

# A Revolutionary Technology for PERMANENT EROSION CONTROL ARMORING



  
**HydroTurf**<sup>®</sup>  
Advanced Revetment Technology

# SUPERIOR ARMORING TECHNOLOGY

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HydroTurf® is an innovative revetment technology that is an economical and sustainable solution for hydraulic applications that require hard armor. HydroTurf was specifically engineered as a high performing revetment with reduced construction and long-term maintenance costs. It 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's low carbon footprint makes it one of the most sustainable hard or soft revetment solutions available.

## ADVANTAGES COMPARED TO OTHER REVETMENT SOLUTIONS

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### Excellent Hydraulic Performance

HydroTurf has undergone extensive, full-scale hydraulic performance testing by independent third party laboratories. Flow velocities of 40 fps and hydraulic jump testing performed with no instability or subgrade erosion. HydroTurf provides predictable hydraulic performance.

### 50+ Year Functional Longevity

A functional longevity of 50+ years is engineered into the HydroTurf system when properly maintained and has been demonstrated through accelerated independent third party laboratory weathering testing.

### 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 other armoring products (i.e., concrete, rock riprap, pipe, articulated concrete block (ACB), and Anchored Turf Reinforcement Mat (TRM) products). Maintenance costs for these products 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 (75-85% reduction) than that of other traditional hardened revetment solutions.

### Aesthetics

HydroTurf looks and feels like natural vegetation.

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



A detailed cross-section of the synthetic turf system. The top layer consists of green, blade-like synthetic grass fibers. Below this is a thick, porous, tan-colored layer of infill. Underneath the infill is a black, textured geomembrane layer. The entire assembly is supported by a dark, perforated backing.

ENGINEERED SYNTHETIC TURF

HYDROBINDER® INFILL (5,000 psi)

GEOMEMBRANE

A wide-angle photograph showing a stream with banks covered in synthetic turf. The water is calm and reflects the surrounding dense forest of trees and foliage. The synthetic turf appears to be a natural-looking green grass, providing a stable and aesthetically pleasing streambank.

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.



### Dam Overtopping

In high velocity applications of dam spillways and embankments, HydroTurf has been shown to protect against overtopping depths of 5.5 feet and the resulting flow velocity of 40 ft/s. It also protects the subgrade from erosion during severe hydraulic jump conditions. HydroTurf is recognized by Dam Safety agencies, including FEMA, as a solution for overtopping protection.



### 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.



### Levees

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



### 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 armoring 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, HydroTurf 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, Medians and Landscaping

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

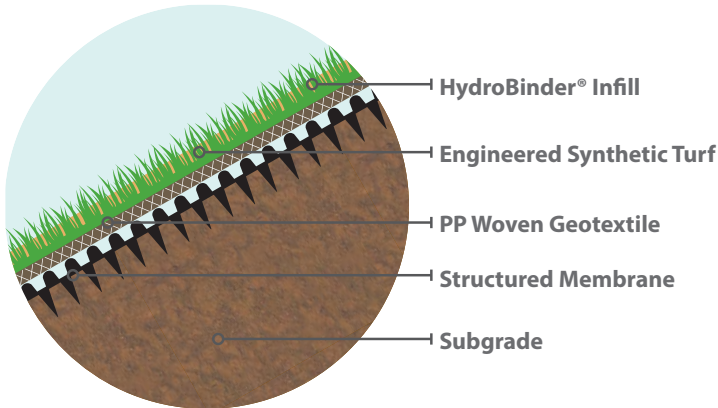




## TECHNOLOGY CONFIGURATION TYPES

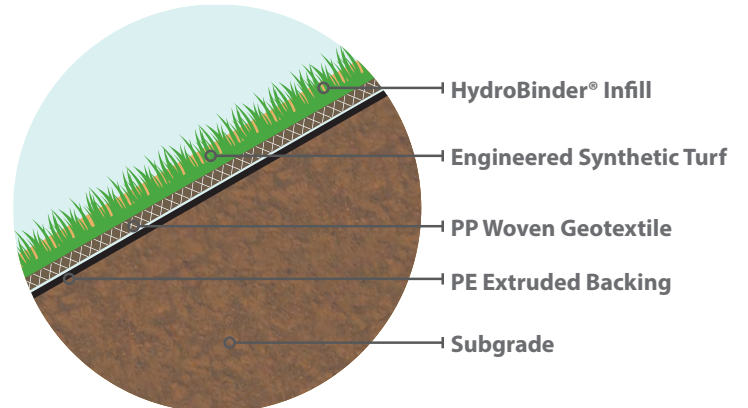
### HydroTurf® CS

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:

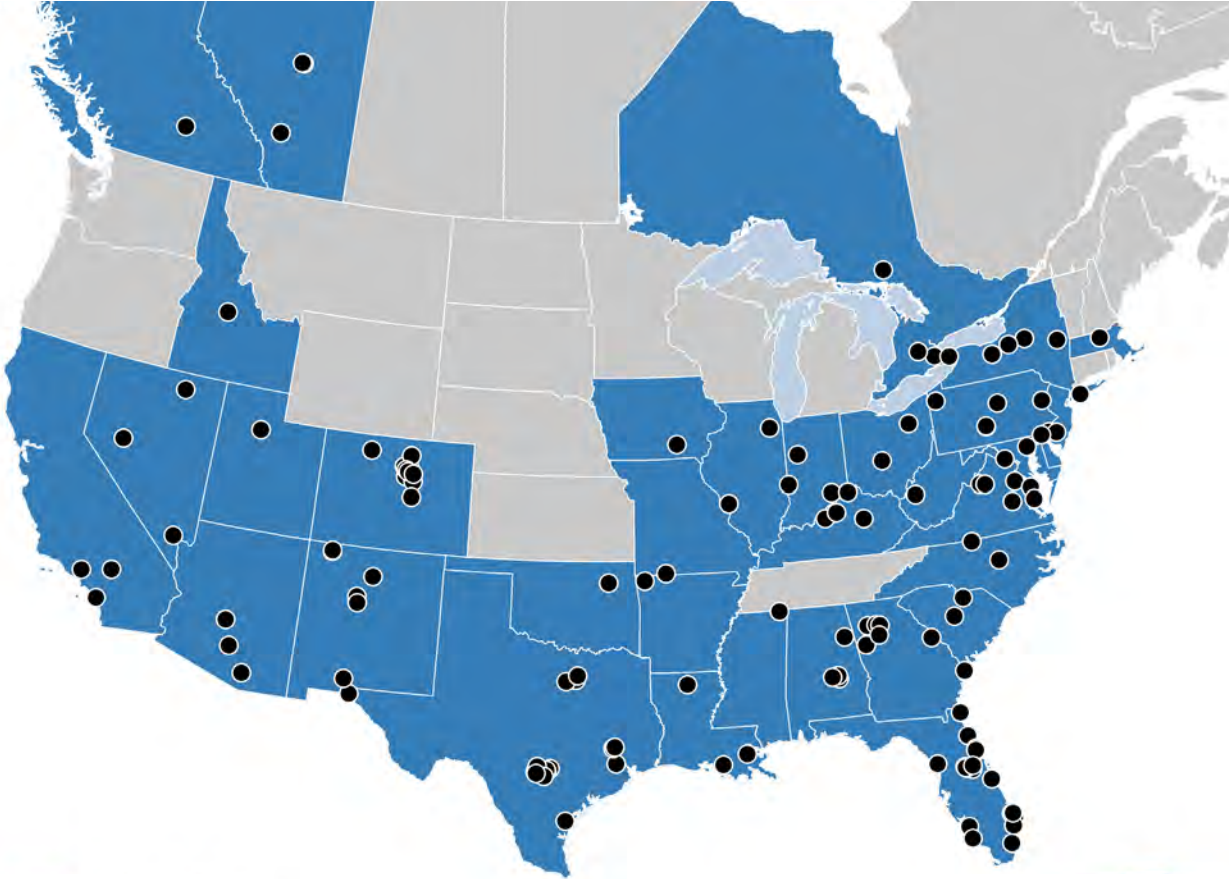
- Aerodynamic Wind Tunnel
- Flammability
- Freeze-Thaw Durability
- Weathering and Functional Longevity
- Vehicle Loading
- Carbon Footprint



FULL SCALE WAVE OVERTOPPING FLUME TEST



## OVER 6,000,000 SF INSTALLED ACROSS NORTH AMERICA



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