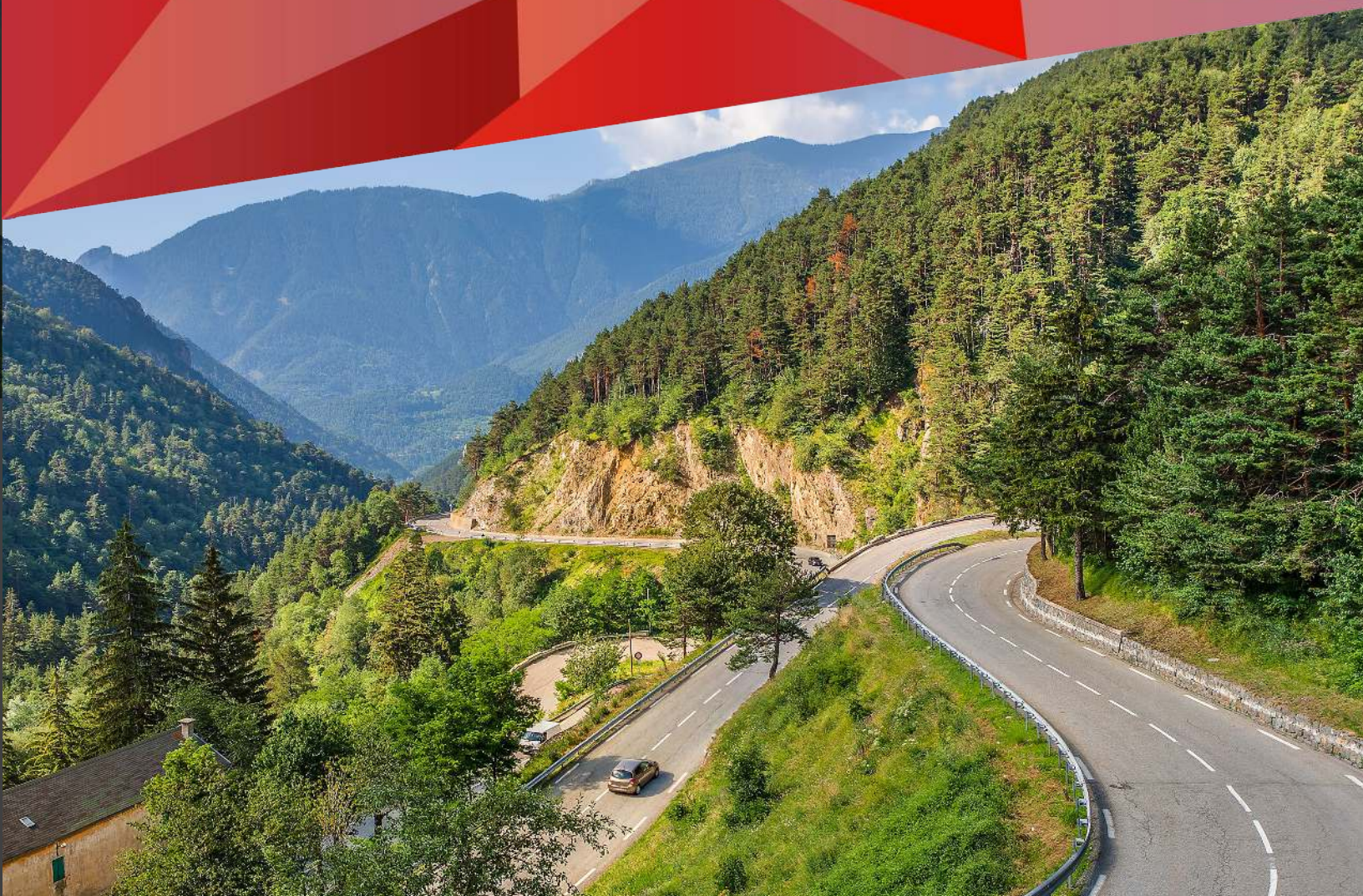
Propex®
GEOSOLUTIONS

ARMORMAX®
ENGINEERED EARTH ARMORING SOLUTIONS



ARMORMAX®

The ARMORMAX® Engineered Earth Armoring Solution is the most advanced flexible armoring technology available for severe erosion and surficial slope stability challenges. ARMORMAX® can be used in erosion control applications where additional factors of safety are required, including protecting earthen levees from storm surge and wave overtoppping, and stream, river and canal banks from scour and erosion. In addition, this system is ideally suited to protect storm water channels in arid and semi-arid environments where vegetation densities of less than 30% coverage are anticipated. For slope stability applications, the system can be further engineered to provide surficial slope stabilization to resist shallow plane failures. Consisting of our PYRAMAT® woven three-dimensional High Performance Turf Reinforcement Mat (HPTRM) with X3® fiber technology and Engineered Earth Anchors, you can count on the ARMORMAX® Engineered Earth Armoring solution to hold its ground.

Durable Armoring System

Lightweight protection layer securely anchored to the subgrade for long-term design life

Withstands Extreme Hydraulic Stresses

The PYRAMAT® HPTRM component of ARMORMAX® has been tested at CSU comparable to traditional armoring methods

Resists Non-Hydraulic Event Damage

High strength survivability woven surface resists non-hydraulic stresses like debris and main- tenance operations

Secures Erosion Control Applications

Anchors act as tie-down mechanisms, securing the HPTRM firmly to the ground for additional safety factors

Stabilizes Slope Stability Applications

Engineered to provide surficial slope stabilization to resist shallow plane failures

OTHER FEATURES & BENEFITS

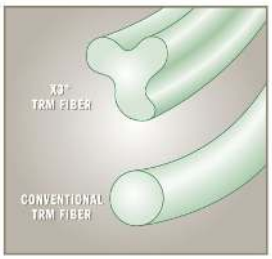
- Supports the EPA Green Infrastructure initiative
- Recognized as a stormwater Best Management Practice (BMP) and is proven to reduce erosion and reinforce vegetation for low-impact, sustainable design
- Easy to handle, lightweight components for rapid installation
- Use of lightweight equipment and unskilled labor facilitates installation with limited site access
- Aesthetically pleasing and more cost effective than conventional methods such as rock riprap and concrete paving

Outperforms and is more cost effective than conventional methods, including:

- ✔ Rock riprap
- ✔ Rock slope protection
- ✔ Gabions
- ✔ Concrete blocks or paving
- ✔ Fabric formed revetments

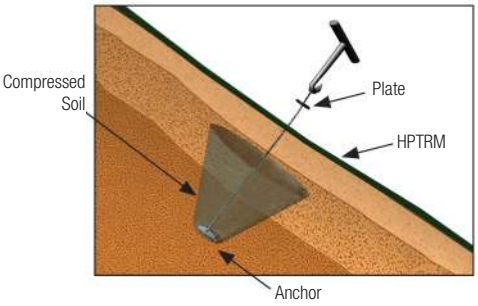
WOVEN THREE-DIMENSIONAL HPTRM PROTECTION LAYER FEATURING X3® FIBER TECHNOLOGY

- ✔ Unique X3® fiber shape provides over 40% more surface area than conventional fibers to capture the moisture, soil and water required for rapid vegetation growth
- ✔ Exhibits extremely high tensile strength as well as superior interlock and reinforcement capacity with both soil and root systems
- ✔ Maximum ultraviolet protection for long-term design life
- ✔ Netless, rugged material construction stands up to the toughest erosion applications where high loading and/or high survivability conditions are required



ENGINEERED EARTH ANCHORS SECURE THE MAT TO THE GROUND

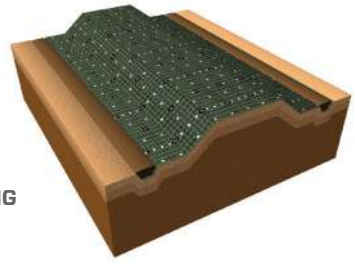
- ✔ Made of corrosion resistant material to provide considerable mechanical strength and durability during installation and in service
- ✔ Connected to a zinc-aluminum coated carbon steel or stainless steel tendon to fully enhance corrosion resistance particularly at the soil air interface
- ✔ As the load exerted on the soil by the ARMORMAX® system increases, a body of soil above the anchor is compressed and provides resistance to any further anchor movement, permanently securing the mat to the ground



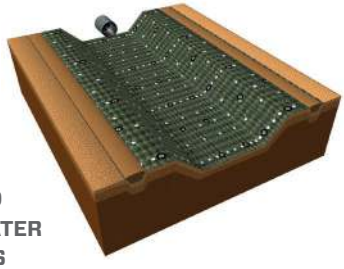
EROSION CONTROL APPLICATIONS

The figures below illustrate the ARMORMAX® system for erosion control applications. The system is comprised of the PYRAMAT® HPTRM and typically Type B1 Engineered Earth Anchors.

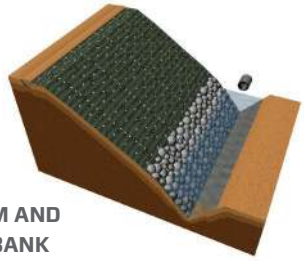
LEVEE ARMORING



ARID/ SEMI-ARID STORMWATER CHANNELS

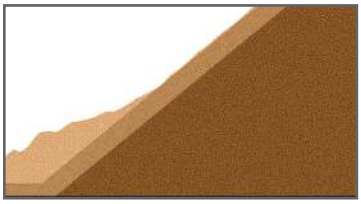


CANAL, STREAM AND RIVER BANK PROTECTION

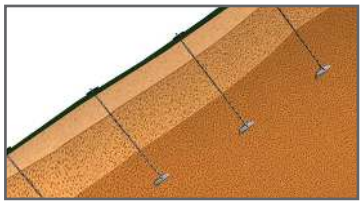


SLOPE STABILITY APPLICATIONS

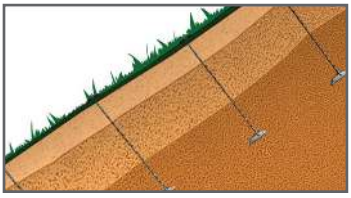
The figures below illustrate the ARMORMAX® system in slope stability applications. The system is comprised of the PYRAMAT® HPTRM and typically Type B2 anchors as specified by the project engineer. Propex may be able to provide preliminary design information.



SHALLOW PLANE FAILURE



APPLY ARMORMAX SYSTEM



VEGETATION GROWTH

PROPEX EROSION CONTROL
PRODUCT GUIDE OF PERMANENT SOLUTIONS

MODERATE

LANDLOK® DEGRADABLE

ECBs

- ✔ Temporary Erosion Control Blankets (EBCs)
- ✔ Low-flow channels and gentle slopes
- ✔ Up to 3 years*

LANDLOK® STITCH-BONDED

STITCH-BONDED TRMs

- ✔ 1st generation Turf Reinforcement Mats (TRMs)
- ✔ Moderate-flow channels, bank protection and steep soil slopes
- ✔ Up to 10 years*

PYRAMAT®

WOVEN HPTRMs & TRMs

- ✔ 2nd Generation Woven Technology
- ✔ High Performance Turf Reinforcement Mats (HPTRMs) and Turf Reinforcement Mats (TRMs)
- ✔ High-flow channels, extreme slopes, pipe inlets and outlets and other arid/semi-arid applications
- ✔ Up to 25, 50 & 75 years*

SEVERE

ARMORMAX®

ENGINEERED EARTH ARMORING SYSTEM

- ✔ System consisting of HPTRM and Engineered Earth Anchors
- ✔ Earthen levees and stream, river and canal banks
- ✔ Stormwater channels in arid and semi/arid environments
- ✔ Surficial slope stabilization
- ✔ Up to 50 & 75 years*

**Design life performance may vary depending depending on field conditions and applications.*

ARMORMAX KEY PHYSICAL PROPERTIES

Material Composition: Proprietary ultraviolet protection package in PYRAMAT HPTRM, and the durability of the anchor provides long-term design assurance.
Tensile Strength: PYRAMAT HPTRM boasts 4000 x 3000 lb/ft (58.4 x 43.8 kN/m) of tensile strength, which exceeds the U.S. EPA definition of a High Performance Turf Reinforcement Mat.
Seedling Emergence: PYRAMAT HPTRM features X3® fiber technology, which offers 40% more fiber surface area to capture the critical sediment and moisture needed to increase seed germination within the first 21 days.
Flexibility: Allows the system to conform and maintain intimate contact with the prepared subgrade.
Anchor Loading Capacity: Based on anchor size, tendon length and on-site soil parameters the anchor foot provides up to an ultimate of 500 to 3000 lbs of pullout resistance per anchor.
Actual holding strengths depend upon soil characteristics, anchor type and installation techniques.

PROPERTY	TEST METHOD	ENGLISH	METRIC
ORIGIN OF MATERIALS			
% U.S. Manufactured		100%	100%
PHYSICAL			
Thickness [2]	ASTM D-6525	0.40 in	10.2 mm
Light Penetration (% Passing) [3]	ASTM D-6567	10%	10%
Color	Visual	Green or Tan	
MECHANICAL			
Tensile Strength [2]	ASTM D-6818	4000 x 3000 lbs/ft	58.4 x 43.8 kN/m
Elongation [2]	ASTM D-6818	40 x 35 %	40 x 35 %
Resiliency [2]	ASTM D-6524	80%	80%
Flexibility [4]	ASTM D-6575	0.534 in-lb	616,154 mg-cm
ENDURANCE			
UV Resistance % Retained at 6,000 hrs [4]	ASTM D-4355	90%	90%
UV Resistance % Retained at 10,000 hrs [4]	ASTM D-4355	85%	85%
PERFORMANCE			
Velocity (Vegetated) [4, 5]	Large Scale	25 ft/sec	7.6 m/sec
Shear Stress (Vegetated) [4, 5]	Large Scale	16 lb/ft²	766 Pa
Manning's n (Unvegetated) [4, 6]	Calculated	0.028	0.028
USACE / CSU Wave Overtopping	Large Scale	USACE Approved	
Seedling Emergence [4]	ASTM D-7322	296%	296%
ROLL SIZES [7]		8.5 ft x 90 ft 15.0 ft x MR	2.6 m x 27.4 m 4.6 m x MR

TYPE B1 ANCHOR PROPERTIES

PHYSICAL		ENDURANCE/ COMPONENT MATERIALS	
Anchor Head Length	3.4 in	Anchor Head	Die cast aluminum
Anchor Head Width	1.0 in	Cable Tendon	Zinc-aluminum carbon steel
Anchor Head Bearing Area	2.5 in²	Load Bearing Plate	Die cast zinc
Anchor Head Weight	0.1 lbs	Load-Lock Mechanism	Die cast zinc w/ceramic roller
		Crimped Ferrule	Aluminum
PERFORMANCE		**MECHANICAL**	
Load Range (Cohesive through Non Cohesive Soils)	Up to 500 lbs	Ultimate Strength	1,100 lbs
Embedment Depth	Up to 5 ft	Working Load	800 lbs

NOTES:

1. The property values listed above are effective 07/13/2015 and are subject to change without notice.
2. Minimum average roll values (MARV) 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.
3. Maximum Average Roll Value (MaxARV), calculated as the typical plus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance testing will meet to the value reported.
4. Typical Value.
5. Maximum permissible velocity and shear stress has been obtained through vegetated testing programs featuring specific soil types, vegetation classes, flow conditions, and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information.
6. Calculated as typical values from large-scale flexible channel lining test programs with a flow depth of 6 to 12 inches.
7. Master Roll (MR) is to be up to 600 feet in length.

ARMORMAX®

WORLD CLASS ENGINEERED EARTH SOLUTIONS & SERVICES

Propex GeoSolutions is one of the largest geosynthetic and erosion control manufacturers in the world, offering full service engineering support for multiple applications, all while creating an Engineered Earth Solution. Our solutions are guaranteed to outperform conventional methods, capitalizing in various markets such as Transportation, Slope Stabilization, Shoreline Restoration, and Flood Control.

Applications include:

- Roadway Stabilization
- Pavement Rehabilitation
- Canal, Stream, and Channel Protection
- Slope Protection and Stabilization
- Drainage and Filtration
- Earthen Levee Protection

We provide industry leadership, setting standards for quality innovation, and pride ourselves in offering the most comprehensive and advanced technical services and support in the market. Our number one goal is to provide 100 percent customer support.

The many features and benefits of our Engineering Services Team includes:

- Product Selection
- Design Support
- Surficial Slope Stability Analysis
- Erosion Control Analysis
- Paved and Unpaved Roadway Design
- Installation Support
- Construction Details
- Inspection and Validation Testing
- Market Advancement
- Industry Organization Participation
- Product and Application Research

Contact our Engineering Services Team Hotline at 423.553.2465 or email GeoEngineering@propexglobal.com to let us help with your next project.

Propex®

ENGINEERED EARTH SOLUTIONS

CONTACT THE PROPEX TEAM TODAY:

1.800.621.1273

PROPEXGLOBAL.COM

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BBB ACCREDITED BUSINESS

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