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STRENGTH. FROM THE GROUND UP.

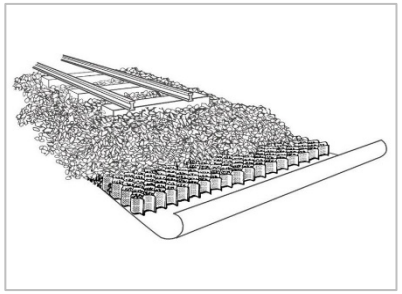
Since 1979

GEOWEB®

3D Soil Stabilization

Design + Construction

Resource Package



RAIL INDUSTRY

PRESTO | GEOSYSTEMS®

GEOWEB® Soil Stabilization

Rail Resources

What You Will Find

- Key Rail Applications
- How the GEOWEB System Works
- Ballast Reinforcement
- Soft Soil Applications
- High Stress Applications
- Compare 3D GEOWEB System to 2D Geogrids
- Research Results
- See Product in Action
- Embankment Stabilization
- Yard Stabilization
- Pavement Base Stabilization
- Channel Stabilization
- Free Project Evaluation
- GEOWEB Complete Solution Accessories
- Get an Estimate

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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.

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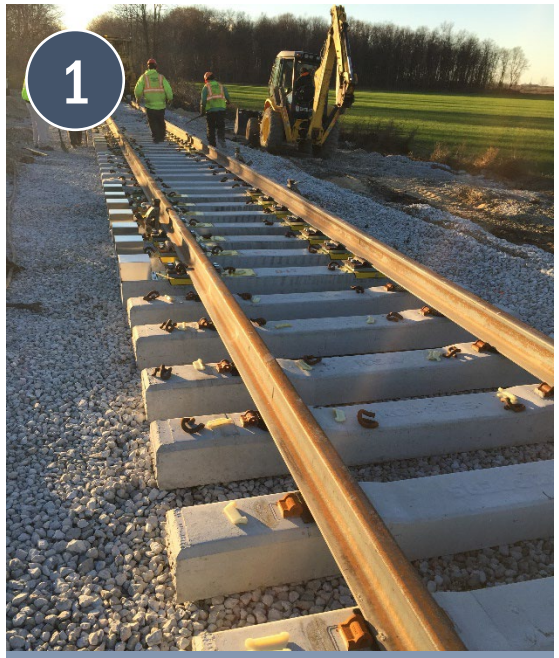
Key Rail Applications

GEOWEB®

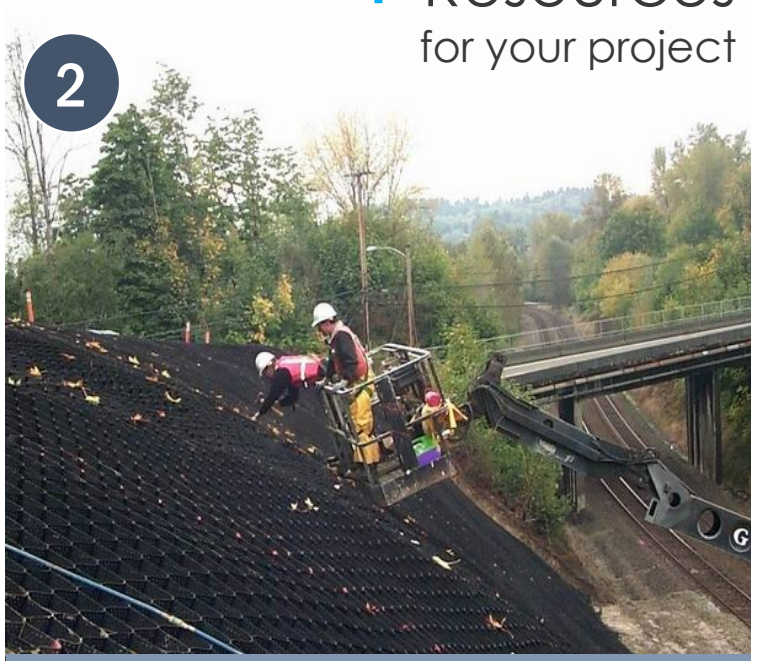
Soil Confinement System

Take the Tour.

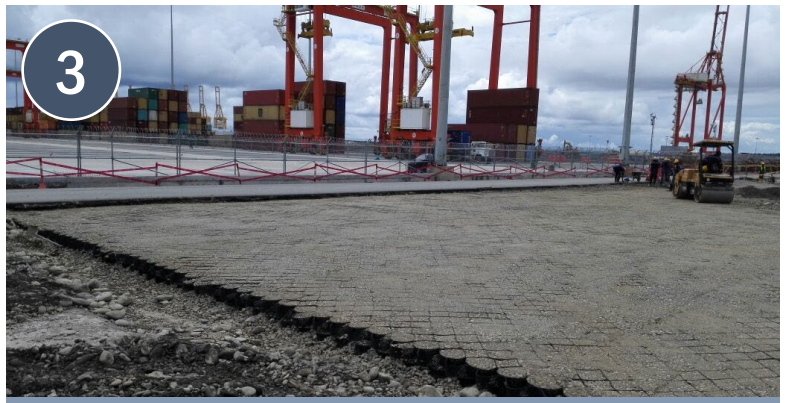
See how geocell soil confinement benefits the most challenging soil and ballast stability issues in rail applications.



Ballast Reinforcement



Embankment Stabilization



Yard Stabilization

Stormwater Channels

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Resources for your project

How 3D Soil Confinement Benefits Rail

Strengthens & Transforms Fill

With the 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 Website
- Visit our Photo Gallery
- See Project Case Studies

Ballast Reinforcement

Typical Track Problems

Solved by the 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

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Ballast Reinforcement
BENEFITS
Delivered by the 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® 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.

Resources
for your project

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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

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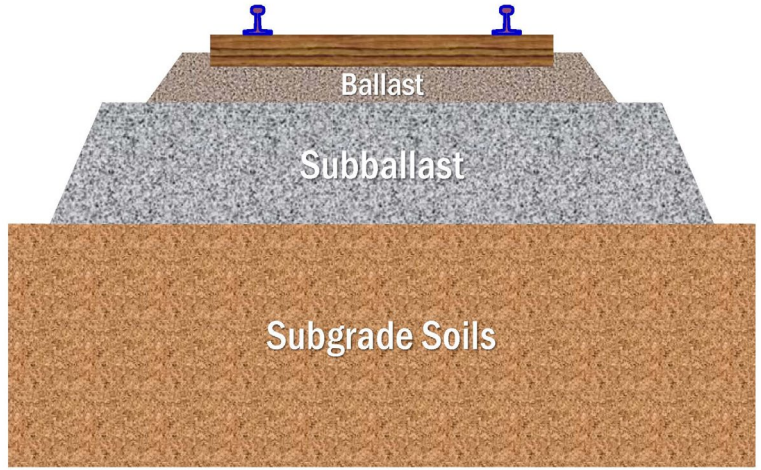
Ballast Reinforcement BENEFITS

Typical Track Cross-Section



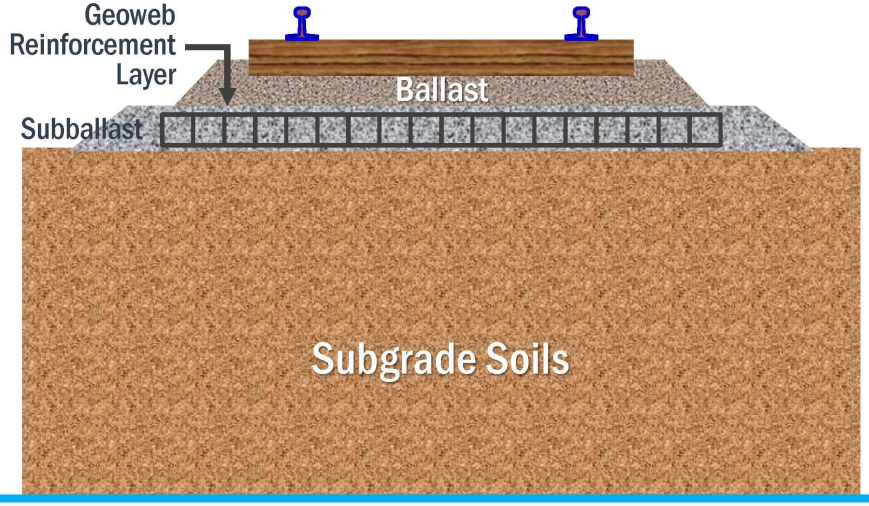
Reduces Cross-Section Thickness

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

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® 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.

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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>>

BORDERS RAIL
Scotland

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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.

Learn more about the project >>

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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

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® system to dissipate forces from traffic and rail while delivering a floating platform that absorbs the braking and acceleration forces.

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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® 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.

TTCI®

See the TTCI Test Results>>

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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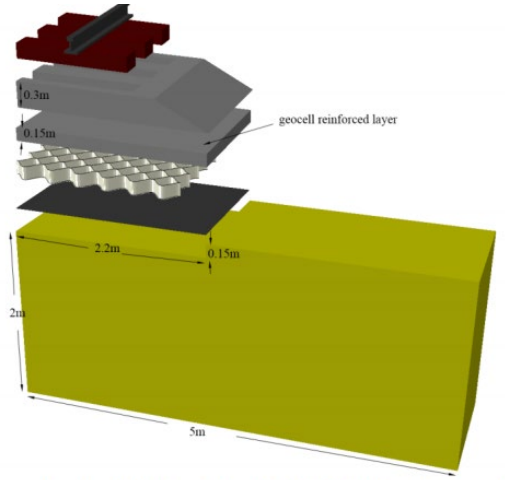
Accredited. Verifiable. RESEARCH RESULTS

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.

OSU Oregon State University

Reinforced Rail Ballast Finite Element Analysis (download)

KU THE UNIVERSITY OF KANSAS

Reinforced Rail Ballast + Smart Rock Testing (download)

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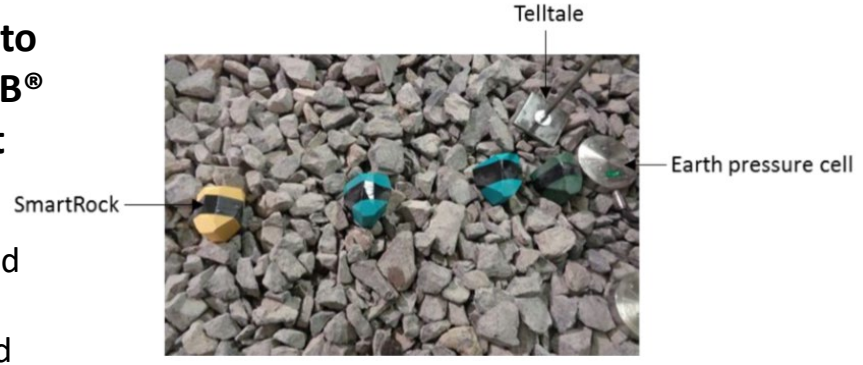
Accredited. Verifiable. RESEARCH RESULTS

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 $!

PennState

Reinforced Rail Ballast + Smart Rock Testing (download)

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Resources for your project

See GEOWEB® 3D Product in Action

[Visit our Video Gallery]

[See Ballast Reinforcement Case Studies]

[See Project Photos]

Watch the Ballast WEBCAST >>

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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

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Resources for your project

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>>**

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Resources for your project

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.

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

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Resources for your project

Yard Stabilization BENEFITS

Intermodel & Ports

Solve Surface Stabilization 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>>

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Resources for your project

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>>

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Resources for your project

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>>

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

FAST Emergency Response

Resources for your project

Emergency Flood Repair

Make this Your Emergency Repair Plan>>

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.**

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Resources for your project

How is it Designed?

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>>

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How is it Installed?

Installation Training

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

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?

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

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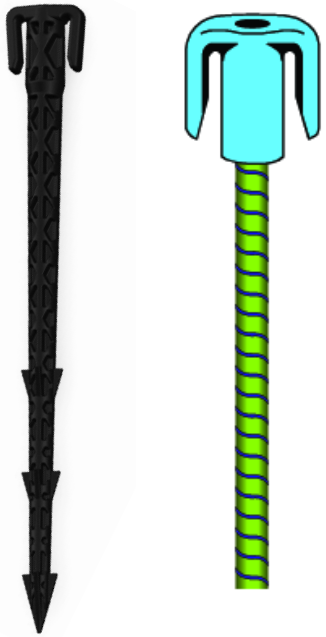
Difference Makers. Fast Install Accessories & Tools.

ATRA® Keys

Fast Section Connection

Download Spec



ATRA® Anchors

Corrosion-Resistant Anchors

Download Spec

ATRA® Drivers

Fast Anchor Driving Tool

Download Spec

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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

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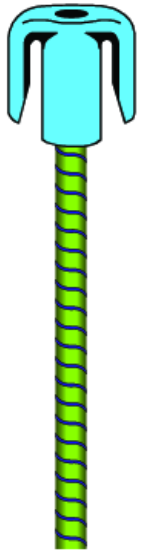

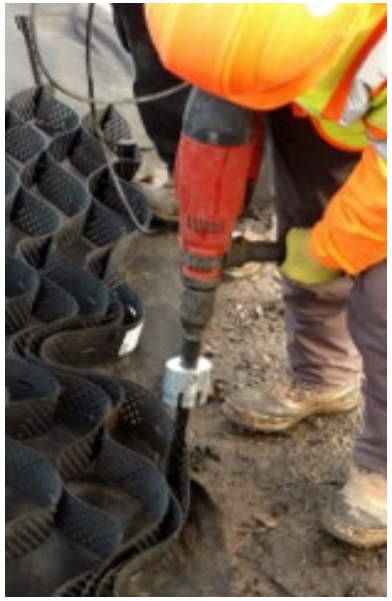

ATRA® Anchors & Drivers

LEARN MORE

Corrosion-Resistant Anchors

Speed Stakes & Glass-Fiber Reinforced

Strongest hold-down; most secure cell wall connection.

ATRA® Anchors & Drivers

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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

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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.

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Complete our Online Form

Get a Quote

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GEOWEB®

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!