



**GEOSYSTEMS®**

GLOBAL LEADER • GLOBAL PARTNER



*creating  
sustainable  
environments®*



# **GEOWEB®**

*channel protection*

APPLICATION OVERVIEW

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

*eco-economic solutions for channel protection*



**GEOWEB®**  
MADE IN THE USA

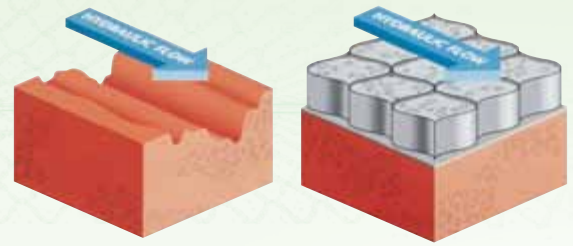


# *the GEOWEB® system*

## LOW-COST CHANNEL PROTECTION SOLUTIONS

The Presto GEOWEB® system provides a wide variety of economical, flexible protection treatments for open channels and hydraulic structures. The system provides stability and protection of channels exposed to erosive conditions ranging from low-to-high flows, either intermittent or continuous.

- Greatly improves the hydraulic performance of conventional protection materials such as aggregate, rip-rap and topsoil/vegetation by confining them within the cellular structure.
- With concrete infill, produces a flexible slab for a long-lasting armored channel lining at a lower cost than articulating block systems.



- Can be designed for specific site conditions based upon compatibility with local environmental, ecological and aesthetic requirements, maximum anticipated flow conditions, and associated hydraulic stresses.
- Surface roughness and hydraulic efficiency of the lining system can be changed to control flow.

## *GEOWEB® system benefits*

- Cost-effective structure confines selected infill material to resist anticipated hydraulic flows and associated stresses.
- Supports vegetation in low-to-high intermittent flow channels.
- Allows the use of on-site aggregates in low-to-moderate flow channels, reducing construction costs.
- Provides protection to geomembrane-lined channels and containment systems.
- With concrete infill, provides flexible, inexpensive hard-armored protection against severe high-flow conditions, wave action and associated stresses.

## *infill options*

A variety of infill materials can be used with the GEOWEB® system based upon the requirements of the specific project/problem.

- Topsoil with various selected vegetation.
- Aggregates of varying size and gradation.
- Concrete of various strengths and surface finishes.
- Combinations of the above to meet special conditions.

## TYPICAL APPLICATIONS:

- swales and drainage ditches
- storm water diversion or containment
- process water channels or containment
- spillways/down chutes/drop structures
- culvert outfalls
- intermittent or continuous/low to high flow channels







## vegetated protection

Topsoil and vegetation within the GEOWEB® system is ideal for areas where low-to-high intermittent flows occur and can protect in high flow conditions when combined with turf reinforcement mats, or other components. Ideal in swales, ditches and storm flow zones of large channels.

The GEOWEB® cell walls form a series of check-dams extending throughout the channel protection system. Rill and gully development, produced when concentrated flow cuts into the soil, is controlled since flow is continuously redirected to the surface. In cases of possible concentrated or very high flows, a turf reinforcement mat may be recommended over the GEOWEB® sections to provide resistance against hydraulic forces up to 30 ft/s (9 m/sec).

## aggregate protection

Aggregate is an economical natural option in low-to-moderate flow channels. Confined aggregate is more stable than unconfined, allowing its use in higher velocity flow conditions.

- May allow the use of more economical on-site material.
- Less-costly and easier-to-place small aggregate can be used instead of larger rip-rap.
- Aggregate is ideal in arid areas where vegetation may not naturally develop.

### STABILIZING VEGETATED TOPSOIL WITHIN THE GEOWEB® SYSTEM:

- Confines the upper soil layer and protects channels from hydrological erosive forces.
- Reinforces topsoil and vegetation and increases its resistance to erosive forces, protecting the root zone from loss of soil particles.
- Underlying non-woven geotextiles and surface treatment erosion control blankets or turf reinforcement mats may be system components.
- Roots interlock through the perforated cell walls, reinforcing and anchoring the entire protection system.
- Confinement and anchorage of the root structure increases both the shear resistance and the permissible flow duration.





## armoring: concrete protection

Poured concrete provides hard, durable protection for channels exposed to severe hydraulic or mechanical stresses. More economical than most hard-armored systems, the GEOWEB® system prevents uncontrolled cracking of the concrete and reduces the potential of piping or undermining. Hydrostatic pressures are relieved by incorporating underlying geotextiles and/or ground water outlet ports where needed. Critical velocities, Manning's "n" and other hydraulic design parameters have been established for the GEOWEB® channel protection system.

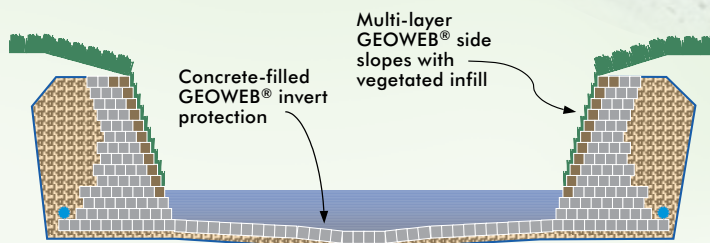
### SYSTEM BENEFITS WITH CONCRETE INFILL:

- More cost-effective than articulating concrete block systems.
- Reduces construction costs by eliminating the need for conventional structural forms. Installation is fast, efficient and flexible, and requires no heavy equipment to construct.
- Develops a flexible slab that conforms to minor subgrade movement.
- Controls concrete quantities and costs with a uniform system-defined cell depth.
- Accommodates the concrete quality, surface finish and thickness to meet specific design needs.

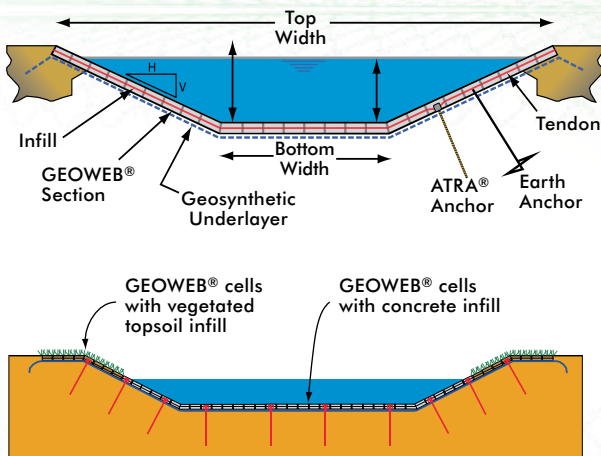
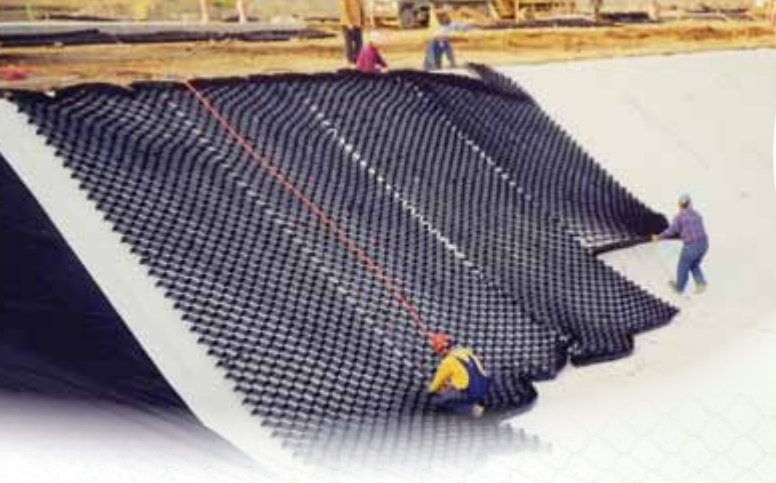
## multi-layered protection

Stacked GEOWEB® sections along channel side slopes with vegetative outer-cell infill offers a natural appearance and the ability to withstand higher flows for short durations. This configuration can tolerate reasonable differential settlement without loss of system integrity, and provides a steeper profile, reducing unwanted consumption of valuable land.

- Colored face panels add natural aesthetics to the system to blend with the environment.
- GEOWEB® sections can be wrapped with coir fabric to reduce potential for soil loss in the outer fascia cells while vegetation is being established.
- A concrete grout or infill can be applied in areas of anticipated high energy water impact, or combination of infills can be used to accommodate various flow rates.







## key components

The complete GEOWEB® channel protection system may include some or all of the following:

- GEOWEB® sections
- Cell infill materials
- Integral high-strength polymeric tendons
- ATRA® Clips/Anchors
- ATRA® Key Connection Device
- Erosion Control Blankets
- Turf Reinforcement Mats
- Geotextiles
- Geocomposite drainage materials
- Geomembrane

## integral system components

The following components may be integrated to facilitate and expedite construction or to meet engineering requirements:

### TENDONS

Tendons may be required and are available in various tensile strengths to meet design requirements.

- Provide additional stability against gravitational, hydrodynamic, and buoyancy forces.
- Particularly effective where high flows exist, or when a geomembrane underlayer or hard soil/rock prevents anchoring with stakes.

### ATRA® ANCHORS

Presto's ATRA® Anchors provide time and material cost savings during installation of the GEOWEB® system. (1)

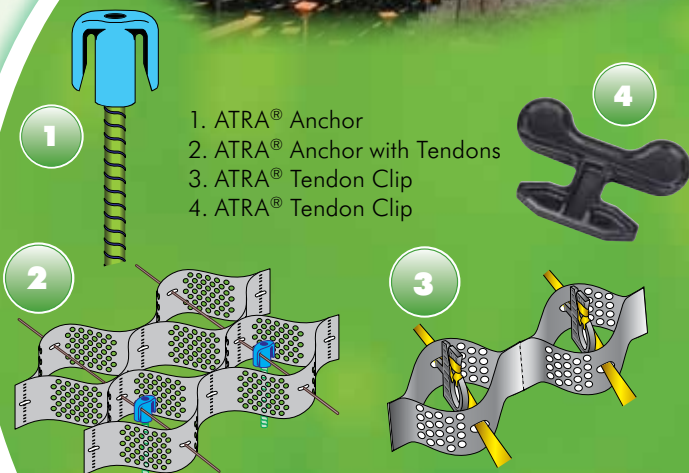
- Easier to drive than J-hook stakes; significantly improves installation productivity.
- Tendons and an ATRA® Anchor array provide additional anchoring to resist sliding and/or uplift forces. (2)
- Specialized driving tools are available to significantly speed the driving of anchors.

### ATRA® TENDON CLIP

The ATRA® Tendon Clip is an efficient load-transfer device to transfer loads from the GEOWEB® cell wall to the tendon. Fully engaged clips allow easier preassembly. (3)

### ATRA® KEY CONNECTION DEVICE

For quick and easy connection of GEOWEB® sections, the exclusive ATRA® key device reduces contractor installation cost and provides three-times-stronger connections. (4)



# comprehensive tools and services

Presto GEOSYSTEMS® and our distributors/representatives offer the most complete services in the industry to support project design and installation requirements.

## TOOLS:

- Technical resources binder
- Engineering analysis/technical overviews
- SPECMAKER® specification development tool
- Project case studies
- Detailed construction instructions

## SERVICES:

**Project Evaluation Service:** We analyze specific project needs and provide recommended preliminary designs for each project.

**Construction Services:** Qualified on-site field support specialists can be available for construction training, and start-up installation supervision.



## PRESTO GEOSYSTEMS® COMMITMENT — To provide the highest quality products and solutions.

Presto GEOSYSTEMS® is committed to helping you apply the best solutions to your soil stabilization problems. Our solutions-focused approach to solving problems adds value to every project. Rely on the leaders in the industry when you need a solution that is right for your application. Contact Presto GEOSYSTEMS® or our worldwide network of knowledgeable distributors/representatives for assistance.

## LEADING-EDGE INNOVATION

Presto is the original developer of the cellular confinement technology and leads the industry in research and development resulting in meaningful product improvements, innovative features, advanced engineering methodologies, proven field results and ultimately long-term solutions to challenging problems.

## UNSURPASSED QUALITY

Presto's commitment to quality begins with manufacturing and continues through final installation.

- Quality management system certified to ISO 9001:2008 and CE Certification.
- Sections manufactured from high-quality polyethylene provide consistent and maximum seam weld strength.
- Materials engineered to established geosynthetic industry guidelines.
- Sections backed by a 10-year limited warranty.



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