

# ARMORMAX™

## Anchored Reinforced Vegetation System

ArmorMax™ Anchored Reinforced Vegetation System is the most advanced flexible armoring technology available for severe erosion challenges. The ArmorMax system can be used in **non-structural applications** where additional factors of safety are required, including protecting earthen levees from storm surge and wave overtopping 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 **structural applications**, the system can be engineered to provide surficial slope stabilization to resist shallow plane failures. Consisting of our woven three-dimensional High Performance Turf Reinforcement Mat (HPTRM) with X3® fiber technology and earth percussion anchors, you can count on the ArmorMax system to hold its ground.



### DURABLE FLEXIBLE ARMORING SYSTEM

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

### WITHSTANDS EXTREME HYDRAULIC STRESSES

The HPTRM component of ArmorMax has been tested at CSU comparable to traditional armoring methods

### RESISTS NON-HYDRAULIC EVENT DAMAGE

High strength survivability woven monolithic surface resists non-hydraulic stresses like debris flows and maintenance operations

### SECURES NON-STRUCTURAL APPLICATIONS

In non-structural applications, the earth percussion anchors act as a tie-down mechanism securing the HPTRM firmly to the ground for additional factors of safety

### STABILIZES STRUCTURAL APPLICATIONS

Engineered to provide surficial slope stabilization to resist shallow plane failures

### OTHER FEATURES & BENEFITS

- ▶ Supports the EPA's Green Infrastructure initiative and is a recognized storm water 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:**

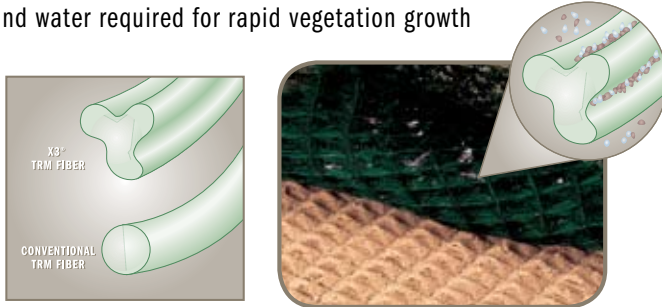
- ▶ Rock riprap
- ▶ Rock slope protection
- ▶ Gabions
- ▶ Concrete blocks or paving
- ▶ Fabric formed revetments

# ARMORMAX™

## Anchored Reinforced Vegetation System

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

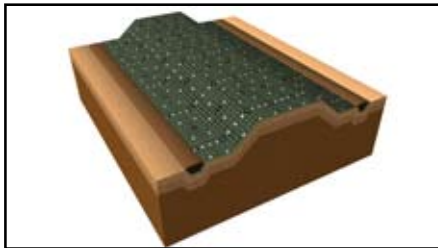
- ▶ Unique X3 fiber shape provides over 40% more surface area than conventional fibers to capture the moisture, soil and water required for rapid vegetation growth



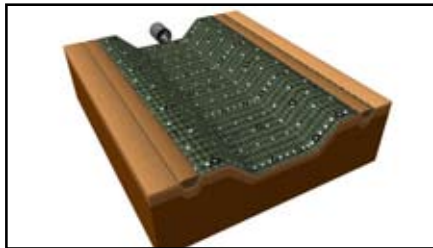
- ▶ Exhibits extremely high tensile strength as well as superior interlock and reinforcement capacity with both soil and root systems
- ▶ Maximum ultraviolet protection for long-term design life
- ▶ Netless, rugged material construction stands up to the toughest erosion applications where high loading and/or high survivability conditions are required

### ARMORMAX NON-STRUCTURAL APPLICATIONS

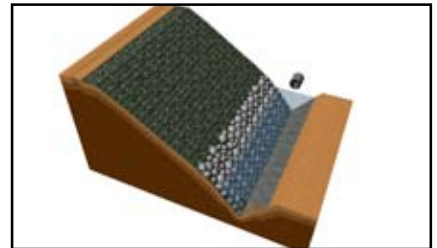
The figures below illustrate the ArmorMax system for non-structural applications. The system is comprised of the HPTRM and typically Type 2 earth percussion anchors.



LEVEE ARMORING



ARID/SEMI-ARID STORM WATER CHANNELS



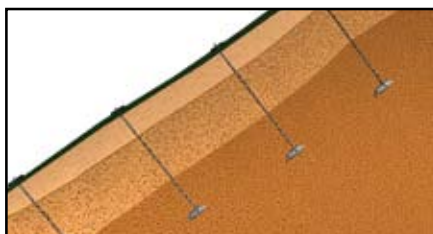
CANAL, STREAM AND RIVER BANK PROTECTION

### ARMORMAX STRUCTURAL APPLICATION

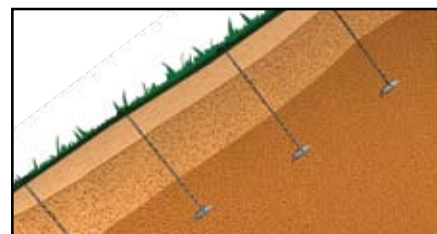
The figures below illustrate the use of ArmorMax in a structural application for surficial slope stabilization. The system is comprised of the HPTRM and Type 1A or 1B earth percussion anchors as specified by the project engineer.



SHALLOW PLANE FAILURE



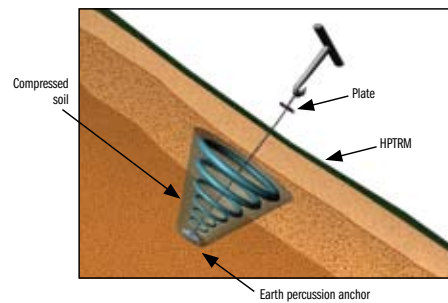
APPLY ARMORMAX SYSTEM



VEGETATION GROWTH

### EARTH PERCUSSION ANCHORS TO SECURE THE MAT TO THE GROUND

- ▶ Made of corrosion resistant aluminum alloy, gravity die cast and heat treated to give considerable increase in mechanical strength and curability both during installation and in service
- ▶ Connected to a threaded rod or stainless 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

## KEY PHYSICAL PROPERTIES OF ARMORMAX™

- ▶ **Material Composition:** Patented ultraviolet protection package in HPTRM, stainless steel tendons and galvanized threaded rods provide long-term design assurance.
- ▶ **Tensile Strength:** HPTRM boasts 4000 x 3000 lb/ft (58.4 x 43.8 kN/m) of tensile strength, which exceeds the U.S. EPA's definition of a High Performance Turf Reinforcement Mat.
- ▶ **Seedling Emergence:** 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.
- ▶ **Holding Strength:** Based on anchor size, tendon rod length and on-site soil parameters the anchor foot provides up to an ultimate of 500 to 5000 lbs of pullout resistance per earth percussion anchor. Actual holding strengths depend upon soil characteristics, anchor type and installation techniques.

## ARMORMAX PROPERTY TABLES<sup>1</sup> ENGLISH & METRIC VALUES





	PROPERTY	TEST METHOD	VALUE <sup>2</sup>	HPTRM
<b>HIGH PERFORMANCE TURF REINFORCEMENT MAT</b>				
PHYSICAL	MASS/UNIT AREA	ASTM D-6566	MARV	13.5 oz/yd <sup>2</sup> 455 g/m <sup>2</sup>
	THICKNESS	ASTM D-6525	MARV	0.4 in 10.2 mm
	LIGHT PENETRATION (% Passing)	ASTM D-6567	TYPICAL	10%
	COLOR	VISUAL	—	GREEN, TAN
MECHANICAL	TENSILE STRENGTH (Grab)	ASTM D-6818	MARV	4000 x 3000 lb/ft 58.4 x 43.8 kN/m
	TENSILE ELONGATION	ASTM D-6818	MARV	25%
	RESILIENCY	ASTM D-6524	MARV	80%
	FLEXIBILITY/STIFFNESS	ASTM D-6575	TYPICAL	0.534 in-lbs 615,000 mg-cm
DURABILITY	UV RESISTANCE @ 6000 HOURS	ASTM D-4355	MINIMUM	90%
	ROLL SIZES	MEASURED	TYPICAL	8.5 ft x 90 ft 2.6 m x 27.4 m
<b>EARTH PERCUSSION ANCHORS</b>				
NON-STRUCTURAL	TYPE 2	2.0 ft 0.6 m		500 lbs 226.8 kg
	TYPE 1A <sup>3</sup>	3.5 ft 1.1 m		2,000 lbs 907.2 kg
STRUCTURAL	TYPE 1B <sup>3</sup>	3.5 ft 1.1 m		5,000 lbs 2268 kg

NOTES: 1. The property values listed are effective 12/2006 and are subject to change without notice.

2. MARV indicates minimum average roll value calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance testing will exceed the value reported.

3. Maximum tendon/wedge grip strength capacity is 2000 lbs. Threaded rods with bolted steel plates up to 5000 lbs.

**PROPEX EROSION CONTROL PRODUCT GUIDE**  
**PERMANENT SOLUTIONS**

MODERATE			SEVERE
			
LANDLOK® STITCH-BONDED TRMS	LANDLOK® WOVEN TRMS	PYRAMAT® WOVEN HPTRMS	ARMORMAX™ SYSTEM
<ul style="list-style-type: none"> <li>▶ 1st generation turf reinforcement mats (TRMs)</li> <li>▶ Moderate-flow channels, bank protection and steep soil slopes</li> <li>▶ Up to 10 years*</li> </ul>	<ul style="list-style-type: none"> <li>▶ 2nd generation turf reinforcement mats (TRMs)</li> <li>▶ Moderate-flow channels, bank protection, and steep soil slopes where greater loading and/or survivability is required</li> <li>▶ Up to 25 years*</li> </ul>	<ul style="list-style-type: none"> <li>▶ High performance turf reinforcement mat (HPTRM)</li> <li>▶ High-flow channels, extreme slopes, pipe inlets &amp; outlets and other arid/semi-arid applications</li> <li>▶ Up to 50 years*</li> </ul>	<ul style="list-style-type: none"> <li>▶ Anchored reinforced vegetation system consisting of HPTRM and earth percussion anchors</li> <li>▶ Earthen levees and stream, river and canal banks</li> <li>▶ Storm water channels in arid and semi/arid environments</li> <li>▶ Surficial slope stabilization</li> <li>▶ Up to 50 years or greater*</li> </ul>

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

For downloadable documents like construction specifications, installation guidelines, case studies and other technical information, please visit our web site at [geotextile.com](http://geotextile.com). These documents are available in easy-to-use Microsoft® Word format.

**PROPEX**® | THE ADVANTAGE CREATORS.™  
 GEOSYNTHETICS

Propex Inc.  
 6025 Lee Highway, Suite 425  
 PO Box 22788  
 Chattanooga, TN 37422

PH: 423 899 0444  
 PH: 800 621 1273  
 FAX: 423 899 7619  
[www.geotextile.com](http://www.geotextile.com)

Geotex®, Landlok®, Pyramat®, X3®, SuperGro®, Petromat® and Petrotac® are registered trademarks of Propex Inc. THIS PUBLICATION SHOULD NOT BE CONSTRUED AS ENGINEERING ADVICE. WHILE INFORMATION CONTAINED IN THIS PUBLICATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE, PROPEX DOES NOT WARRANT ITS ACCURACY OR COMPLETENESS. THE ULTIMATE CUSTOMER AND USER OF THE PRODUCTS SHOULD ASSUME SOLE RESPONSIBILITY FOR THE FINAL DETERMINATION OF THE SUITABILITY OF THE INFORMATION AND THE PRODUCTS FOR THE CONTEMPLATED AND ACTUAL USE. THE ONLY WARRANTY MADE BY PROPEX FOR ITS PRODUCTS IS SET FORTH IN OUR PRODUCT DATA SHEETS FOR THE PRODUCT, OR SUCH OTHER WRITTEN WARRANTY AS MAY BE AGREED BY PROPEX AND INDIVIDUAL CUSTOMERS. PROPEX SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM PROVISION OF SAMPLES, A COURSE OF DEALING OR USAGE OF TRADE.