well as plant emergence beneath or within the matrix of the green or tan polyolefin fibers. Two high-strength, biaxial-oriented nets hold the fibers in place.

PP5HPTRM
A second-generation HPTRM, the PP5 high-performance woven turf reinforcement mat, features both high tensile strength and a high tensile modulus to provide superior erosion protection from accelerated hydraulic forces and stands up to non-hydraulic stress conditions (maintenance activity). Offering a 50-year design life, it may be applied to channels, slopes, ponds and canal/river banks.



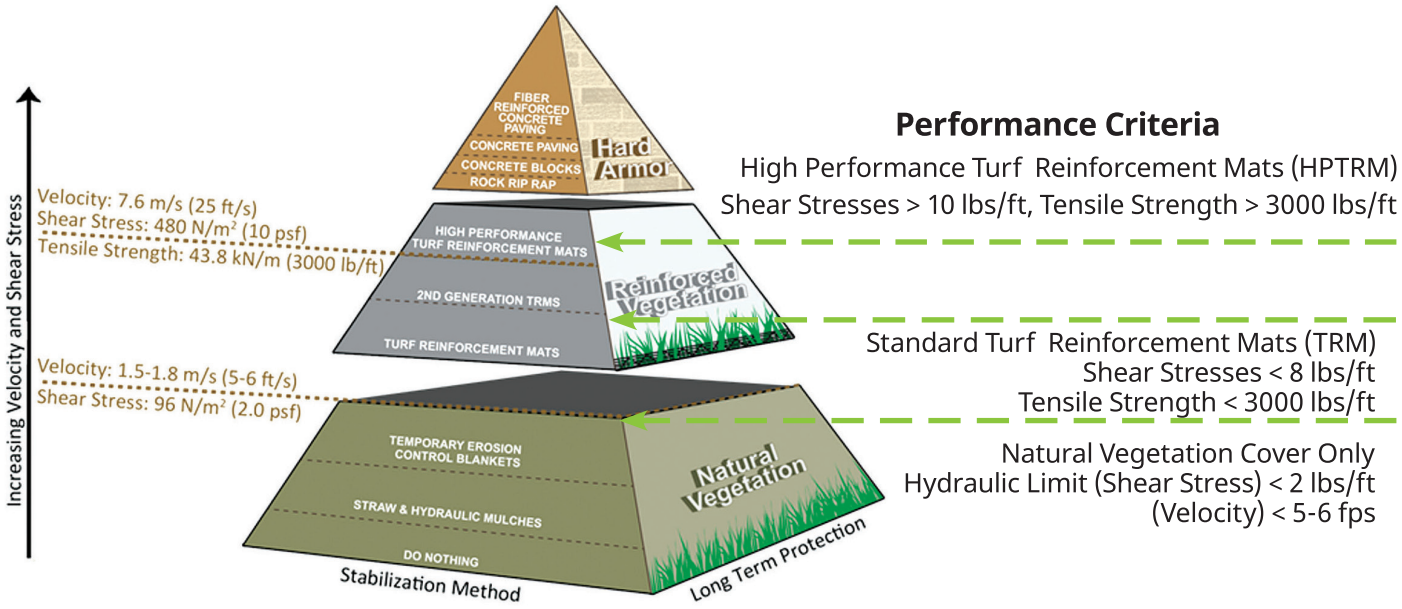
PP5HPTRM

PP5 ARMOR SYSTEM
An Anchored Reinforced Vegetation System (ARVS) consisting of the High Performance Turf Reinforcement Mat (HPTRM) in combination with Percussion Driven Earth Anchors (PDEAs). Installing the PDEAs with the HPTRM as a system allows for the strength of the HPTRM to be more effectively transferred to the ground surface reducing the potential for shallow plane failures due to poor in-situ soil conditions and/or strength loss due to seepage. Application consist of steep slopes, channels. river/ canal banks, retention/detention facilities, levee overtopping and/or where greater factors of safety are required.



PP5 Armor System

Measurable Benefits



Benefits

- Erosion control mats qualify as an EPA Phase II Best Management Practice, serving as part of an overall storm water management plan.
- Prevent sediment runoff
- Promote ground water recharge
- Reduce peak flows and runoff velocities
- Easy inspection and maintenance
- Safer and less costly than hard armor solutions

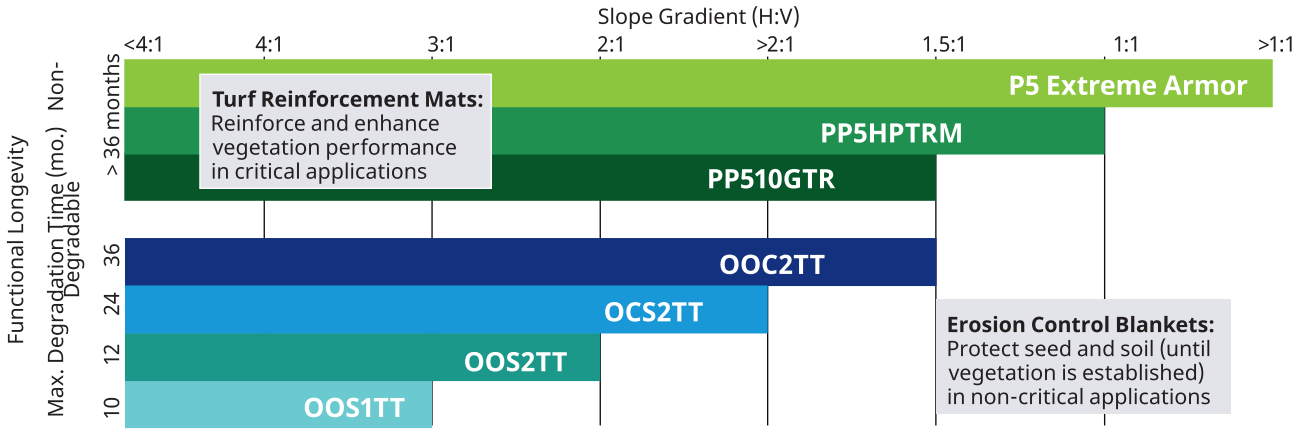
Effectiveness of Design Swales	
Pollutant	**Median Percent Removal**
Total Suspended Solids	81%
Oxygen Demanding Substances	67%
Nitrate	38%
Total Phosphorous	9%
Hydrocarbons	62%
Cadmium	42%
Copper	51%
Lead	67%
Zinc	71%

Pollutant Removal

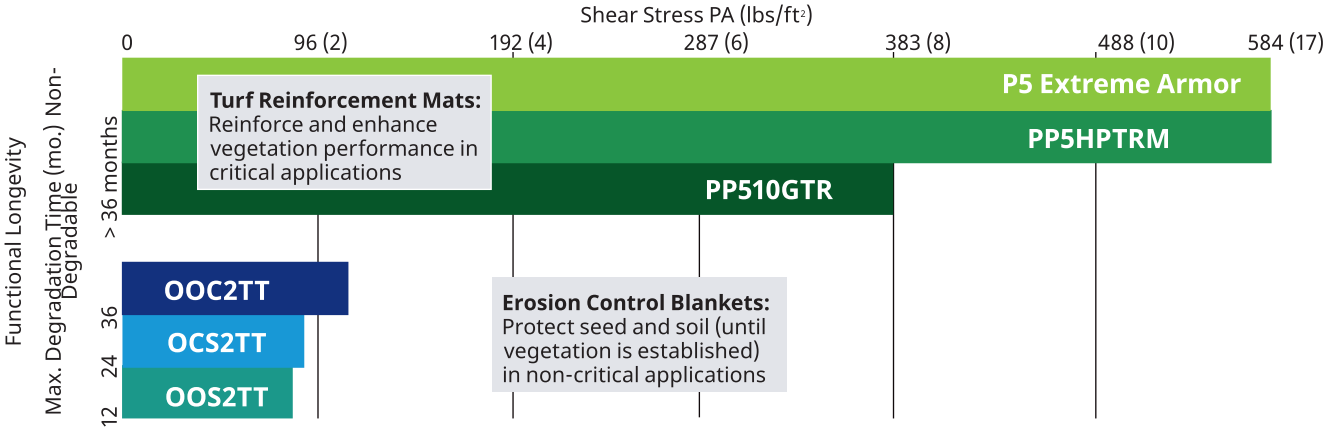
Studies done by the EPA show that grass swales and slopes with vegetation are effective in removing particulate pollutants. Conservative estimates are 25 to 50% pollutant removal efficiencies, but values ranging from 70-95% have been achieved on many sites.

Product Selection

Soil Slope Protection [1, 2, 3, 6]



Channel Lining Systems [1, 4, 5, 6]



NOTES:

1. Product suggestions shown are for initial selection of erosion control materials only. An experienced designer familiar with slope stability or channel design and lining material selection should make the final selection of the appropriate product. Consideration should be given to soil, geometry, vegetation selection, climate and irrigation conditions.
2. An important factor in erosion control material selection is slope length. For more information, please refer to the ADS EXCEL Erosion Design software or consult an ADS technical representative.
3. Where severe conditions are encountered and a long-term non-degradable material is needed, Xtreme Woven Technology Turf Reinforcement Mats should be selected. This selection chart is only applicable if soil slope is stable and upland surface water is not concentrated down slope.
4. An important component in channel lining is vegetation. Consult the Federal Highway Administration's Hydraulic Engineering Circular -15 (FHWA HEC-15) classification of vegetative covers or a local authority on appropriate species selection for more information.
5. Where the maximum shear stress is less than the permissible shear stress of the vegetation alone (i.e., <2lbs/ft² or 5 ft/sec) is the only instance where degradable erosion control blankets should be utilized. The listed maximum shear stress for vegetation is from FHWA's "Design of Roadside Channels with Flexible Linings" (HEC-15), Table 2.
6. Choose a material with higher functional longevity and tensile strength characteristics for an increased factor of safety. For more information see "Storm Water Technology Fact Sheet: Turf Reinforcement Mats", EPA 832-F-99-002, September, 1999.

Product Specifications

Erosion Control Blanket Specifications

Property	Test Method	Units	OOS1TT	00S2TT	OCS2TT	OOC2TT	OOS2AN	OCS2AN
Thickness	ASTM D6525	in (mm)	.28 (7)	.28 (7)	.34 (9)	.26 (6)	.28 (7)	.34 (9)
Tensile Strength	ASTM D6818	lb/in (kN/m)	4.8 (.8)	10.0 (1.8)	13.0 (2.3)	18.4 (3.2)	16.0 (2.8)	16.0 (2.8)
Elongation	ASTM D6818	%	15 md 20 td	20 md 26 td	31 md 29 td	25 md 25 td		
Mass per Unit Area	ASTM D6475	oz/yd^2 (g/m^2)	8.0 (271)	8.0 (271)	8.9 (302)	9.5 (322)	8.0 (271)	8.9 (302)
Functional Longevity	ASTM	months	12	12	24	36	12	24

NOTE:

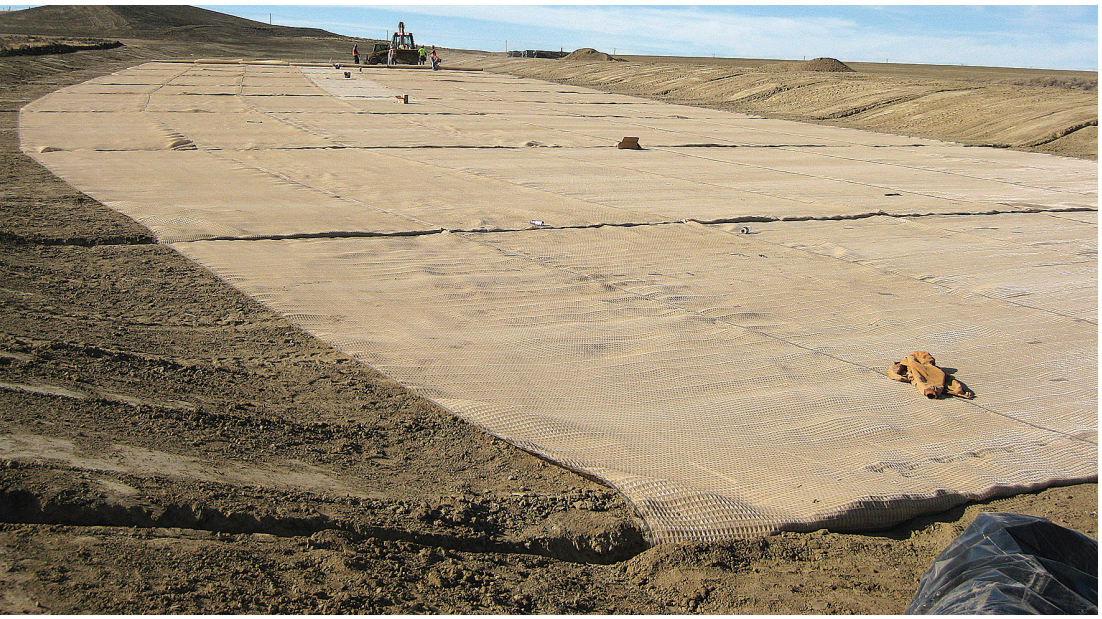
Standard roll size for these styles is 2.4 m x 34.3 m (8’ x 112.5’) with 84 m^2 (100 yd^2) per roll.

Turf Reinforcement Mat Specifications

Property	Test Method	Units	PP58GTR	PP510GTR	PP512GTR	PP5HD	PP5-XTREME
Thickness	ASTM D6525	in (mm)	0.34 (8)	0.36 (9)	0.38 (10)	0.30 (7)	0.30 (7)
Tensile Strength	ASTM D6818	lb/ft (kN/m)	20.8 x 17.7 (3.6 x 3.1)	20.8 x 17.7 (3.6 x 3.1)	20.8 x 17.7 (3.6 x 3.1)	2,500 x 2,250 (36 x 33)	4,000 x 3,000 (59 x 44)
Elongation	ASTM D6818	%	25 x 24	25 x 25	25 x 25	25 x 20	25 x 22
Mass Per Unit Area	ASTM D6566	oz/yd^2 (g/m^2)	8.0 (271)	10.0 (339)	12.0 (407)	9.2 (312)	9.2 (312)
Light Penetration	ASTM D6567	%	35% open	25% open	20% open	25-30% open	25-30% open
Water Absorption	ASTM D1117	%	N/A	N/A	N/A	N/A	N/A
Resiliency	ASTM D6524	%	89%	87%	88%	95%	95%
Porosity	Computed	%	97%	96%	96%	96%	96%
UV Stability	ASTM D4355	%	100% (500 hr) 90% (1,000 hr)	100% (500 hr) 90% (1,000 hr)	100% (500 hr) 90% (1,000 hr)	100% (500 hr) 90% (3,000 hr)	100% (500 hr) 90% (6,000 hr)

NOTES:

1. Values for machine and cross machine, respectively, under dry or saturated conditions. Minimum average roll values are calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported. Typical indicates mean or average of all test data.
2. Resiliency defined as percent of original thickness retained after 3 cycles of a 100 psi load for 60 seconds followed by 60 seconds without load.
3. Porosity calculation based upon mass per unit area, thickness and specific gravity.
4. Ground Cover Factor represents “% shade” from Lumite Light Projection Test.



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