

PRESTO



GEO SYSTEMS[®]

GLOBAL LEADER • GLOBAL PARTNER

**Geo-Coastal
Engineering Ltd**

smart earth solutions

■ SOIL STABILIZATION ■ POROUS PAVEMENTS ■ PORTABLE MATS





*our commitment:
providing the highest quality
products/solutions*

A RICH HISTORY OF INNOVATION. Presto GEOSYSTEMS' long history of creating innovative products started as a partnership project with the US Army Corps of Engineers in the early 1980's, resulting in the development of the original "geocell" technology.



GEOSYSTEMS®

WHO WE ARE

PRESTO GEOSYSTEMS® leads the stormwater and site development industry with eco-friendly, custom-tailored solutions to meet the most demanding soil and water problems.

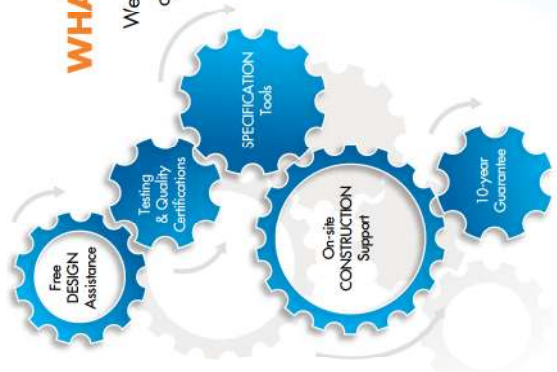
We have been manufacturing high-quality, innovative products for over thirty years. Our proven solutions are designed to handle unique challenges, save cost, and reduce construction time with minimal environmental impact. Our products are backed by stringent research, internationally recognized testing and quality processes, ensuring high-performing and long-lasting solutions.



- Innovative Solutions
- First in Class Quality Products
- Proven Design Methodologies
- Customized Design Solutions
- World Class Research & Testing
- Reduced Cost Alternatives
- Global Distribution Network

WHAT WE DO

We are committed to the complete project cycle. We invest with partner engineers, contractors and owners to solve their site challenges. Our value starts with design assistance and we stay with you through project completion.



QUALITY DRIVEN. We hold ourselves to the highest quality standards. Presto Geosystems' quality management system is certified to ISO 9001:2008 and CE quality standards.

SOLUTIONS PORTFOLIO

Presto GEOSYSTEMS® manufactures high quality products for meeting the most challenging soil stabilization, stormwater and site access needs.

SOIL STABILIZATION

Presto is the original inventor of the three-dimensional geocell technology with the US Army Corps of Engineers.

Presto's high-quality, **Genuine GEOWEB® system** continues

- to improve:
 - Textured surface, perforations and tendon slots.
 - ATRA® load transfer clips and tendons.
 - ATRA® connection keys, ATRA® stake clips, ATRA® anchors, and ATRA® drivers.

POROUS PAVEMENTS

Presto's quality solutions create grass and aggregate porous pavements for pedestrian and vehicular traffic use. The permeable systems deliver structural support for traffic loads and provide stormwater drainage benefits.

- **GEOLOCK®** system protects turf for occasional-use pavements.
- **GEOPAVE®** system stabilizes open-graded aggregate pavements.
- **GEOWEB®** system stabilizes aggregate or aggregate/topsoil mix for economical aggregate and vegetated pavements.

PORTABLE MATS

Two mat types are available to support construction traffic.

- **GEOTERRA®** mats are extremely strong, lightweight and economical for use over soft subgrades.
- **GEORUNNER®** mats protect turf from concentrated pedestrian traffic or lightweight construction vehicles and equipment. They are also ideal for scour protection applications.

GENUINE GEOWEB®



■ THE HIGHEST QUALITY ORIGINAL GEOCELL

The **GEOWEB® cellular confinement system** is the original geocell developed by Presto GEOSYSTEMS® and the US Army Corps of Engineers more than 30 years ago for solving challenging soil stabilization problems.

■ HIGH QUALITY STANDARDS

The Genuine GEOWEB® system has always been manufactured in the USA from high-quality, high-strength polyethylene so quality and performance are always dependable. The manufacturing process adheres to stringent ISO and CE quality standards.

GEOWEB® oval wall slots are designed for quick section connection with ATRA® keys and for threading of tendons.



4 GEOWEB® Main Application Areas

LOAD SUPPORT:

- Solves roadway, parking and yard surface problems using less costly infill and less base, allowing for reduced infill and base material costs.

SLOPE PROTECTION:

- Creates a stable environment for vegetation and long-term sustainability of embankment material. Provides 3-dimensional lasting slope protection.

CHANNEL PROTECTION:

- Ensures stability and protection of vegetated, aggregate and concrete-lined channels exposed to both slope and channel flow erosion.

VEGETATED RETAINING WALLS:

- Creates economical, vegetated retaining walls that thrive and last even in settling conditions.



Infill type varies from vegetation to aggregate and hard-armed concrete.



MARKETS AND INDUSTRIES

We partner with engineers, consultants, contractors and owners around the globe. Our solutions solve soil challenges in many diverse areas of site construction:

- Infrastructure
- Mining Industry
- Oil & Gas Industry
- Railroad Industry
- Stormwater & Wastewater
- Transportation
- Wind Energy
- Green Building

Presto's many quality products add value by minimizing environmental impact and offering cost-effective means for creating sustainable, long-term solutions that hold up over time. With reduced life-cycle cost, sustainability, environmental and aesthetic benefits, we offer solution choices to best meet our customers' needs.



A Guide to QR Codes: Use your Smartphone or Tablet with a QR code reader to link to the website pages in each section. We suggest the free QR reader app Reclaser.

GEOWEB® SLOPE PROTECTION



The **GEOWEB® Slope Protection System** offers solutions for solving challenging slope stability problems. The 3D structure creates a stable environment for embankment infill materials, preventing severe erosion problems and offering deep earth solutions not delivered by surface treatments.

■ SUSTAINABLE SLOPE STABILITY

The benefits of 3D confinement are long-term vegetated sustainability, reinforcement of the upper soil layer and resistance to erosive conditions and sliding forces.

The **GEOWEB®** system offers long-term protection of embankments of all types:

Sustainable Vegetation:

The system reinforces vegetation, increases resistance to erosive forces and prevents rill development caused from concentrated flows.



GEOWEB® LOAD SUPPORT



The **GEOWEB® Load Support System** is a proven, economical solution for challenging soil stability problems. The 3D structure delivers benefits where soft soils are present, where inexpensive quality infill is unavailable or where traditional reinforcement methods are difficult to construct.

■ THE 3D GEOWEB® STRUCTURE ADVANTAGES

- Confines and stabilizes infill material and controls shear, lateral and vertical movement.
- Increases the effective structural number, allowing fill requirements and costs to be cut in half.
- May allow use of lesser-quality, less costly on-site infill materials.
- With permeable infill, is a **porous pavement** that reduces stormwater runoff and minimizes environmental impact.

■ GEOWEB® LOAD SUPPORT BENEFICIAL VALUE

- Load distribution system over weak soils
- Decreased rolling resistance
- Base stabilization for paved surfaces
- Rutting control for unpaved surfaces
- Maintenance reduction



GEOWEB® Research Results

The **GEOWEB®** load support system:

- reduces the **thickness and weight of structural support elements by 50% or more.**
- allows subgrade materials to withstand more than **10 times** the number of cyclic-load applications before accumulating permanent deflection.
- provides over **30% stress reduction** when used as a supporting layer under pavement.
- distributes load between pilings reducing **intersoil stress by 40%.**



GEOWEB® Key Applications

- Haul and Site Access Roads
- Laydown Yards/Drilling Pads
- Permeable, Load-Supporting Surfaces
- Intermodal/Port Facilities
- Transportation/Bulk-Handling Yards
- Roadway Shoulders
- Railroad Track Ballast/Subballast Structures
- Stabilized Base for Asphalt
- Trails and Walkways
- Boat Ramps and
- Low Water Crossings



Typical GEOWEB® Slope Protection Applications

- Vegetated & Permeable Embankments
- Geomembrane Protection
- Stormwater Basins & Wastewater Lagoons
- Shoreline Revetments
- Dikes & Levees
- Abutment Protection
- Landfill Linings & Covers
- Dam Faces & Spillways



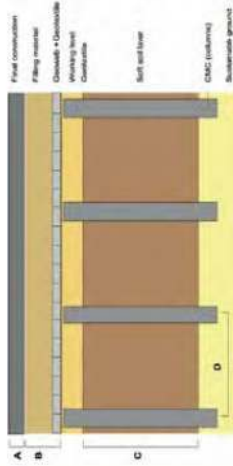


■ SOIL STABILIZATION

■ **GEOWEB® LOAD-TRANSFER PLATFORMS (LTP)**

As a result of its proven load distribution characteristics, the GEOWEB® Load Transfer Platform (LTP) system effectively bridges loads and transfers to columns, allowing greater spacing of piles than with traditional concrete pile cap systems. The high load transfer system results in a reduction in the number of piles/ columns required and a reduction in overall cost.

The GEOWEB® LTP system transfers the applied load to the vertical columns more efficiently by acting as a semi-rigid slab and is especially beneficial over soft soils. Compared to other geosynthetic solutions for minimizing columns, the GEOWEB® LTP system can be constructed with less expensive sand infill instead of aggregate/gravel and can be placed without the need for low pressure earth moving equipment.



Geoweb Load Transfer Platform (LTP)



■ SOIL STABILIZATION

■ **GEOWEB® TREE ROOT PROTECTION (TRP)**

Critical Root/Tree Protection Zone is the minimum area beneath a tree that must remain undisturbed to preserve a sufficient amount of root mass in order to give a tree a chance of survival.

When construction equipment and vehicles intrude a tree's Critical Root Zone, they can cause negative impacts to the soil environment including compaction of the soil, damage to near-surface roots and ultimately endanger the structural integrity of the tree. The majority of a tree's root system is contained within the top three feet of the surface, and construction excavation and compaction can damage or even destroy roots to the point where trees may not survive.

■ **PROTECTION THROUGH LOAD DISTRIBUTION**

By distributing and bridging applied loads, the Geoweb TRP system reduces vertical stresses that are typically applied to the underlying soil and root zone. The protection system is especially beneficial in areas where weak subsoil or no-dig restrictions exist.

■ **GEOWEB® ENVIRONMENTAL BENEFITS**

With permeable infill (topsoil/vegetation, aggregate, sand) perforated GEOWEB® cell walls offer environmental benefits:

- water infiltration
- lateral movement of air and water
- water and nutrient migration

■ **BASE STABILIZATION UNDER PAVEMENT**

Our service includes a complimentary project evaluation, an analysis that applies our load support calculation tool *smarDESIGN™*, (limited state analyses and serviceability analyses; according to partial safety concept EC7, German standard DIN 1054 and DIN 4019), three decades of engineering experience, and over 130 data-controlled GEOWEB® in-situ tests.

The Geoweb® LTP application for bridging columns in pile platforms is a patent-protected technology of Solitec GmbH and is powered by Genuine Geoweb® cellular confinement.

GEOWEB® LTP Key Benefits

- The Geoweb system is a semi-rigid slab that provides higher load distribution than traditional pile cap systems, allowing greater spacing of columns.
- Transfers load stresses between and over vertical columns more efficiently to the support system.
- Reduces deflections with an overall reduced construction cross section when compared to traditional pile caps.
- Reduced construction cost and time line



■ **WINDFARM ACCESS ROADS**

GEOWEB® roadways provide a proven, economical solution for site access. The system's 3D structure confines aggregate, reduces rutting and maintenance and has a minimal negative environmental impact.

■ **GEOWEB® BENEFITS**

- reduces overall cross section of aggregate compared to 2D systems; may allow use of on-site or waste fill soils.
- provides a stable driving surface, even over soft ground
- requires minimal maintenance
- reduces environmental impacts on subgrade soils
- can be used under cranes for tower and turbine placement
- transports easily and deploys quickly



GEOWEB® SHORELINE PROTECTION



The **GEOWEB® Shoreline Protection System** stabilizes soils on shoreline embankments, creating a structurally-stable environment for infill. The system minimizes erosion problems caused by water contact, surface flow and small scale wave action.

■ BENEFITS OF THE 3D STRUCTURE:

- Confines and reinforces the upper soil layer.
- Provides resistance to erosive conditions and slip forces.
- May be integrated with a turf reinforcement mat (TRM) for higher protection for vegetation.
- Protects geomembranes on ponds, or stormwater/wastewater containment basins.

■ SUSTAINABLE SHORELINE STABILITY

The **GEOWEB®** system can be designed to provide long-term stability with sustainable vegetation, permeable aggregate or hard-armored concrete.

Vegetated Protection:

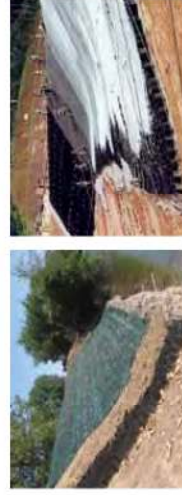
The **GEOWEB®** system with established vegetation protects embankments against mild wave and tidal forces. With a TRM cover, offers better resistance to soil loss caused by soil saturation.

Aggregate Protection:

Confinement in the **GEOWEB®** structure allows smaller, less-expensive materials to be used, and on steeper slopes than when unconfined.

Concrete Hard-Arm Protection:

With concrete infill, the **GEOWEB®** system is a less costly, flexible alternative to articulating block systems.

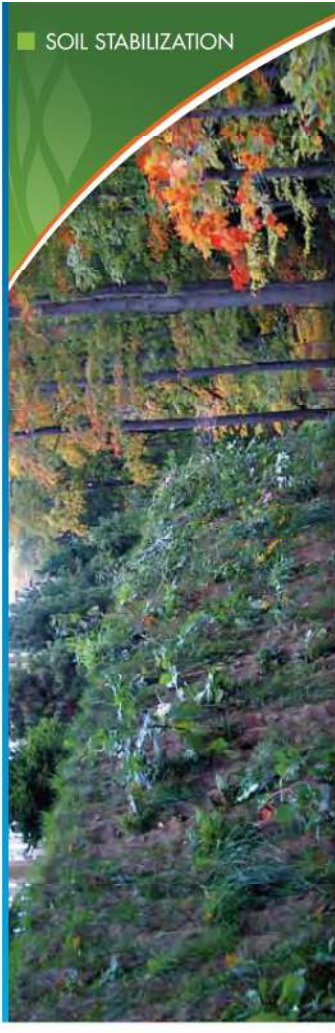


GEOWEB® Key Applications

- Shoreline Revetments & Embankment Protection
- Shoreline Restoration & Bioengineered Solutions
- Geomembrane Protection
- Stormwater or Wastewater Containment Basins
- Seawalls



GEOWEB® EARTH RETENTION



Tiered **GEOWEB® Retaining Wall Systems** are designed for natural aesthetics, and their beneficial advantages are realized with site constraints and less-than-ideal site conditions.

■ STRUCTURAL BENEFITS

The **GEOWEB®** system creates economical and structurally sound retaining walls that perform well when exposed to differential settlement in soft-soil environments. In fact, **GEOWEB®** retaining walls have been exposed to severe earthquakes without sustaining damage. Depending on the design, **GEOWEB®** retaining walls may be constructed with or without geosynthetic reinforcement layers.

■ ENVIRONMENTAL BENEFITS

The **GEOWEB®** retaining wall system's open-celled horizontal terraces create a natural environment for sustainable vegetation. The vegetated system allows rain water to collect through the wall fascia, minimizing runoff. The highly permeable wall surface is a natural Low Impact Development (LID)/Best Management Practice (BMP) for reducing runoff and managing stormwater on site.

■ ECONOMIC BENEFITS

- Use of less expensive on-site infill materials saves cost.
- Construction productivity improvements speed up project completion.
- Compact and lightweight sections are easier to handle, transport and construct, even in difficult access or remote locations.



Typical GEOWEB® Wall Structures

- Steepened Slopes
- Geocomposite Retaining Walls
- Gravity Walls
- Multi-layered Channel Systems





The **GEOWEB® Channel Protection System** stabilizes and protects channels exposed to erosive conditions of all types and can be designed with appropriate infill types to withstand even the highest velocities.

■ **CHANNEL OPTIONS:**

Vegetated Protection:

Replaces costly, higher-maintenance rip-rap with lower-maintenance, less expensive, stabilized vegetation. Effective in low-flow channels and when low-to-high intermittent flows occur.

With a TRM, the vegetated **GEOWEB®** system can withstand velocities as high as 30 ft/sec (9m/sec). Ideal for drainage ditches, swales and stormwater channels.

Aggregate Protection:

Aggregate confined in the **GEOWEB®** system is far more stable than when unconfined. As a result, rather than using large, difficult to handle rip-rap, smaller and less expensive infill can be used in low-to-challenging flow conditions.



Concrete Hard-Armor Protection:

Concrete-filled **GEOWEB®** structures are ideal for channels exposed to severe hydraulic stresses. Concrete is poured in the structure onsite, creating an easy-to-install, flexible yet hard-armed system that is less costly than pre-formed concrete systems.



Multi-Layered Protection:

GEOWEB® multi-layered, vegetated channels create natural living retaining walls that can withstand high flows for short durations. They tolerate differential settlement while maintaining their structural integrity, and are quicker and easier to install than typical block systems.



■ **TURN-KEY INNOVATION**

The GEOWEB® connection device

The **ATRA® Key** is an innovation by Presto GEOSYSTEMS® for faster and more cost-efficient construction of **GEOWEB®** projects.

Developed for installation speed, productivity and overall economics, the versatile **ATRA® Key** connects **GEOWEB®** sections with one quick and easy turn. The **ATRA® Key** is suitable for connecting **GEOWEB®** sections through material slots both end-to-end and side-to-side, providing

a more secure load-transfer connection than with other devices.

The **ATRA® Key** is a safe, secure and strong device that offers contractors significant benefits over traditional stapling methods.

The use of **Ara-Keys®** guarantees a proved force-fit connection of 1,200 N per connection (according to DIN 13426-1-2003).

ATRA® KEY



ATRA® Key Benefits

- Eliminates equipment needs and costs
- Easier to maneuver on steep slopes than with stapling operations.
- Transports easily to remote or difficult-to-access locations; requires no electricity
- requires only one worker to connect
- Eliminates potential injury to workers caused by use of pneumatic staplers.
- Lasts longer than staples: Inert polymeric material provides long life



GEOWEB® Key Applications

- Swales & Drainage Ditches
- Storm Water Diversion or Containment
- Process Water Channels or Containment
- Spillways/Downchutes/Drop Structures
- Culvert Outfalls
- Intermittent or Continuous/ Low- to High-Flow Channels





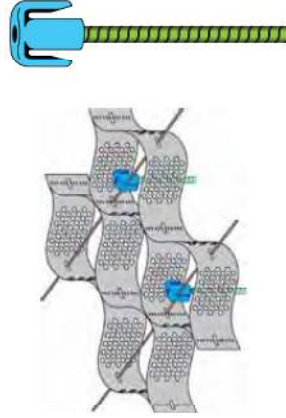
■ ATRA® DEVICES

■ ATRA® ANCHORS

- Drive ATRA® Stake Clips over rebar to create an ATRA® anchor.
- Easier to drive than J-hook stakes, improving installation productivity.
- Provides additional anchorage with or without tendons to resist sliding and/or uplift forces.

■ ATRA® DRIVER

- Considerable time/cost savings when driving large quantities of anchors or in hard soil or difficult environments.
- The ATRA® Driver with a custom ATRA® Gad significantly speeds the driving of ATRA® anchors, improving productivity and reducing installation costs
- When anchored, the flexible system allows full contact with ground over landscape contours.



■ ATRA® TENDON CLIP

- Specially designed for geomembrane covers/hard surface where no stakes are used
- High-performing device to transfer loads from the cell wall to the tendon
- Clips securely lock into GEOWEB® cells, allowing GEOWEB® sections on slopes



GEOWEB® Accessory

- Fast and easy installations
- Cost-efficient constructions
- Secure load transfer connections
- Durable long life materials



■ TECHNICAL DATA

■ GEOWEB® SYSTEM STANDARD SIZES

GEOWEB® sections are available in various cell types and depths, and section lengths to most economically meet project requirements.

Cell Type	GW20V (small cell)	GW30V (mid cell)	GW40V (large cell)
Application	all Applications	Earth Retention	all Applications
Nominal Length x Width	224 x 259 mm	267 x 330 mm	287 x 320 mm
Nominal Area	289 cm ²	440 cm ²	460 cm ²
Percent Cell Wall Open Area (inner cells)	21.2% ± 1.0%	16.8% ± 1.0%	16.8% ± 1.0%
Nominal Depths:	75 mm, 100 mm, 150 mm, and 200 mm for all cells		

Please note: Cell size and depth are determined by the details of the application, problem or desired solution. Please contact your local distributor to get more information.

■ GEOWEB® SECTION SIZES

Cell Type	GW20V (small cell)	GW30V (mid cell)	GW40V (large cell)
Dimension standard section (l x w), variable	6.70 x 2.60 m	8.30 x 2.60 m	13.70 x 2.60 m
Area	17.00 m ²	21.50 m ²	35.00 m ²
Dimension roadway shoulder (height 150 mm)	8.70/ 9.00 x 0.60 m 8.70/ 9.00 x 1.00 m	Not available	Not available
Dimension earth retention (w x l) (height 150 mm)	Not available	0.80 x 2.64 m 1.07 x 2.64 m 1.33 x 2.64 m 1.60 x 2.64 m	Not available



FIND US | FOLLOW US

We are a global business with accessibility through a worldwide distribution network.



PRESTO GEOSYSTEMS®
Appleton, Wisconsin, USA



SOILTEC GmbH:
Neue Finien 7a
28832 Achim
Germany

Tel.: +49 4202 7670-0
Fax: +49 4202 7670-50
E-Mail: geosystems@soiltec.de

www.soiltec-geosystems.de

DISTRIBUTED BY:



Lucan, Co. Dublin, Ireland

Tel: 01-9060333 Email: info@geo-coastal.ie
Web: www.geo-coastal.ie

GEOSYSTEMS®, GEOWEB®, GEOBLOCK®, GEOPAWE®, GEOTERRA®, GEORUNNER®, PADLOC® and ATRA® are registered trademarks of Reynolds Presto Products, Inc. GEOWEB® over Columns/Piles is a patent application of SOILTEC Geosystems, Germany and licensed to MENARD Soltraitement, France. smartDESIGN™ is a trademark of SOILTEC Geosystems, Germany. LEED® is a registered trademark of the US Green Building Council. This information has been prepared for the benefit of customers interested in Presto GEOSYSTEMS® products. It was reviewed carefully prior to publication. Presto assumes no liability for its accuracy or completeness. Final determination of the suitability of any information or material for the use contemplated, or for its manner of use, is the sole responsibility of the user.