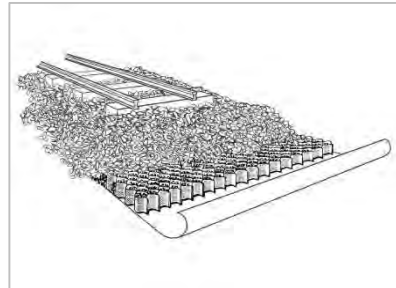




GEOWEB®

3D Soil Stabilization

Design + Construction Resource Package



RAIL INDUSTRY





PRESTO



GEOSYSTEMS

GEOWEB® 3D Soil Stabilization

Rail Resources

What You Will Find

[Key Rail Applications](#)

[How the GEOWEB 3D System Works](#)

[Ballast Reinforcement](#)

[Soft Soil Applications](#)

[High Stress Applications](#)

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[GEOWEB Complete](#)

[Solution Accessories](#)

[Get an Estimate](#)



Support resources for
a successful project.



Better Built Rail Infrastructure

GEOWEB® 3D Soil Confinement

This resource package offers tools & resources to design high-performing, long-lasting rail infrastructure—track, yards, embankments and channels.



Resources
for your project 

See why the GEOWEB® 3D System
is the Rail Industry's Go-To Solution



Key Rail Applications

GEOWEB®
3D Soil Confinement

Take the Tour.

See how 3D soil confinement benefits the most challenging soil and ballast stability issues in rail applications.

Resources
for your project



Ballast Reinforcement



Embankment Stabilization



Yard Stabilization



Stormwater Channels

How 3D Soil Confinement Benefits Rail

Strengthens & Transforms Fill

With the 3D GEOWEB[®] system, fill materials are confined and stabilized—even under the heaviest loading or steepest grades.

The benefits? **Higher performance** and **lower maintenance**—of track, pavements, embankments & channels.

- [View the Overview Brochure](#)
- [Visit our Photo Gallery](#)
- [See Project Case Studies](#)



Ballast Reinforcement Typical Track Problems

Solved by the 3D GEOWEB® System

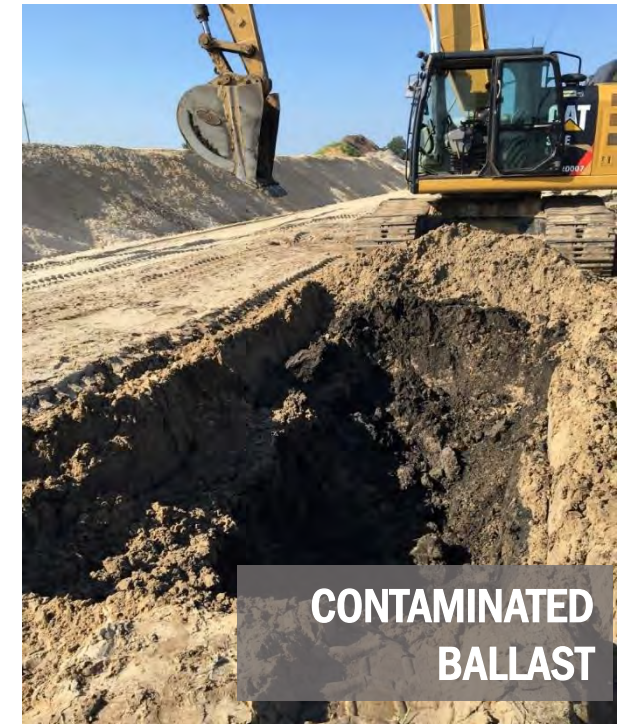


Common Soft Subgrade Issues

- Differential Settlement
- Pumping & Heaving
- Ballast Contamination
- Poor Drainage

Leads to:

- Ballast Attrition
- Maintenance/Shutdown
- Speed Reduction
- Worst Case - Derailment



Ballast Reinforcement BENEFITS

Delivered by the 3D GEOWEB® System

Resources 
for your project

Track

- Reduce ballast attrition
- Bridge poor sub grade soils
- Reduce tamping and maintenance cycles

Special Track Work

- High G force wheel impacts
- Extend life and reduce repair cycles

Bridge Approaches

- Provide high G force transition area
- Reduce settlement

Grade Crossings

- 90 degree loading
- Rigid transition

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Ballast Reinforcement BENEFITS

Use of Lower Quality Fill

Save on Hauling and Material Costs.

When fill is confined in the GEOWEB[®] 3D system—**on-site low quality infill may be used**—even coarse sand or salvaged ballast. Use of lower quality fill is a significant savings on hauling and material costs versus imported ballast.

Save on
Fill Materials

Resources
for your project



Stockpiled
salvaged ballast.



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Ballast Reinforcement **BENEFITS**

Facilitates Better Drainage

No-Fines Infill Improves Drainage

For poor drainage areas, fill with limited fines can be used as the GEOWEB cells provide the confinement and aid compaction of cohesionless soils.

- drainage is significantly improved
- water flows freely through the system preventing pore pressure build up and potential for global failure of the ballast section.

Supports Open-Graded Aggregate



Ballast Reinforcement BENEFITS

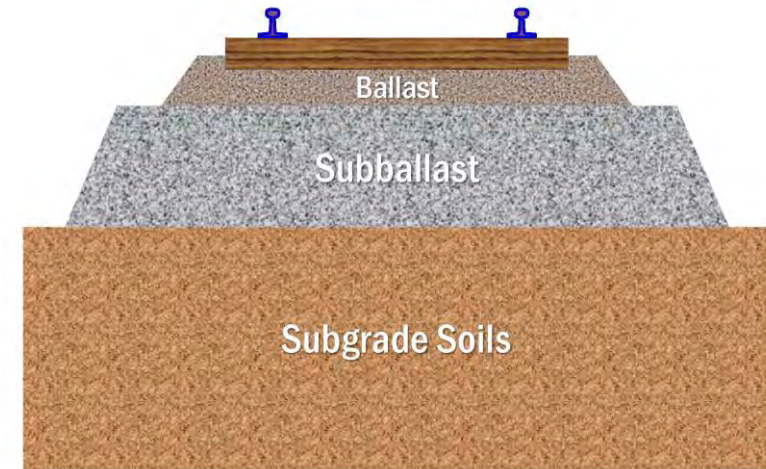
Reduces Cross Section Thickness

GEOWEB[®]-confined sub ballast delivers structural benefits that reduce cross section thickness by up to 60%.

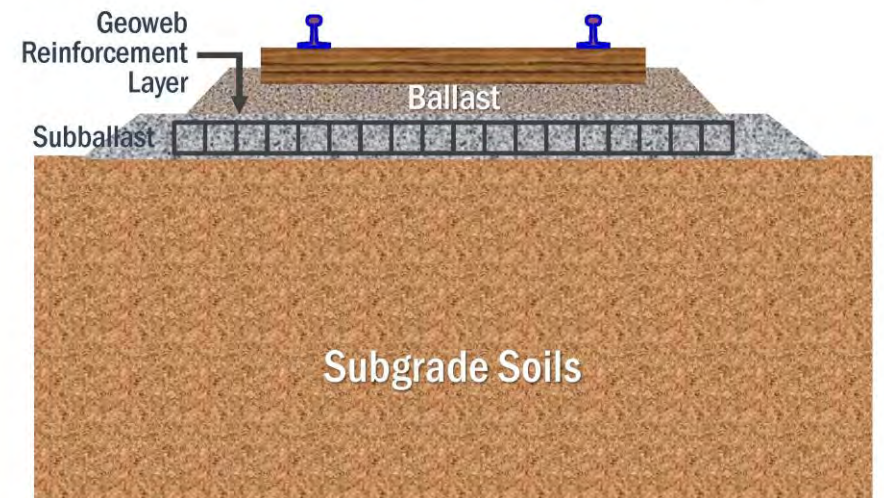
The improvement results in **significantly less installation and rehabilitation costs.**

Up to
60% LESS
Cross-
Section

Typical Track Cross-Section



Track Cross-Section with 3D GEOWEB[®]



SOFT SOIL

Applications



Resources
for your project



Ballast Reinforcement

Many main line tracks cross subgrades with low CBR strength and high groundwater.

Build a strong, stiffened base over soft, wet subgrades with the GEOWEB® 3D system and enhanced woven geotextile.

Free project evaluations are available to help design a solution customized for your site conditions.



Infilling GEOWEB
sections prior to
burrito encasement
to keep stabilized
cross section intact.

SOFT SOIL

Project Case Study



Resources
for your project



Ballast Reinforcement

A combination of geosynthetics were used on an extremely wet peat area for a Border's Railway project to create a stabilized ballast layer. Enhanced woven geotextile and GEOWEB® layers worked together to solve exceptionally soft ground conditions at this site.

See how it worked on the
Borders Railway Project>>



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BORDERS RAIL

Scotland



HIGH STRESS

Applications

At Grade Intersections

Grade crossings are highly prone to stresses from aggressive rail loads and high-volume traffic. Avoid settlement and maintenance issues in these areas and prevent slow-downs.

GEOWEB® 3D confined ballast is a robust solution built to handle these stresses. The system maintains a stable track ballast and **resists the powerful forces in high-stress, concentrated areas.**

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Tower 55
Ft Worth, TX



HIGH STRESS Applications

Bridge Abutments

Bridge abutments are also notoriously high maintenance areas due to high impact loadings and settlement. Chronic maintenance in these **problematic areas can be overcome with a GEOWEB-reinforced ballast layer.**

On a Florida East Coast project, the GEOWEB® 3D system was applied at a bridge abutment and through the grade crossing—both high maintenance areas due to soft soils and frequent, heavy truck loadings.

What FEC Said About the Project

“The area with the GEOWEB stabilization was subjected to over 25 MGT in first year with no deflection. The other end of the bridge without GEOWEB settled over 2 inches and had to be resurfaced twice!”

Chief Engineer Design & Construction, FEC



Minimizes
settlement
& pumping



Learn more about
the project>>



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GEOSYSTEMS®

HIGH STRESS

Applications

Grade Crossings

Replace Asphalt Pavements and Crossings

Traditional asphalt pavements and crossings are vulnerable to failure caused by excessive braking and acceleration forces transferred through the crossing to the subgrade.

Reinforce crossings with the GEOWEB® 3D system to dissipate forces from traffic and rail while delivering a floating platform that absorbs the braking and acceleration forces.



KOSSE, TX
Grade Crossing



HIGH STRESS

Applications



Special Track Work Scales

Scales require a very stable subgrade for accurate measurement. **Strengthen scale areas with the GEOWEB® 3D system for extra stability and accuracy**—especially over soft subgrades.

Presto's engineers work closely with scale manufacturers to develop **project-specific cross sections for each installation.**



Open graded backfill material allows water flow; prevents pore pressure build up

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Ballast Reinforcement

See why the 3D GEOWEB system outperforms 2D geogrids

COMPARE

GEOWEB 3D Stabilization to 2D Geogrids>>



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Accredited. Verifiable. RESEARCH RESULTS

TTCI Test Findings of GEOWEB® Confined Ballast

- Performed at FAST High Tonnage Loop (HTL)
- 2.5 Year test compared to a control section.
- Used imported Mississippi mud with high plasticity clay + CBR of <3% + 30% moisture content.
- GEOWEB system significantly reduced pressure and dissipated load over subgrade with no issues.
- Acceptable track geometry maintained over 2.5 year test and over 185 million gross ton (MGT) loadings applied with less than 0.5 inches of settlement.

**Withstands
Worst-Case
Conditions**

Even with 100,000 gallons of water dumped over the area to induce failure, no appreciable effect was measured.



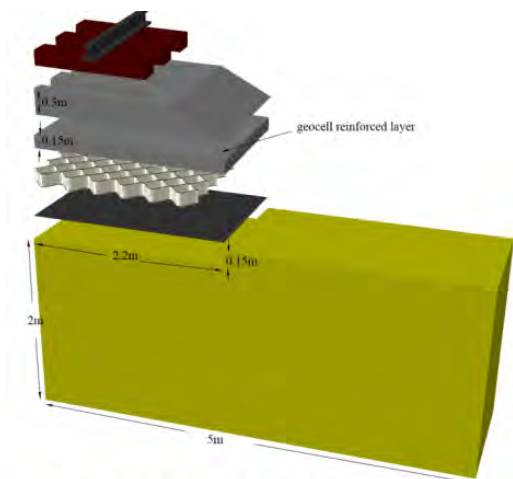
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Accredited. Verifiable. RESEARCH RESULTS

Research Findings of GEOWEB® Confined Ballast

- Significant decrease in settlement < 50%
- Reduces ballast pressure & movement, abrasion and ballast attrition.
- Decrease sub grade pressure < 50%
- Confirmed stress is concentrated at bottom 1/3 of cell – importance of SEAM STRENGTH!
- Confinement allowed track to return to original position after each load cycle



Exploded view of half of GEOWEB-reinforced cross-section.



Reinforced Rail Ballast Finite
Element Analysis (download)

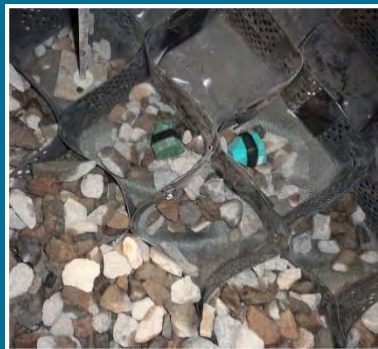


Reinforced Rail Ballast +
Smart Rock Testing (download)

PRESTO



Accredited. Verifiable. RESEARCH RESULTS



Research Findings of SMARTROCK Testing

SMARTROCKs in the ballast layer to measure effectiveness of GEOWEB® 3D confinement to control ballast movement:

- SmartRocks added below the tie and inside GEOWEB® cells to measure particle translation acceleration and velocity in the x, y, and z directions.



Impressive Results:

- Reduces ballast pressure & movement - laterally & vertically
- Significantly decreases abrasion and ballast attrition
- Less ballast attrition < tamping
- Reduced Maintenance - Saves \$!



**Reinforced Rail Ballast +
Smart Rock Testing (download)**



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See GEOWEB® 3D Product in Action

[Visit our Video Gallery](#)

[See Ballast Reinforcement Case Studies](#)

[See Project Photos](#)

Watch the Ballast
WEBCAST >>



Resources
for your project



Embankment Stabilization BENEFITS

Slope Protection

Erosion Control + Slide Repair

Embankments adjacent to track are vulnerable to erosion, slides and washouts under these conditions:

- Steep vertical slope angles
- Unsupported surface layer soils
- Heavily saturated soils
- Drainage & Runoff issues

Protect your rail slopes with the GEOWEB 3D system to **eliminate potential for slides, costly maintenance and downtime.**

[LEARN MORE](#) 

Resources
for your project 



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Embankment Stabilization

BENEFITS

Slope Protection

Vegetated or Hard-Armored Protection

Build or repair your embankment slopes with 3D protection not offered by 2D planar 'cover only' systems with the GEOWEB® slope system. Designed for vegetation—or hard-armored protection with aggregate or concrete fill.

See how the System Works
for **Emergency Repair**>>



Resources
for your project



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Embankment Stabilization BENEFITS

Retaining Walls Flexible MSE Structures

Instability of fill embankments with steep slopes and wet weather exposure can cause saturation, settlement and loss of strength at the base of the fill. The result is a high-maintenance slope requiring frequent repair.

GEOWEB® retaining walls keep fill materials stable and **resistant to the negative impacts caused by saturated soils**. Vegetated or hard-armored fascia.

Resources
for your project



See how it Worked
on a **CSX Project**>>



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GEOSYSTEMS[®]

Yard Stabilization

BENEFITS

Intermodal / Ports

Solve Surface Stability Issues

Build GEOWEB[®] permeable pavements for unpaved intermodal, port and bulk transfer yards with low quality aggregate, recycled materials or coarse sand to **resist ruts, potholes and degradation from heavy vehicle loads**—degradation that can cause pavement failure and high maintenance costs.

See Easy Infilling the
GEOWEB System>>



Resources
for your project



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GEOSYSTEMS

Subgrade Stabilization

BENEFITS

Pavement Base Reinforcement

Solve Base Stability Issues

Support asphalt & concrete pavements with a GEOWEB® reinforced base to resist differential settlement that degrades hard pavements.

Reduce base depth up to 60% with GEOWEB supported base.

See More on GEOWEB Pavements>>



Resources
for your project



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GEOSYSTEMS



Channel Stabilization BENEFITS

Channel Protection Stormwater Drainage

GEOWEB® channels significantly reduce costs of materials and installation. The flexible 3D structure acts as the formwork for concrete fill so no additional forms or reinforcement are required. Each cell acts as an expansion joint which controls cracking.

Fast, efficient installation.

See More on
GEOWEB Channels>>>



Resources
for your project 

UP Laredo channel project saved the client significant costs and time compared to reinforced concrete.



FAST Emergency Response

Resources
for your project 

Emergency Flood Repair

Heavy rain and flooding costs millions each year in maintenance, repair and downtime

Deploy and install GEOWEB® sections for fast action, **emergency repair in hours compared to days required with traditional solutions.**

Make this Your Emergency
Repair Plan>>



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How is it Designed?

Resources
for your project



Let Us Evaluate Your Project

Your site has problems.

Soft ground. Poor subgrade. Poor drainage.
Heavy loading. Limited road building resources.

Will our solution work?

Arrange a meeting with our engineers to evaluate the feasibility of our solutions to meet your site's unique challenges.

Email info@prestogeo.com to request a project evaluation.

Request Free Project
Evaluation>>



Poor subgrade.
Soft ground.
Poor drainage.

Heavy loading.
Limited road
building resources.

PRESTO



How is it Installed?

Resources
for your project



Installation Training

Our experienced technical staff supports rail owners with pre-construction training and construction oversight.

Waste no time on site.

Let our experienced staff train your crews—keeping your operations moving and your costs down.

Email info@prestogeo.com to request construction training & site support.

Request Technical
Meeting & Presentation>>



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Is Installation Weather Dependent?

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for your project



All Weather Material

GEOWEB® projects are installed in extreme temperatures and weather--from the coldest to the hottest regions of the world.

Rain or snow—keep your crews working through any weather condition.



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Resources
for your project



What can the GEOWEB® 3D System
do for your Next Rail Project?



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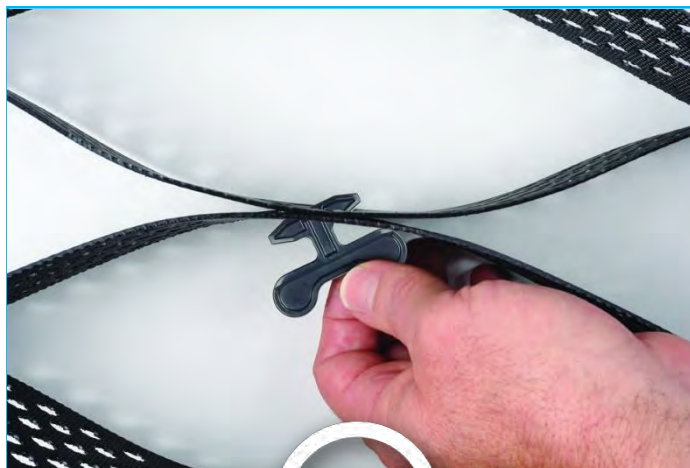
GEOSYSTEMS®



Resources
for your project



Difference Makers. Fast Install Accessories & Tools.



ATRA® Keys

Fast Section Connection

[Download Spec](#)



ATRA® Anchors

Corrosion-Resistant Anchors

[Download Spec](#)



ATRA® Drivers

Fast Anchor Driving Tool

[Download Spec](#)

PRESTO



Fastest Way to Connect GEOWEB® Sections



ATRA® Keys

Fast & Efficient Connection

Faster than Stapling & Non-Corrosive

Side to side and end to end
connections

LEARN MORE



ATRA® Keys

Resources
for your project



3X Faster
than Stapling
Operations



PRESTO



ATRA® Anchors & Drivers

Corrosion-Resistant Anchors

Speed Stakes & Glass-Fiber Reinforced

Strongest hold-down; most secure
cell wall connection.

LEARN MORE



ATRA® Anchors & Drivers



**10X
Faster
Driving
Tool**

than sledge
hammering



PRESTO



Let Our Knowledge Work for You

Resources
for your project



40+ Years Experience

Put our Experience to Work on Your Project

The GEOWEB® system is the original—and most advanced geocell on the market. We developed and continue advancing the technology through research and product development.

Let our knowledge & experience help you solve your rail site problems.

LEARN MORE



PRESTO



Your Project is Important. See How We Can Help.

Resources
for your project



THE PRESTO ADVANTAGE

See how our advanced, adaptable geocells, porous pavers and mats put your project on track for success, and keeps your projects on time and on budget.

WATCH THE VIDEO



What is the Price?

Get an Estimate

Contact our rail engineers who will work with you to provide a price estimate.

Complete our Online Form

[Get a Quote](#)

Resources
for your project





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GEOSYSTEMS®

GOWEB®

3D Soil Stabilization

**Build with
Certainty.**

Get answers to your questions and help
before, during and after construction.

Rely on our experience, tools &
resources to help you get in and out of
sites faster—and to build safely!



**Certainty and Peace of Mind—
from project start to finish.**

Contact Us 1-800-548-3424 | www.prestogeo.com