

Solving Earth Retention Problems

Geoweb[®] Cellular Confinement System



Partnering Ideas into Solutions[®]

Earth Retention



An Engineered Framework for Earth Retention

The Presto Geoweb® Cellular Confinement System

Product innovation has always been the key to success for Presto since the company's first involvement in developing cellular confinement technology back in the late '70s. Working in cooperation with the U.S. Army Corps of Engineers, Presto developed the Geoweb® cellular confinement system.

The Geoweb system is an engineered, expandable, polyethylene, honeycomb-like cellular structure that dramatically improves the performance of infill materials. The system is utilized in the areas of slope protection, channel protection, load support and earth retention.

Today, the Presto Geoweb system is the only fully-engineered cellular confinement system available, and Presto Geosystems® materials lead the way in advanced research, testing, field evaluation and geocell product innovations. Successful installations of the Geoweb system can be found worldwide, and the network of Presto Geosystems distributors spans the globe.

ISO-Certified Quality

Extensive research and testing by academic and independent laboratories, ISO 9001:2000 certification, and over fifteen years of in-ground performance tell the story: The Geoweb system provides proven quality and reliability.

Presto's commitment to quality begins with manufacturing and continues through final installation. Our quality management system is certified to ISO 9001:2000 and materials are specifically engineered in accordance with established geosynthetic industry guidelines. All phases of manufacturing are monitored through Statistical Process Control which documents each step in the production process. Geoweb sections are warranted by Presto against manufacturing defects. Copies of Presto's warranty are available from Presto or an authorized Presto Geosystems distributor.

Advanced Product Development

Engineering advancements are on-going at Presto Geosystems and lead to improved cellular confinement systems. Geoweb system advancements include the introduction of both perforated and non-perforated textured Geoweb cells, the use of integral, high-strength tendons and the ATRA™ Anchoring System. The Geoweb system is also available in a variety of colors for better blending with the surrounding project site environment.

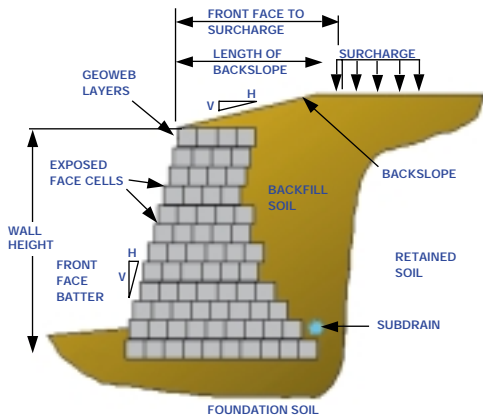
The Geoweb system's unique seam weld pattern is designed to provide maximum strength. The Geoweb system meets and exceeds the rigorous seam strength tests established by the U.S. Army Corps of Engineers. The Geoweb system's long-term seam strength is designed for project longevity.



Geoweb® Earth Retention System - The Key Components

The complete Geoweb® cellular confinement system application will include some or all of the following:

- Geoweb sections
- Cell infill materials
- Fasteners
- Geotextiles
- Geocomposite drainage materials
- Geogrids and geotextile reinforcement
- Geomembrane



Colored Facing

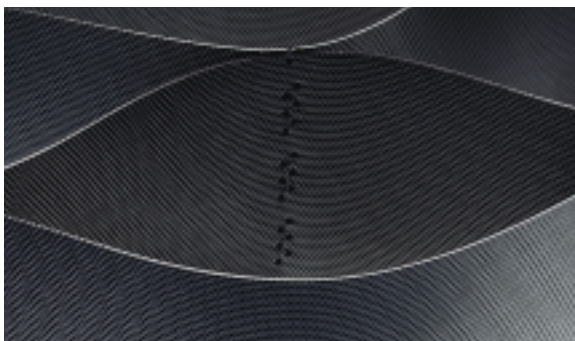
The Geoweb system can be provided in a variety of colors to meet desired aesthetic requirements. The system is available in natural colors of black, green or tan. Coloring pigments contain no heavy metals and the polyethylene is ultraviolet light stabilized with carbon black or Hindered-Amine Light Stabilizer (HALS) to resist color fading and increase system durability.

Versatile Cell Wall Options

The Presto Geoweb Cellular Confinement System is available in two distinct cell wall types: perforated and non-perforated. Both have an engineered textured pattern of indentations that increase friction between the cell wall and infill material.

The perforated Geoweb cell wall provides increased friction with aggregates as well as allowing lateral drainage through the system, thereby enhancing performance of the Geoweb system in saturated conditions. The textured surface works particularly well with finer grain infill.

The Geoweb material generally recommended is a non-perforated colored facia with perforated internal cells.



Size and Facia Options

Geoweb® cellular confinement sections are available in various lengths addressing the specific needs of the wall design, including height, soil characteristics, surcharge loads, etc.

The section is generally oriented so that its end (the cell surface) forms the facia of the wall. Horizontal terraces are formed between layers where vegetation can flourish in the exposed soil in the outer cells. Optional colored facia panels allow natural blending with the environment.

Earth Retention Solutions

The use of earth retention structures has expanded in recent years as transportation and highway upgrades require steepened slopes to accommodate existing rights-of-way. In addition, the development of prime industrial, residential and commercial property has spilled over onto sites requiring additional improvement. The Geoweb cellular confinement system has been specifically developed to meet the challenges of change-in-grade construction, even when the subgrades are comprised of compressible soils. The Geoweb system's versatility provides many earth retention solutions, including:

- Widening within existing rights-of-way
- Adding a lane of traffic or parking
- Grading development sites to boundary limits
- Providing truck or emergency vehicle access
- Expanding sports fields and storage yards
- Reshaping and stabilizing storm water channels
- Building storm water retention structures
- Repair of failed slopes and retention structures
- Safety barriers along transportation corridors
- Energy absorbers
- Noise abatement walls

The primary function of an earth retention structure is to provide a very steep or vertical surface which minimizes erosion and is structurally stable under its self-weight and known externally imposed loads. The near vertical change in grade requires that earth materials be stacked higher and steeper than their internal shear strength properties will permit. Consequently, the magnitude of lateral earth pressure which these earth structures must resist is directly related to:

- Height of the change-in-grade
- Internal shear strength of the earth materials
- Geometry of slope above the structure
- Magnitude of any imposed surcharge loading

Key criteria for the selection of certain types of Geoweb earth retention structures include the project site soil conditions, availability of suitable backfill materials, project economics and the desired aesthetics of the completed site.





Flexible Design Solutions

The basic Geoweb® system can be adapted to a wide range of design requirements and site conditions. Its extreme versatility results from its inherent flexibility, unique load deformation behavior and suitability for a wide range of infill materials and foundation soils. The Geoweb system can cost-effectively replace many conventional earth retention structures such as:

- Concrete cantilever
- Mechanically stabilized earth (MSE) or earth-anchored
- Soldier pile and lagging with or without tiebacks
- Concrete gravity
- Concrete crib
- Timber crib
- Sheet pile
- Steel bin type



Durability

The Geoweb earth retention system is extremely durable, manufactured from polyethylene material that is resistant to naturally occurring chemicals. The Geoweb system eliminates any potential for cracking, spalling, splintering or corrosion that typically affects concrete, steel and timber-based earth retention systems. This makes the system very adaptable to structures which are exposed to sea water, extreme pH soils, or road de-icing salts and chemicals.

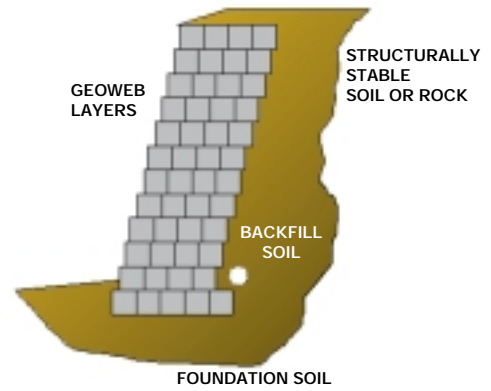
A variety of infill materials can be used with the Geoweb earth retention system. The choice of infill materials is based upon the demands of the specific project/problem. Infill materials include:

- Granular materials such as sand, gravel or graded stone
- Concrete of various strengths and surface finishes
- Topsoil with various selected vegetation



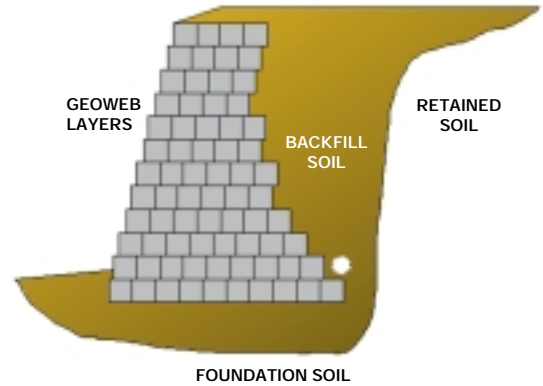
Retaining Walls

The Geoweb® system's multi-layer design makes it very adaptable to specific retaining wall application requirements. Classic methods of stability analysis can be applied, and computerized evaluation is available for a broad range of infill, backfill and surcharge parameters. For the wall exterior, choose from a range of non-structural facias or take advantage of the Geoweb® system's vegetative support capabilities. Simple, effective construction techniques make the Geoweb® system ideal for installations in remote or restricted-access sites.



Gravity Retaining Walls

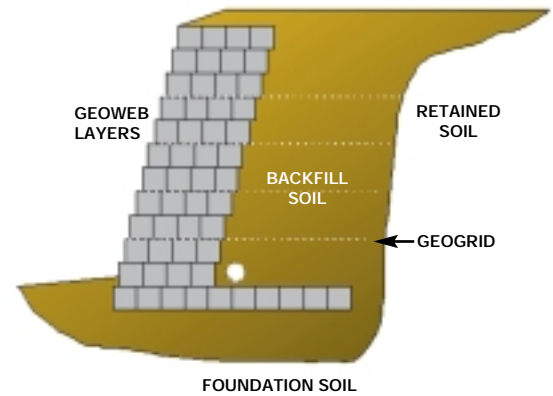
The Geoweb system confines and reinforces granular fill, producing a uniform structural mass that resists lateral pressures and maintains structural integrity. Significant subgrade deformation can occur without loss of structural integrity. Geoweb sections can be used in vertical or stepped designs and with non-structural facias or natural vegetative cover.



Composite Retaining Walls

Cellular confinement with the Geoweb system eliminates the need for expensive structural facia panels. The Geoweb system creates a totally confined wall facing that can be united with the backfill using a variety of tie-back systems. Outer cells can be filled with topsoil to support natural vegetative cover.

The Geoweb retaining wall system is environmentally friendly, blending into the environment with vegetated facings and a choice of natural color face panels. The vegetated face treatment also provides a surface which has noise-absorbing tendencies.

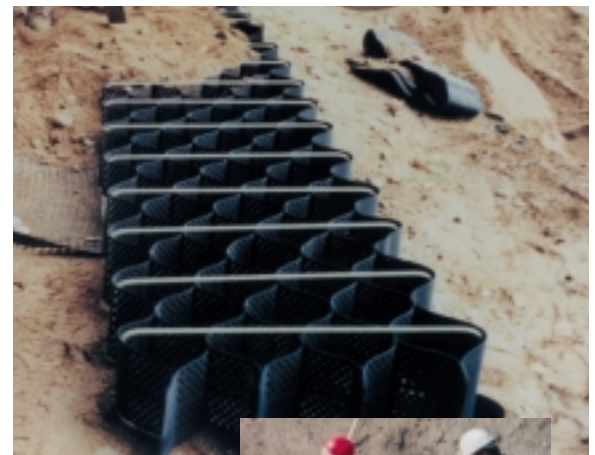


Cost-Effective Option

Geoweb retention structures are cost-competitive with conventional earth retention systems. The installed cost for all earth retention systems will vary with site-specific conditions such as accessibility, soil conditions, cost of infill and compaction, labor rates, surcharge loading, length of wall, etc. Contact Presto or your local representative for more information.

Easy Installation

The Geoweb® system is designed with ease of installation in mind. Geoweb sections collapse into lightweight, compact bundles for easy shipment. During installation, sections remain flexible and easy to handle. Various methods are used for expanding the Geoweb sections. Stretcher frames or bars are typically used to assist in maintaining section shape and location during infilling operations.





Tools & Services

- General Overview - Product data, basic engineering concepts and theory for general application of the Geoweb system.
 - Application Overview - Illustrative project examples using the Geoweb system.
 - Case Histories - Project specific design, construction and performance information for the Geoweb system in all application areas.
 - Design Package:
 - SPECMaker[®] Specification Development Tool - A program used to develop complete material and construction specifications. Available on CD or through Presto's website.
 - System Components Guideline - A set of tables relating to application-specific system components.
 - Presto & CSI - format Material Specifications - Comprehensive guide specification and product description of the Geoweb system.
 - Request for Project Evaluation - A product checklist to insure all relevant data is collected for detailed engineering design of the Geoweb system.
 - Technical Overview - An in-depth discourse centered around the theory and application of theory for solving problems with the Geoweb system.
 - AutoCAD[®] Drawings - Drawings in DWG format and paper copy providing all the engineering details needed for plans with the Geoweb system.
 - Construction Package:
 - SPECMaker[®] Specification Development Tool - A program used to develop complete material and construction specifications. Available on CD or through Presto's website.
 - Installation Guidelines - An illustrated set of installation procedures and construction tips for each application.
 - Videos - Product application and construction techniques videos available in multiple languages.
 - Technical Resources Library CD - All application design and construction documents, AutoCAD[®] drawings, SPECMaker[®] Tool, Power Point[®] presentations, videos and more.
 - Project Evaluation Service - Available through authorized distributors for all applications.
- For more information, call the Presto Technical Assistance Line at (800) 548-3424 or (920) 738-1336.



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