GEOWEB® slope protection solutions
LOW-COST SLOPE STABILITY SYSTEM
The Presto GEOWEB® slope and shoreline protection system is an economical solution to challenging slope-surface stability problems while meeting a wide range of performance and aesthetic requirements. The system provides a means of fully vegetating slope surfaces that otherwise could not support sustainable plant life.

GEOWEB® system benefits
- The three-dimensional structure confines selected infill material to resist down-slope movement of embankment materials and anticipated hydraulic flows.
- Minimizes the movement and migration of embankment materials by functioning as anchored containers in the upper soil layer.
- Increases vegetation stability on slopes by interlocking with the vegetative root zone, or confining and interlocking aggregate or concrete for permeable or hard-armored solutions.
- Directly protects the geomembrane from wildlife damage, particularly in areas of concentrated flow over erode soils.
- Indirectly prevents soil contamination and erosion.
- Protects the shoreline against degradation caused by hydraulic forces, including ice and wave action.
- Where appropriate, the system creates a flexible hard-arm cover to protect the shoreline against undermining.
- Prevents rill development caused from concentrated flows.
- Enhances effectiveness of other surface treatments such as erosion control blankets and turf reinforcement mats.
- Minimizes down-slope migration of granular materials.
- Reduces construction costs by eliminating the need for conventional concrete-armored slopes.
- Controls concrete quantities and costs through a uniform, system-defined cell depth.
- Articulating block systems.
- Accommodates a wide range of slope angles by selecting the appropriate cell size and cell depth for the considered aggregate.
- Provides a controlled mechanism to effectively handle seepage.
- Creates a permeable, weatherproofing cover when drainage is desired but vegetation is not.
- Provides a means of fully vegetating slopes that are exposed to severe hydraulic or mechanical stresses.
- The quality, surface finish and thickness of the concrete can be selected to meet specific design needs.
- The system’s interconnected cell structure significantly improves the stability and erosion-resistance of granular materials. Confinement of the infill allows smaller, less-expensive materials to be used.
- Pouring concrete provides an economical, hard-armored solution for permeable aggregate slopes and flatwork.
- Single or multi-layered systems offer a broad range of surface protection treatments. The systems provide long-term stability and effectiveness of vegetated, permeable and armored slope surfaces.

infill options
A variety of infill materials can be used with the GEOWEB® system based upon the details of the specific project/problem.
- Topsoil with various selected vegetation.
- Aggregates from sand and gravel to larger rock or stone.
- Concrete of various strengths and surface finishes.
- Combinations of the above to meet special conditions.
- Confinement of the upper soil layer and protection from the effects of erosion.
- Reinforces vegetation and increases its resistance to erosive forces.
- Topsoil or vegetation infill controls the movement of saturated soils so natural vegetation can flourish.
- Poured concrete provides an economical, hard-armored solution for permeable aggregate slopes and flatwork.

Typical applications:
- Cut or fill embankment slopes
- Containment dikes and levees
- Shoreline revetments
- Geomembrane protection
- Landfill, leach, cover, and drainage
- Storm water basins
- Waste water lagoons
- Drain bases and shoulders
- Abutment protection
vegetated protection

Vegetation is a natural, attractive and effective form of protection for slopes exposed to surface degradation.

The GEOWEB® system creates a structural soil stabilization system, protecting embankments against the negative effects of gravitational forces and loss of topsoil and vegetation.

shoreline protection

Protection of shoreline embankments is accomplished with the GEOWEB® system using infill materials appropriate for the application. Multiple cell depths can be used to best address hydraulic conditions. With concrete infill, the system creates a flexible hard-armored cover to protect the shoreline against degradation caused by hydraulic forces, including ice and wave action. Where appropriate, topsoil or vegetation infill controls the movement of saturated soils so natural vegetation can flourish.

geomembrane protection

The GEOWEB® system, with various infill materials, is an effective protective layer over impermeable geomembranes:

- Stormwater detention and retention ponds
- Landfill leachate
- Waste water containment
- Channel linings

The integration of a geosynthetic anchoring system creates a suspended, structural support system that:

- Maintains the integrity of the geomembrane liner or cover
- Directly protects the geomembrane from wildlife damage, accidental puncturing and natural degradation
- Indirectly prevents soil contamination and erosion
**permeable aggregate slopes**

The GEOWEB® system's interconnected cell structure significantly improves the stability and erosion-resistance of granular materials. The cell allows smaller, less-expensive materials to be used.

**STABILIZING AGGREGATE WITHIN THE GEOWEB® SYSTEM:**

- Minimizes down-slope movement of granular materials caused by gravitational and hydraulic forces.
- Permits their use on steeper slopes that would otherwise be impossible, reducing use of valuable land space.
- Creates a permeable, waterproofing cover when drainage is desired but vegetation is not.
- Provides a controlled mechanism to effectively handle seepage.

A wide range of slope angles can be accommodated by selecting the appropriate cell size and cell depth for the considered aggregate.

**concrete-armored slopes**

Poured concrete provides an economical, hard-armored protection of slopes that are exposed to severe hydraulic or mechanical forces. The quality, surface finish and thickness of the concrete can be selected to meet specific design needs.

**STABILIZING CONCRETE WITHIN THE GEOWEB® SYSTEM:**

- Cost-effective and flexible alternative to more expensive articulating block systems.
- Reduces construction costs by eliminating the need for conventional structural forms. Installation is fast, efficient and flexible.
- Controls concrete quantities and costs through a uniform, system-defined cell depth.
- Flexible slab conforms to minor subgrade movement, prevents uncontrolled cracking of the concrete and reduces the potential of piping or undermining.
key components

The complete GEOWEB® slope and shoreline protection system may include some of the following:

- Geoweb® sections
- Cut-fill materials
- Integral high-strength tendons
- ATRA® clips
- ATRA® Anchors
- ATRA® Key Connection Device
- Tendon Clip
- Geosynthetic
- Uplift

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 anchorage 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 pressurability. (3)
**TENDON CLIP**

Easier to drive than J-hook stakes; significantly improves device to transfer loads from the GEOWEB savings during installation of the GEOWEB. Tendons and an ATRA anchor array provide additional anchoring to resist sliding and/or uplift forces. (2) Anchors provide time and material cost savings during project construction or to meet engineering requirements: Tendons may be required and are available in various tensile strengths to meet design requirements. (3) Particularlly effective where high flows exist, or when a device is required to provide additional stability against gravitational, hydrodynamic, and buoyancy forces. (4) Key connection reinforcing device reduces contractor installation connections. (4) For quick and easy connection of GEOWEB® sections, the exclusive ATRA® Anchor with Tendons, the key device reduces contractor installation connections. (4)

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**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.

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**MADE IN THE USA**

GENUINE GEOWEB® invented and made in the USA.