

**PRESTO**



# RECREATIONAL TRAILS

**GOWEB®**

3D Soil Stabilization

**GEOPAVE®**

Gravel Porous Pavement

**GEOTERRA®**

Trail-Hardening

**Application**

**Resource Package**





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**GEOSYSTEMS**

# TRAILS

Innovative Solutions for Design & Build

## Trails Resources

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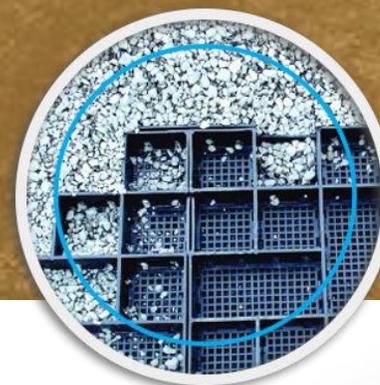


# Create Low Impact Trails

## LONG-TERM STABILITY Environmentally Friendly Solutions

This resource package outlines attributes and applications of the GEOWEB® 3D confinement system, GEOPAVE® porous pavers, and GEOTERRA® trail-hardening mats in recreational trail design for multi-use trails, wetlands & coastal area pathways, and tree root protection.

Resources  
for your project

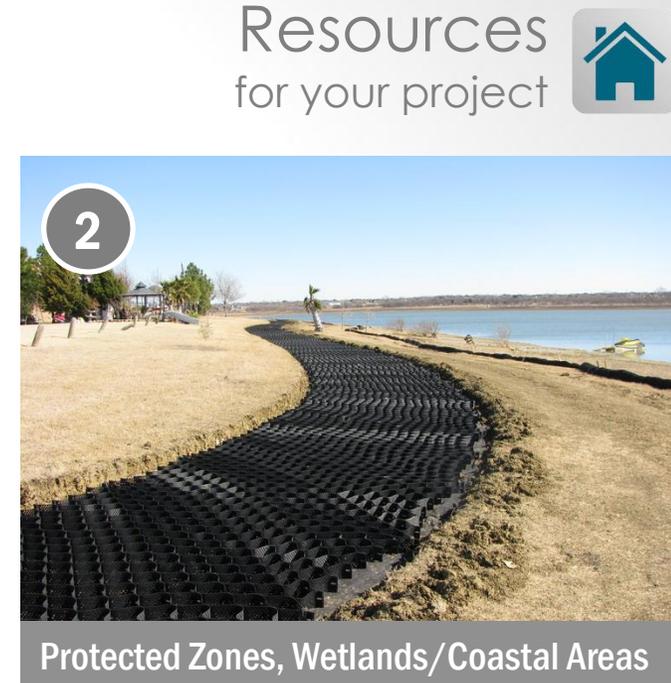
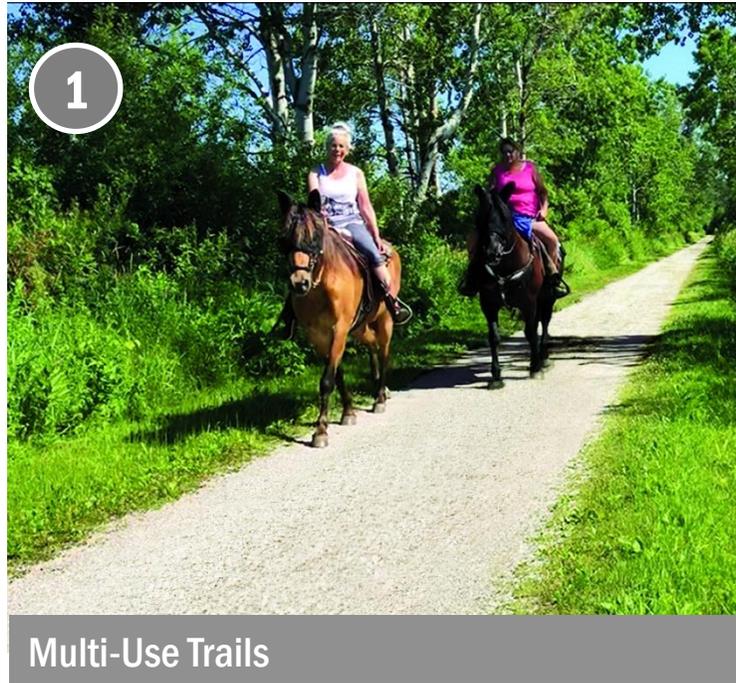


## Key Applications

# Recreational Trails

### Take the Tour.

See how these innovative solutions solve the most challenging site issues in trail applications at a lower cost and with higher performance than alternative solutions.



# Multi-Use Trails

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 and erosion, eliminate rutting, and minimize impacts to natural resources. The overall goal is to maximize surface permeability while maintaining a stable, aesthetically pleasing, and low environmental impact trail that requires minimal maintenance. **Through confinement of aggregate infill, Presto's GEOWEB® and GEOPAVE® Trail Stabilization Systems create a stable, low-maintenance trail surface.**

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## GEOWEB® & GEOPAVE®

Stability. Permeability. Low Environmental Impact.



# BENEFITS

Delivered by the 3D GEOWEB® System

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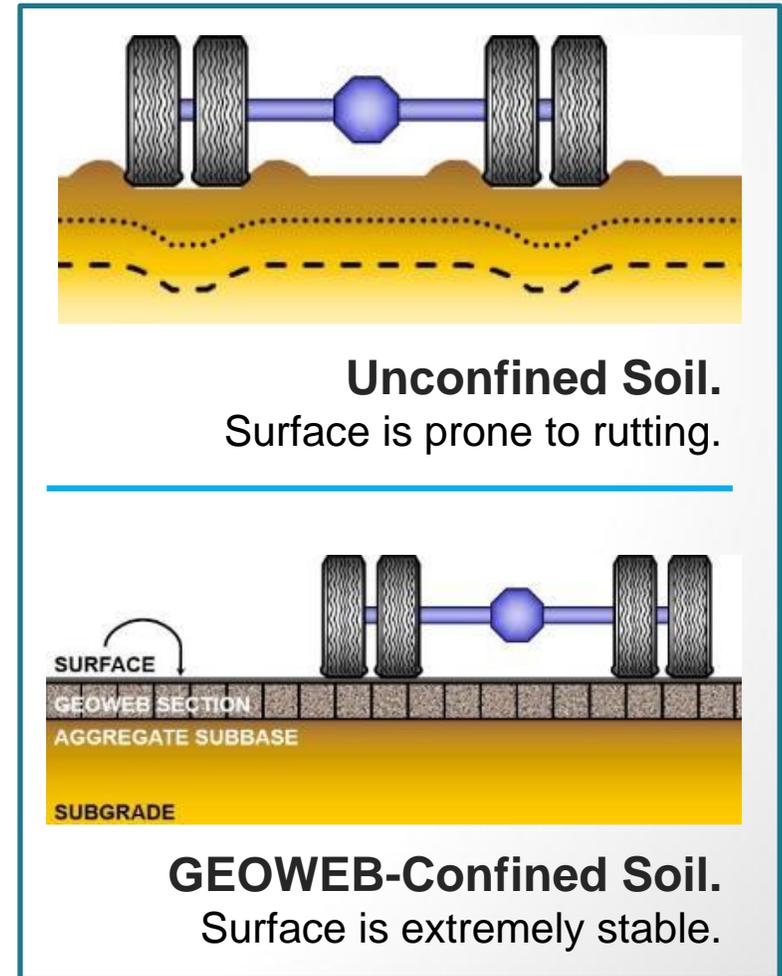
## GEOWEB® Flexible 3D Confinement Structure

### Extends the Life of Trails

The GEOWEB system confines aggregate to prevent erosion and rutting of trails, allowing the use of clean stone infill and creating permeable trail surfaces.

### The GEOWEB 3D Confinement System:

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



# Application Overview

## Multi-Use Trails: GEOWEB®

### Biking, Walking, Equestrian, Vehicles

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 these applications because of the following 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, thereby accelerating 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.



# CASE STUDY

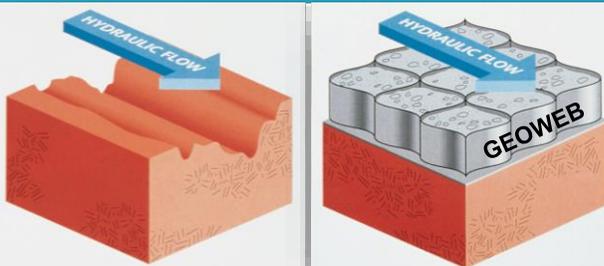
## Shoreline Trail Flood Mitigation

### Trails Through Flood-Prone Area

#### Restored recreational trail washout from flooding

- The client wanted to follow the natural contours of the shoreline, making the flexible GEOWEB system the perfect solution.
- Tendons and anchors were used with the GEOWEB system to prevent potential uplift due to the high water table.
- GEOWEB cells were filled with decomposed granite infill to allow for good drainage.
- After install, over 7 inches of heavy rains occurred in a 3-hour period, flooding portions of the Shoreline Trail.
- The GEOWEB-reinforced trail withstood the storm event and no repair was needed.
- The GEOWEB Soil Stabilization System performed as expected and helped to minimize trail damage.

Water flows over the confined infill, limiting movement and controlling sheet flow erosion.



[See More  
on Case Study >>](#)

Flexible GEOWEB® System conforms to curves & contours.



Trail may be driven on by construction vehicles once filled.

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# BENEFITS

Delivered by the GEOPAVE® Gravel Pavers

Resources  
for your project



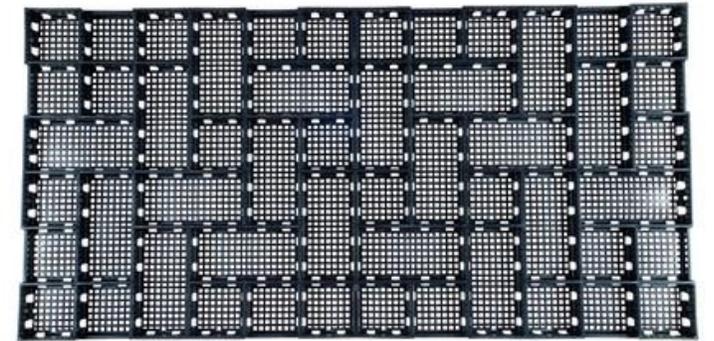
## GEOPAVE® Rigid Gravel Pavers

### Aggregate Pavers for Everyday Traffic

GEOPAVE Gravel Pavers stabilize aggregate surface materials for lower maintenance and protection from surface wear and scour.

#### The GEOPAVE® porous pavement system:

- 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.
- Two color options for the GEOPAVE Units—Black or Tan.
- Two color options for the SNAP Delineators—Yellow or Blue.



**GEOPAVE Units**

(20 in x 40 in. / 2 in Wall Height.)



**SNAP Delineators**

(Yellow & Blue Available)

# Application Overview

## Walking Trails: GEOPAVE®

### Biking, Walking, Vehicles

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 ADA requirements as well as infiltrating and filtering, preventing runoff pollutants from entering waterways.

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



# CASE STUDY

## Permeable Aggregate Pathway

### Walkway Through Nature Reserve

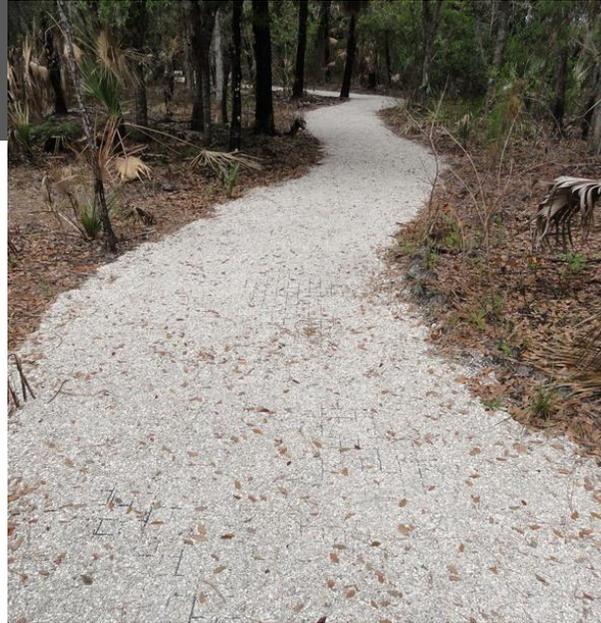
The nature observation trail at Rookery Bay is a barrier-free pathway through one of Florida's most scenic and environmentally sensitive areas.

- Maintaining a stable walkway as well as minimizing the environmental disturbance through the nature reserve in a soft-soil area was challenging.
- The engineer chose the GEOPAVE system for its structural stability, permeability, and ADA wheelchair accessibility.
- Over 15,000 sf of material was installed along the winding pathways, directly over the sand subgrade.
- GEOPAVE units were installed in an offset pattern, changing the orientation of the units with each row.
- Complete system created a flat, stable surface to support pedestrian traffic, along with occasional traffic from maintenance vehicles.

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[See More  
on Case Study >>](#)



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## Protected Areas & Tree Root Protection

The majority of a tree's root system is located within the top three feet of the ground surface. Construction excavation, maintenance vehicle traffic, and compaction can damage or even destroy roots to the point where trees cannot survive.

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 & GEOWEB trails are ideal in these environments.

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# Application Overview

## Trails Through Protected Areas & Tree Root Protection GEOPAVE & GEOWEB

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.

- Open-graded aggregate surface is highly permeable, allowing moisture to get to the roots and limiting runoff from the trail surface.
- High load distribution characteristics spread vehicle and equipment loads on the upper surface, protecting the root zone.
- Quick to deploy & easy to install.



**GEOPAVE Rigid Pavers**



**GEOWEB Geocells**

# CASE STUDY

## Copt Hewick Hall Service Road

### Low-Impact Service Roads

#### Offers Access Over Soft Subgrades & Protection of Tree Roots

##### Project Scope:

When construction equipment and vehicles intrude on a tree's Critical Root Zone, they can negatively affect the soil environment, causing compaction of the soil and damage to near-surface roots—ultimately endangering a tree's structural integrity and survivability.

Presto's GEOWEB 3D Soil Stabilization System proved to be the ideal solution for England's Copt Hewick Hall service road. **The objective: provide permanent access over poor soils and long-term protection of numerous mature trees.**

##### Project Results:

- Only 8 inches of subgrade needed to be excavated compared to the 20 inches required for conventional road construction and subgrades of similar CBR value.
- A needle punched geotextile was installed to provide a suitable separation layer between the subgrade and the specified aggregate fill.
- ATRA® Key connectors (*3X's stronger than stapling, quicker to install, safer*) were used to join GEOWEB panels together end-to-end rather than traditional staples.
- Once secured in position, the GEOWEB panels were infilled with aggregate.
- The road was finished with decorative concrete edging.



[See Copt Hewick Case Study >>](#)



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# Wetlands & Coastal Areas

## GEOWEB & GEOPAVE



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### Economical & Low-Maintenance Options

Nature trails built near or through wetlands or across streambeds contend with soft, wet subgrade soils that are often under water in Spring and rainy months of the year. 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 have been successfully constructed 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.



# CASE STUDY

## Spectacle Pond Shoreline

### Permeable Pavers

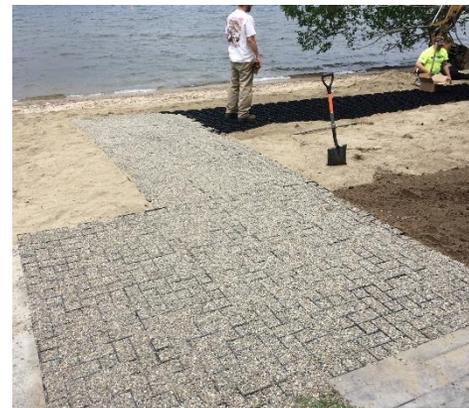
#### Offer Low-Impact Beach Access

Access to Brighton State Park Day Use Area precipitated the need for a pathway along a stretch of Spectacle Pond shoreline—a 102-acre recreational area in Northeast Vermont.

With a requirement to be ADA compliant, as well as porous to allow stormwater infiltration as required by the Vermont DEC, the GEOPAVE® porous pavement system was proposed.

Other products were considered—but GEOPAVE pavers with aggregate infill were chosen as the most stable and sustainable solution for supporting everyday traffic and meeting the stormwater permeability requirements.

The GEOPAVE Porous Pavement System confines open-graded aggregate, allowing a high rate of infiltration to minimize stormwater runoff. The system's molded mesh bottom keeps aggregate from moving under pedestrian—and vehicle traffic.



[See Spectacle Pond  
Case Study >>](#)



# 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.



**GEOTERRA®**  
Rigid No-Fill Mats

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# Application Overview

## GEOTERRA® Attributes & Benefits

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.

- 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.



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# Trail Embankment Stabilization

GEOWEB 3D System

## Slope Protection & Vegetated Walls

As part of trail design, ensuring embankments stability along trails can present challenges. The embankments may be part of existing natural terrain or result from cuts made to accommodate the 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 to 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.



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for your project



# Application Overview

## 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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# Customized Design Support

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## Let Us Evaluate Your Project

### Your site has problems. We can help.

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Our **free project evaluation** considers specific site conditions, loading stresses, and requirements to contain and control water and contaminants.

Email [info@prestogeo.com](mailto:info@prestogeo.com) to request a project evaluation meeting.

[Request Free Project Evaluation >>](#)



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# GEOWEB<sup>®</sup>

3D Soil Stabilization

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from project start to finish.**

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