

An Engineered
**HARD ARMOR SYSTEM FOR
PERMANENT EROSION PROTECTION**




HydroTurf[®]
Advanced Revetment Technology

SUPERIOR ARMORING TECHNOLOGY

Watershed Geosynthetics has developed an innovative revetment system called HydroTurf®. HydroTurf is an economically, environmentally friendly hardened erosion armoring technology, specifically designed to reduce construction and long-term maintenance costs. HydroTurf can perhaps best be described as an impermeable fiber-reinforced concrete liner. It combines engineered synthetic turf with a high friction geomembrane that are locked into place with a specially designed HydroBinder® high-strength infill.

HydroTurf offers the best of both worlds—the environmental and aesthetic benefits of vegetation as well as the performance and maintenance benefits of hard armor. By offering superior erosion control, pointedly less turbidity, and significantly less maintenance, HydroTurf eliminates the headaches of traditional vegetative erosion control systems. HydroTurf is also a more sustainable solution than other hard armor revetment systems since it has a lower carbon footprint.

BENEFITS OVER OTHER REVETMENT SOLUTIONS

Excellent Hydraulic Performance

HydroTurf has been extensively tested in full-scale laboratories and project applications for extreme hydraulic performance. There are no known reports of other revetment technologies having undergone such an extensive testing program without system failure or subgrade erosion.

50+ Year Functional Longevity

Through long-term weathering tests, HydroTurf is designed to have a 50+ year functional longevity when properly maintained.

Less Costly Construction

HydroTurf is significantly less costly than hard armor revetment systems (i.e. concrete, rock riprap, and articulated concrete block). Installed cost for HydroTurf is typically up to 50% less than that for traditional hard armor systems.

Rapid, Low Impact Construction

Construction of the HydroTurf system is rapid, low impact, and scalable. Only small, light-weight construction equipment is needed for installation. On large projects, one (1) construction crew is able to install approximately 1 acre per day. Additional crews can be added to increase this rate.

Significant Long Term Maintenance Cost Savings

Vegetation management and erosion control are significant maintenance costs for Anchored Turf Reinforcement Mat (TRM) products. Maintenance costs for these TRMs may be as high as \$1,500/acre/year. HydroTurf requires minimal maintenance and will drastically lower long-term maintenance budgets.

Reduction in Carbon Footprint

HydroTurf has a lower carbon footprint (1/4 to 1/8) than that of other traditional hardened revetment solutions.

Aesthetics

HydroTurf looks and feels like natural vegetation.

**HydroTurf®
protects against
40 ft/s velocity with
no instability
or damage.**



CHANNEL AND STREAMBANK STABILIZATION

HYDROTURF® APPLICATIONS



Channel and Streambank Stabilization

Hydraulic forces from storm water runoff can cause significant erosion and scour of channels and streambanks. The HydroTurf® revetment technology is designed to resist erosive forces under high velocity conditions, even on steep grade applications.



Shoreline and Bank Protection

HydroTurf's 5,000-PSI proprietary fiber-reinforced infill with the integrated polyethylene (PE) geomembrane provides a hard armor revetment against wave attack and fluctuating water levels. It offers exceptional performance at a lower cost than traditional alternatives.



Dam Overtopping

HydroTurf revetment technology is the solution to provide erosion protection in the high velocity applications of dam spillways and embankments. It has been shown to be able to withstand 5.5 feet of overtopping resulting in a velocity of 40 ft/s with no instability or damage. It is also able to survive and prevent erosion in severe hydraulic jump conditions.



Levees

The HydroTurf engineered revetment solution armors levees for protection against the extreme hydraulic conditions of storm surges, wave overtopping, and river flooding.



Outfall Structures

Outfall structures need to protect watercourses, channels, swales, basins, and other storm water features against erosion. HydroTurf provides an excellent solution for the concentrated and high velocity storm water flows exiting outfall culverts.

Slope Protection

Erosion control on slopes can be challenging, especially when vegetation is difficult to establish. HydroTurf® is the solution for these slopes by providing an armament that looks and feels like natural turf.



Landfill Storm Water Management System

Created specifically for downchutes, bench drains, and perimeter channels on and around landfills, HydroTurf provides superior hydraulic performance capable of handling large flows on steep gradients resulting in very high velocities.



Golf

Used by Top Golf Courses throughout the world, the HydroTurf Revetment System is the ideal solution for courses where natural vegetation takes a beating and is difficult to establish and maintain. These high-traffic and erosion-prone areas include: cart paths, maintenance paths, lake and pond shorelines, drainage channels and outfall protection.



Roof Ballast

HydroTurf is the perfect roof ballast solution for protected membrane roofs. It has been shown to resist uplift at wind speeds over 150 mph. Also, it provides excellent resistance to physical and environmental damage.



Roadside Shoulders and Medians

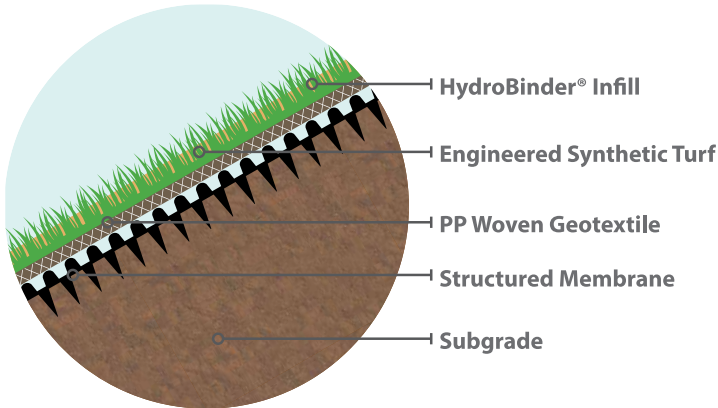
HydroTurf provides a total roadside management system that eliminates erosion, does away with vegetation management, institutes easy long-term maintenance, and has great aesthetics.



TWO SYSTEM CONFIGURATIONS

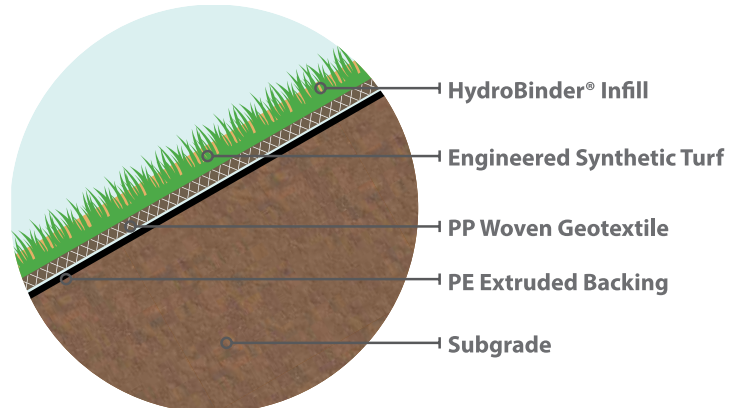
HydroTurf® CS

HydroTurf CS is typically used for high velocity conditions and for protection of critical structures.



HydroTurf® Z

HydroTurf Z is ideal for less critical applications involving lower velocities and flow conditions.



HydroTurf has been extensively tested in laboratories and project applications for extreme performance and real-world durability. From extensive 5.5-ft overtopping flows to simulated 500 year hurricanes, HydroTurf has established a new standard in the most comprehensive array of testing in the industry.

Full-Scale Hydraulic Testing:

- Wave Overtopping for Levee Landward-Side Slope Protection
- Steady State Overtopping
- Hydraulic Jump
- Simulated Heavy Debris Loads
- Intentionally Damaged Conditions

Other Testing & Evaluations:

- Aerodynamic Wind Tunnel
- Flammability
- Freeze-Thaw Durability
- Weathering and Functional Longevity
- Vehicle Loading
- Carbon Footprint



FULL SCALE WAVE OVERTOPPING FLUME TEST

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