

PRESTO



SMART EARTH
SOLUTIONS

Permeable **RECREATIONAL TRAILS**

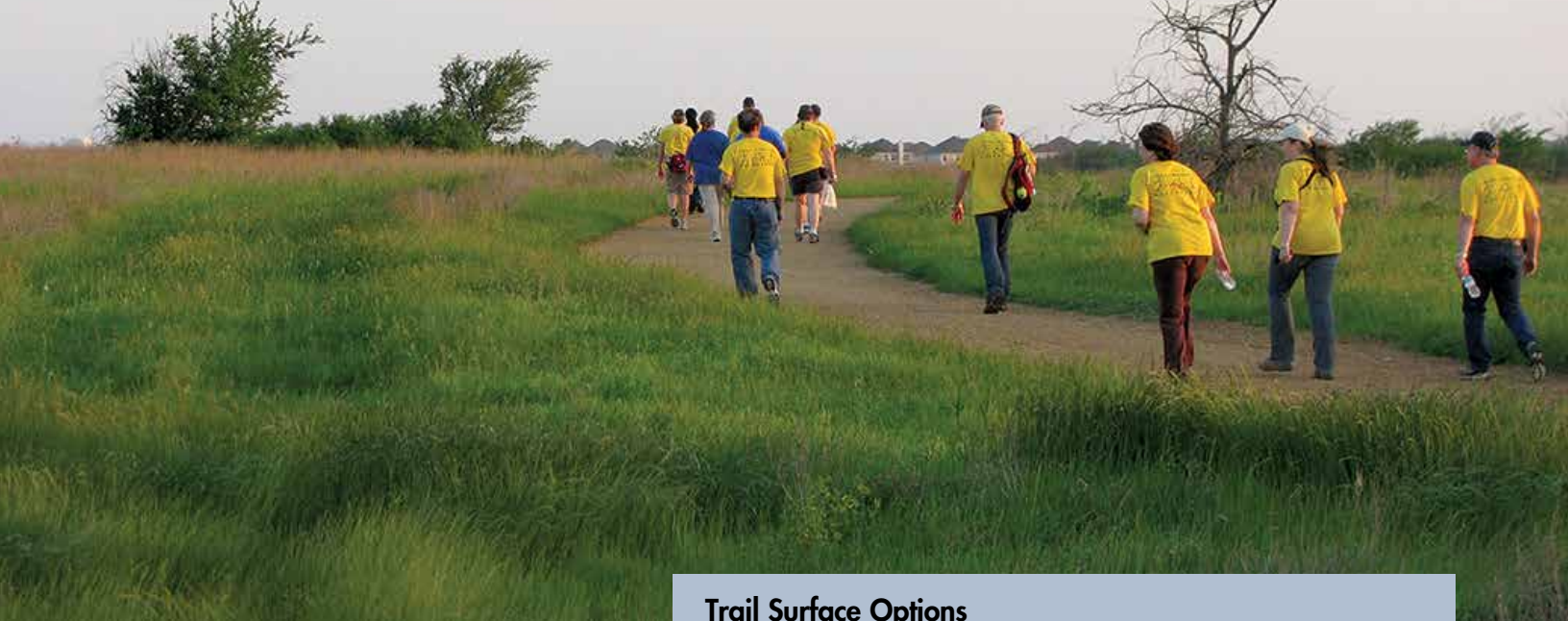
GEOWEB® GEOPAVE® GEOTERRA®



Innovative Solutions for Designing & Building Trails.

Trail Surface Stabilization

The key to planning and building trails into undeveloped or protected areas is using the right reinforcement, drainage and confinement of surface materials. These are critical components to withstand repeated traffic loading, resist degradation from water, minimize impacts to natural resources, and shore up adjacent trail embankments.



TRAIL SURFACE STABILITY

Stability, Permeability and Low Environmental Impact

Protecting the trail surface and adjacent land, and minimizing the impacts to environmentally sensitive areas is key to good trail design. A stable trail surface minimizes rutting, wash boarding and potholes, resists surface erosion, and eliminates standing water that can create muddy, impassable surfaces. The stable trail surface can withstand all types of weather, including seasonal variations like Winter snow and Summer heat.

The overall goal is to maximize surface permeability while maintaining a stable, aesthetically-pleasing, and low-environmental-impact trail that requires minimal maintenance.



Trail Surface Options

Through confinement of aggregate infill, Presto's GEOWEB® and GEOPAVE® trail stabilization systems create a stable, low-maintenance trail surface. The highly permeable systems reduce stormwater runoff and surface water ponding. Both systems perform as on-site, below-ground stormwater retention systems, storing water in the aggregate voids of the pavement layer and base for natural percolation. Non-degradable high-density polyethylene (HDPE) material is unaffected by wet soil or water.



GEOWEB® Flexible 3D Confinement Structure

- Allows use of local, inexpensive fill with low fines.
- Offers design flexibility-several material sizes & depths meet loading & stormwater needs.
- Flexible structure conforms to landscape curves and contours.
- Easy deployment & installation.
- 98% surface open area structure offers lowest environmental impact solution.



GEOPAVE® Rigid Gravel Pavers

- Supports open-graded base course (OGBC) for fast infiltration & natural drainage.
- Herringbone surface offers aesthetic appeal.
- Monolithic mesh bottom keeps aggregate confined and resistant to movement.
- Green construction with product made from recycled HDPE.



Multi-Use Trails

Multi-use trails are designed to accommodate a variety of traffic from walkers, bicyclists, equestrians and vehicles. The GEOWEB® trail system is ideally suited for this environment because of these attributes:

- It is fast to install without heavy equipment—even in difficult or remote terrain.
- Immediately after infill placement, the surface may be driven on by construction vehicles—speeding construction.
- Tendons can be installed to prevent uplift in flood-prone areas.

Several available GEOWEB® cell sizes/depths provide the most economical solution for the intended trail use, subgrade conditions, planned loading/frequency, and stormwater requirements.

Flexibility & Versatility

Surfaces for multi-use trails are built with GEOWEB® sections 8.5 ft. wide x 27 ft. long. The flexible HDPE material is easily cut to accommodate any width or length. Typical infill is crushed stone or permeable infill that will allow stormwater infiltration—especially important in wetlands or trails adjacent to waterways.





Walking Trails

Trails designed for foot traffic may also require ADA compliance or occasional access by maintenance vehicles. GEOPAVE® trails are designed with highly-permeable, open-graded aggregate for fast infiltration. The infill material's small particle size and the rigid nature of the GEOPAVE® units meet the ADA requirement as well as infiltrates and filters runoff pollutants from entering waterways.

- A deeper base may be designed to accommodate loading or stormwater requirements.
- The stable surface virtually eliminates erosion caused by runoff.



Equestrian Trails

Horse traffic is extremely hard on trails. Confinement of trail surface material in the GEOWEB® 3D system can help reduce point load rutting, aggregate loss and surface erosion.

"If I can get to a design and tread condition that will sustain appropriate horse traffic, it will automatically accommodate all other nonmotorized uses".

Trail specialist with the Department of Forestry and Natural Resources





Trails Through Protected Areas & Tree Root Protection

Trails designed through nature preserves or protected areas may require a low-environmental impact solution to prevent environmental damage to grasses, plants and trees. GEOPAVE® and GEOWEB® trails are ideal in these environments. Their load-spreading ability minimizes construction- and traffic-related damage to a tree's critical root zone by reducing soil compaction and damage to near-surface roots that ultimately endanger the tree's structural integrity. Both systems' open-graded aggregate surface is highly permeable, allowing moisture to get to the roots and limiting runoff from the pavement.



Trails Through Wetlands & Coastal Areas

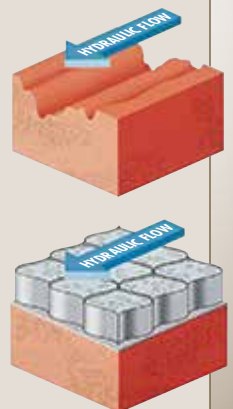


Nature trails built near or through wetlands or through streambeds contend with soft, wet subgrade soils that are often under water in Spring. These trails may also require occasional access by maintenance vehicles, so building the trail with a stable, drainable surface and with materials not impacted by water is paramount. GEOWEB® and GEOPAVE® trails are built in wetlands and environmentally-sensitive areas—their HDPE material is highly resistant to degradation—and does not harm the environment in any way. The HDPE material is also resistant to corrosion, making it an ideal solution in coastal environments.



How GEOWEB® confinement works to minimize trail erosion

Washouts and flooding damage are significantly reduced with GEOWEB® trails. The stable surface is minimally-impacted by flooding and standing water. Water flows over and through the confined infill, limiting movement and controlling sheetflow erosion.



No-Fill, Trail-Hardening Solution

Build 'floating' trails across wetlands and streambeds to bridge wet areas and reduce trail degradation and braiding. Build low-impact trails in areas where infill resources are limited. This is possible without fill using GEOTERRA rigid mats.



Degraded Trail



GEOTERRA®



Rigid No-Fill Mats

GEOTERRA® rigid mats are strong enough to support light-medium traffic from ATVs or light vehicles without infill. Indigenous grasses regenerate through the permeable, open-celled GEOTERRA® mats, ultimately camouflaging the product with the natural environment and protecting the vegetation from damage. The mats can also provide temporary protection during rainy seasons and are easily removed when no longer needed.

GEOTERRA® Attributes & Benefits

- Rigid mats are 'locked' together with PADLOC® connections to form any trail configuration, including grade changes.
- Open surface infiltrates water, allows natural revegetation.
- Temporary or long-term access.
- Fast, easy installation without heavy equipment—ideal for remote areas.

Typical trail braiding caused by wet, unsupported subgrade



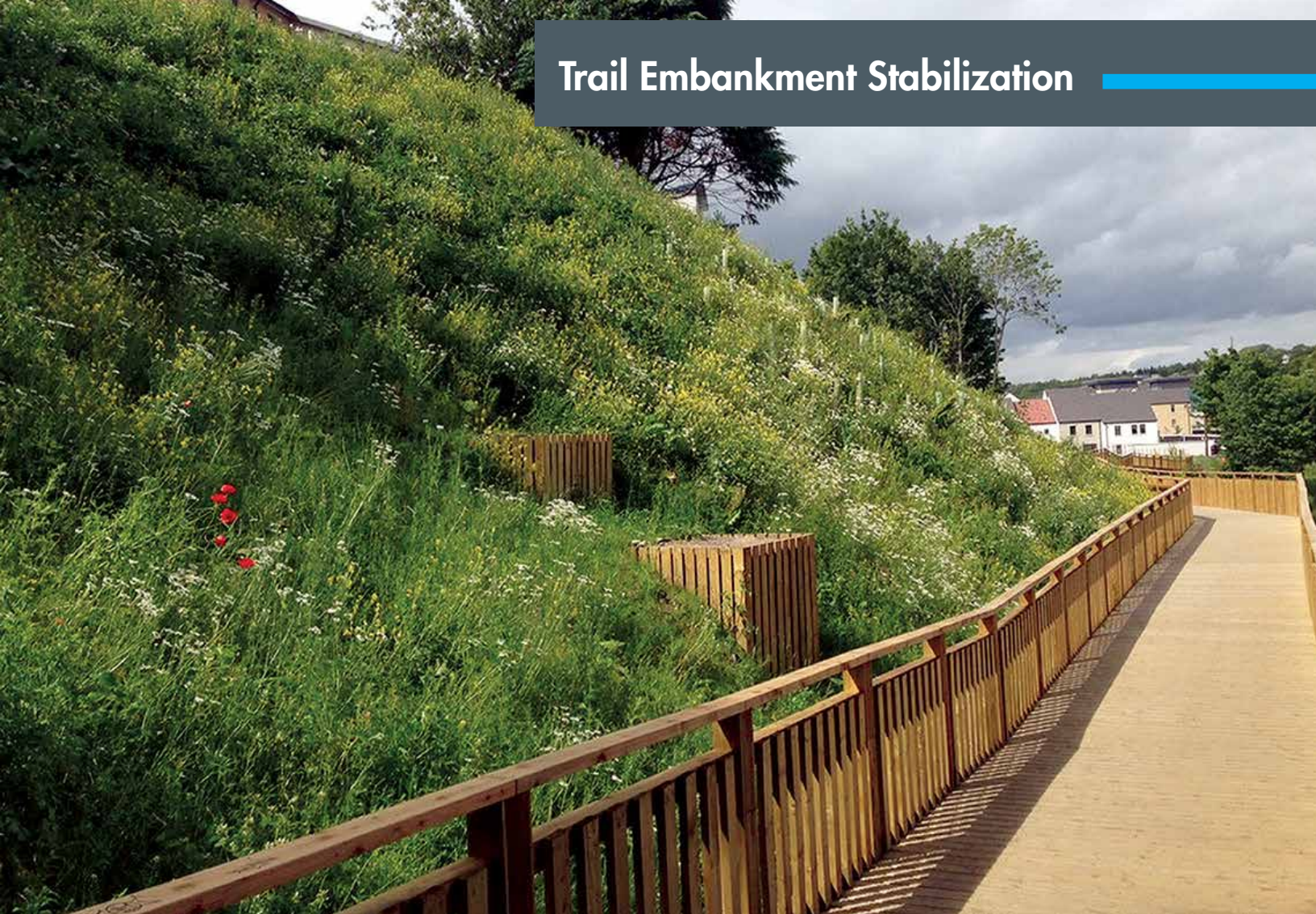
GEOTERRA® mats with aggregate for water crossings



Aggregate infill may be placed in extremely wet areas to help anchor the GEOTERRA® mats and prevent buoyancy lift.



Open Structure Promotes Revegetation



TRAIL EMBANKMENT STABILITY

Slope Protection & Vegetated Retaining Walls

As part of trail design, ensuring embankments along trails become and remain stable can present challenges. The embankments may be part of existing natural terrain, or result from cuts made to accommodate building of new trails.

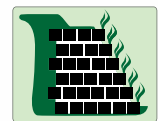
Creating stable, natural environments may also be a key factor in trail design. Depending on embankment steepness, the GEOWEB® 3D system is utilized to stabilize slopes with single layer protection—or build near-vertical, tiered retaining walls with a vegetated fascia. GEOWEB® slopes and walls can accommodate existing structures, or be built with new structures incorporated such as stairs and ramps.

Erosion Protection & Stormwater Control

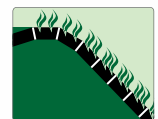
GEOWEB® slope and wall structures minimize the potential for erosion, reduce stormwater runoff, and offer natural blending with the environment. Specific grasses and flowering vegetation provide additional aesthetic appeal.



GEOWEB®
Retaining Walls



GEOWEB®
Slope Protection



Trail Resources

Presto Geosystems® offers free Project Evaluations for **GEOWEB®** Trail Surface Stabilization, Slopes and Retaining Walls.



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