PRESTO | GEOSYSTEMS®

STRENGTH. FROM THE GROUND UP.

Since 1979

GEOWEB® GEOCELLS

EARTH RETENTION SYSTEM

INSTALLATION GUIDELINES

PRESTO GEOSYSTEMS
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Subgrade Preparation

GEOWEB Retaining Walls are utilized to support both cut and fill retention situations. In either case, the subgrade soils that support the structure must be shaped, proof-rolled and trimmed prior to construction of the wall base. In some instances, this may require removal of weak or compressible native soils and replacement with suitable compacted fill.

Base Preparation

- Install the specified geotextile separation layer in accordance with Manufacturer instructions. See Figure 1.
- Place granular base material and compact to 95% of Standard Proctor Dry Density (SPD) using conventional equipment and methods. Note, a lesser density on some granular materials is acceptable.
- If a free-draining granular base (no fines) is specified, encapsulate the base material in a non-woven geotextile.

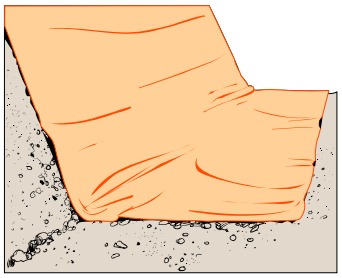

Figure 1 Geotextile Placement

Installation of GEOWEB® Footing Sections

- **Option 1**: For both straight and curved wall alignments, insert a series of individual stretcher bars into the expanded GEOWEB section, position, and fill. See Figure 2 and Figure 12.
- **Option 2**: Expand and fit the GEOWEB section over the dowels of a suitably dimensioned stretcher frame. See Figure 3 and Figure 12. Invert the frame and position the section to receive infill material. When the section is filled, remove the frame, and repeat the process.
- **Option 3**: Expand the GEOWEB section into position and anchor with stakes. See Figure 4.

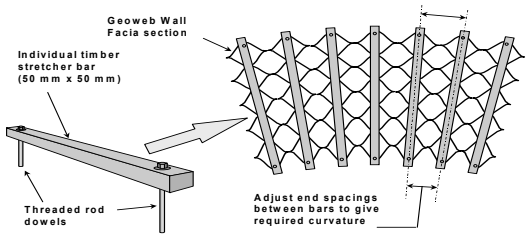

Figure 2 Stretcher Bars for Straight and Curved Wall Sections

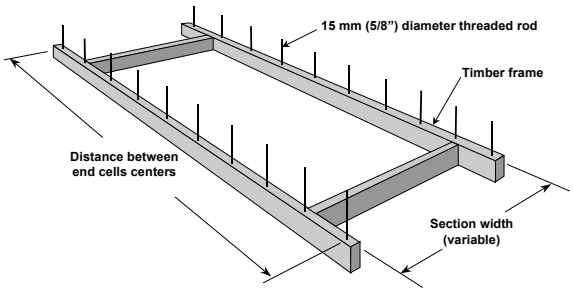

Figure 3 Stretcher Frame

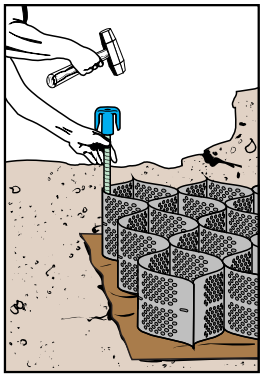

Figure 4 Stake Anchorage

Drainage, Fill Placement, and Compaction

- Typical infilling, compaction, and leveling procedures are shown below and apply to all GEOWEB layers. See Figure 5, Figure 6, and Figure 7.
- Install the specified subdrain and outlet pipes in accordance with contract documents, ensuring that a minimum gradient of 1% is maintained throughout.
- Ensure that the outlet discharge will not cause localized erosion that could undermine the wall.
- Overfill the GEOWEB section and backfill zone with granular material approximately 2 in. (50mm) above the cell walls.
- Compact infill and backfill material to 95% Standard Proctor or as specified using conventional equipment and methods. Note, a lesser density on some granular materials is acceptable. Do not over vibrate the panels to prevent panels lifting from the cell below. Monitor compaction to ensure the panels are not lifting. Panel lifting and outward lateral displacement of wall sections indicates that excessive compaction is occurring.
- After compaction of each lift, remove excess material to expose the top of the cell walls.

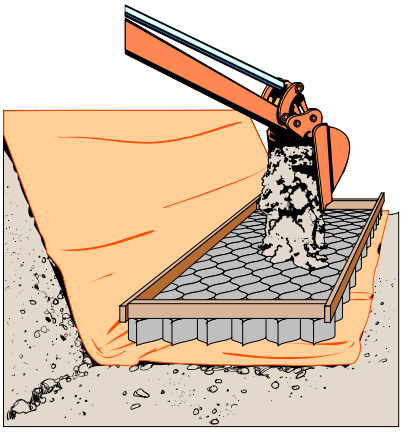

Figure 5 Placing Infill

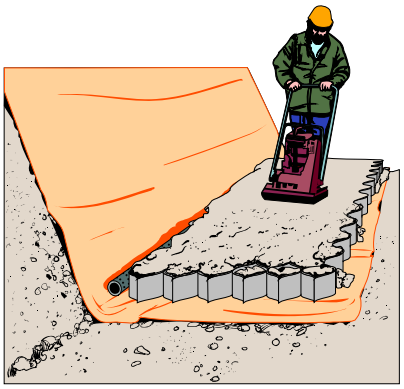

Figure 6 Compacting Infill

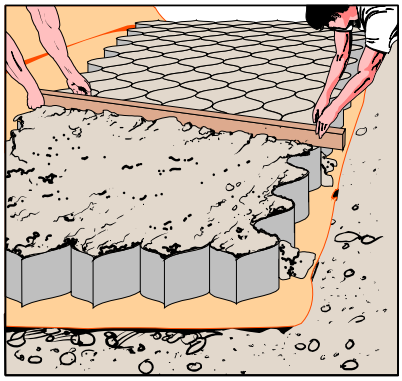

Figure 7 Leveling Infill

Layout and Installation of the GEOWEB Wall Sections

- For each wall layer, position each expanded GEOWEB wall section using either stretcher tools or stakes.
- Align and interleaf the ends of adjoining GEOWEB wall sections and ensure that the upper surfaces of adjoining sections are flush.
- Interleaf edges of adjacent sections and connect with ATRA® Wall Keys.
- Overfill the GEOWEB wall sections with the specified infill material and level to approximately 2 in (50 mm) above the cell wall. (See above)

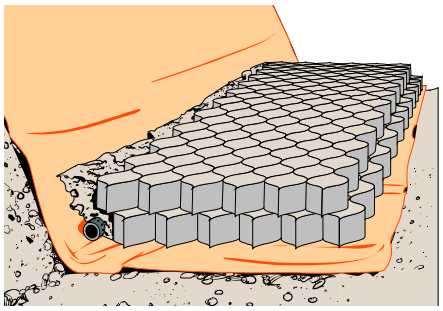

Figure 8 Multi-layer Construction

- The outer cells of GEOWEB walls are frequently infilled with topsoil to support a fully vegetated surface cover. A timber board can be placed over the outer cells during general infilling, and then removed to allow topsoil infilling.
- Compact the infill material to 95% Standard Proctor or as specified using conventional compaction equipment and methods. Note, a lesser density on some granular materials is acceptable.
- Use walk-behind compaction equipment to compact GEOWEB section infill. Avoid the use of heavy compaction equipment within 3 ft. (1m) of the wall sections.
- Do not over vibrate the panels to prevent panels lifting from the cell below. Monitor compaction to ensure the panels are not lifting. Panel lifting and outward lateral displacement of wall sections indicates that excessive compaction is occurring.
- When positioning subsequent layers, ensure 1) that the correct setback of each layer is maintained and 2) that accurate vertical alignment of outer cells is maintained.
- When working on curved walls, subsequent-layer-setback results in a radius change from layer-to-layer that eventually causes cell misalignment. When this is noticed, a correction layer is accomplished by having that layer setback of 6 in. (15 mm).

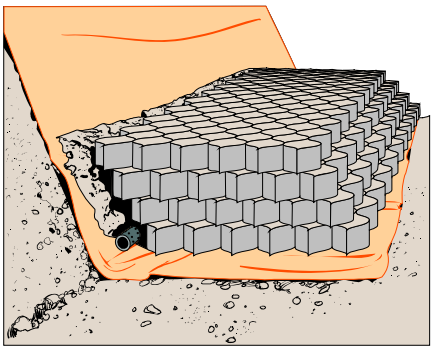

Figure 9 GEOWEB Gravity Wall

Layout of Structures with Stepped Base

Figure 10 illustrates a method of calculating horizontal offset dimensions when constructing a GEOWEB wall on a stepped base. The use of stringlines is recommended to control wall alignment in all situations.

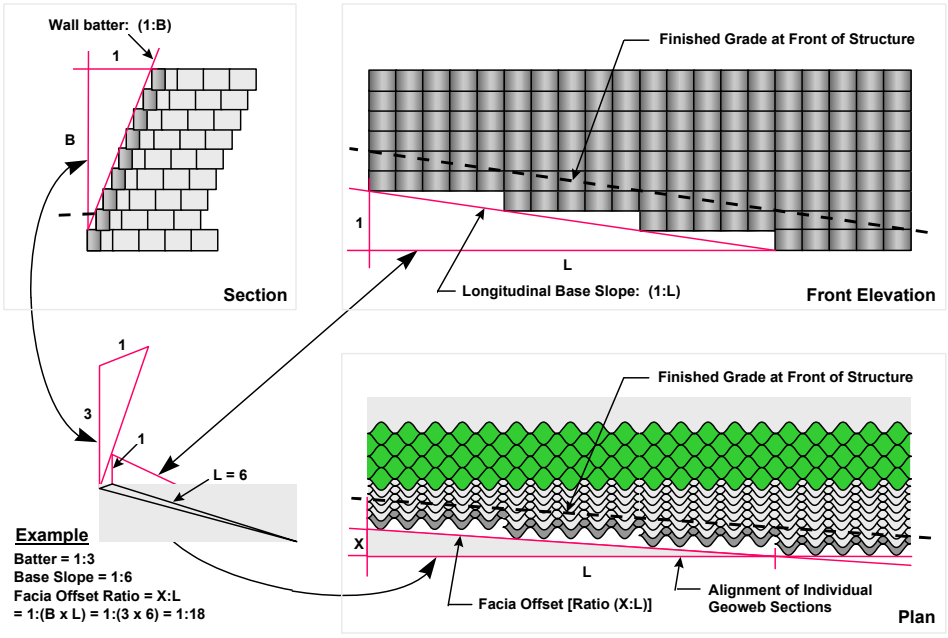

Figure 10 Layout of Structures with Stepped Base

Installation of Geosynthetic Reinforcement (Composite GEOWEB Walls)

Composite walls consist of a reinforced soil mass in combination with a stacked GEOWEB fascia system. The outer edge of each layer of synthetic sheet reinforcement, (geotextile or geogrid), extends between selected GEOWEB fascia layers. This creates a frictional connection between the components.

Standard installation procedures for this type of structure are as follows:

- Fill, compact and level successive layers of GEOWEB fascia sections and associated backfill in the manner previously described.
- At the designated fill elevations, install geosynthetic reinforcement layer with specified strength in accordance with Manufacturer's instructions. Temporarily secure in position with pins or hand-placed fill.
- The outer edge of the reinforcement layer should be positioned within 6 in. (150 mm) of the front face of the GEOWEB fascia sections.

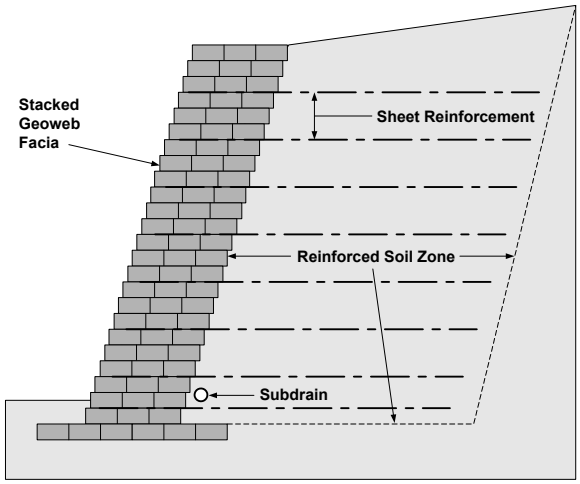

Figure 11 Composite GEOWEB Wall

- Position and fill the next GEOWEB layer over the reinforcement layer and with the proper setback and alignment.
- Manually tension the reinforcement by pulling it back from the infilled GEOWEB wall sections. The reinforcement can be pinned or held taut by hand.
- Place and compact backfill over the extended sheet reinforcement. Rubber-tired equipment can operate directly on the reinforced zone using care to avoid sudden stops and sharp turns. Tracked equipment can operate within the reinforced zone provided that a minimum 6 in. (150 mm) lift of fill has been placed over the reinforcement layer.
- Continue the construction sequence for the balance of the work.

Dimensions and Weights of Palletized GEOWEB® Sections

GEOWEB sections are normally tri-folded and palletized for shipment to the site. Table 1 provides typical pallet dimensions and weights for a range of section and cell sizes. The number of wall panels per pallets will vary based on the cells in length.

Table 1 V-Series GEOWEB Shipping Dimensions and Weights

Cell Depth	*Pallet Dimensions*	*Minimum Weight*	*Maximum Weight*
6 in. (150 mm) and 8 in. (200 mm)	42 in. x 42 in. (1070 mm x 1070 mm)	800 lb. (360 kg)	1,450 lb. (660 kg)

Infill Volumes

Table 2 Infill Volumes for the GEOWEB GW30V Wall Section

Cell Depth	6 in. (150 mm)	8 in. (200 mm)
Volume (m^3 / 100 m^2 of area)	15 m^3	20 m3
Volume (yd^3 / 100 yd^2 of area)	16.7 yd^3	22.3 yd3

Tools and Equipment

Installation efficiency is greatly improved by the appropriate choice of construction equipment and tools. The following guidelines apply to most GEOWEB system applications. Non-standard tools and equipment may provide additional benefits in some situations.

Table 3 Standard Construction Tools for Installation of the GEOWEB® System

GEOWEB Components	Power Tools	Concrete Finishing	Surveying Equipment
ATRA Tendon & Stake Clips/Anchors	Heavy-duty drill	Bull floats	Surveyor's auto-level
ATRA Wall Key Connection Device	Circular saw	Hand floats	Tripod and rod
Hand Tools	Percussion hammer	Steel trowels	Laser beacons
Shovels and spades	Gas generator	Poker vibrators	Audio target receiver
Rakes and screed bars	Air compressor	Tamping rods	Survey stakes
Sledgehammers	Electric Impact Hammer		Markers + spray cans
Crowbars	ATRA Anchor Driving Tool and Gad		Stringlines + spirit level
Utility knives			
Spikes, nails + lumber			
Templates			

Excavation and Materials Handling Equipment

Conventional excavators, front-end loaders, mini-excavators, and skid-steer loaders, equipped with smooth-edged buckets, are normally employed for the installation of GEOWEB systems. Infilling of GEOWEB sections can also be carried out with conveyors, chutes, and skips. As a rule, the overall rate of installation relates directly to the speed and efficiency of infill placement and compaction.

Compaction Equipment

Compaction of GEOWEB section wall infill and backfill is normally carried out with walk-behind plate tampers and vibratory drum rollers. Large smooth-drum and sheepsfoot riding compactors can be utilized for backfill compaction of large structures. Do not over vibrate the panels to prevent panels lifting from the cell below. Monitor compaction to ensure the panels are not lifting. Panel lifting and outward lateral displacement of wall sections indicates that excessive compaction is occurring.

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Limited Warranty

Presto Geosystems warrants each GEOWEB section which it ships to be free from defects in materials and workmanship at the time of manufacture. Presto's exclusive liability under this warranty or otherwise will be to furnish without charge to Presto's customer at the original f.o.b. point a replacement for any section which proves to be defective under normal use and service during the 10-year period which begins on the date of shipment by Presto. Presto reserves the right to inspect any allegedly defective section in order to verify the defect and ascertain its cause.

This warranty does not cover defects attributable to causes or occurrences beyond Presto's control and unrelated to the manufacturing process, including, but not limited to, abuse, misuse, mishandling, neglect, improper storage, improper installation, improper alteration, or improper application.

Presto makes no other warranties, express or implied, written or oral, including, but not limited to, any warranties or merchantability or fitness for any particular purpose, in connection with the GEOWEB system. In no event shall Presto be liable for any special, indirect, incidental or consequential damages for the breach of any express or implied warranty or for any other reason, including negligence, in connection with the GEOWEB system.

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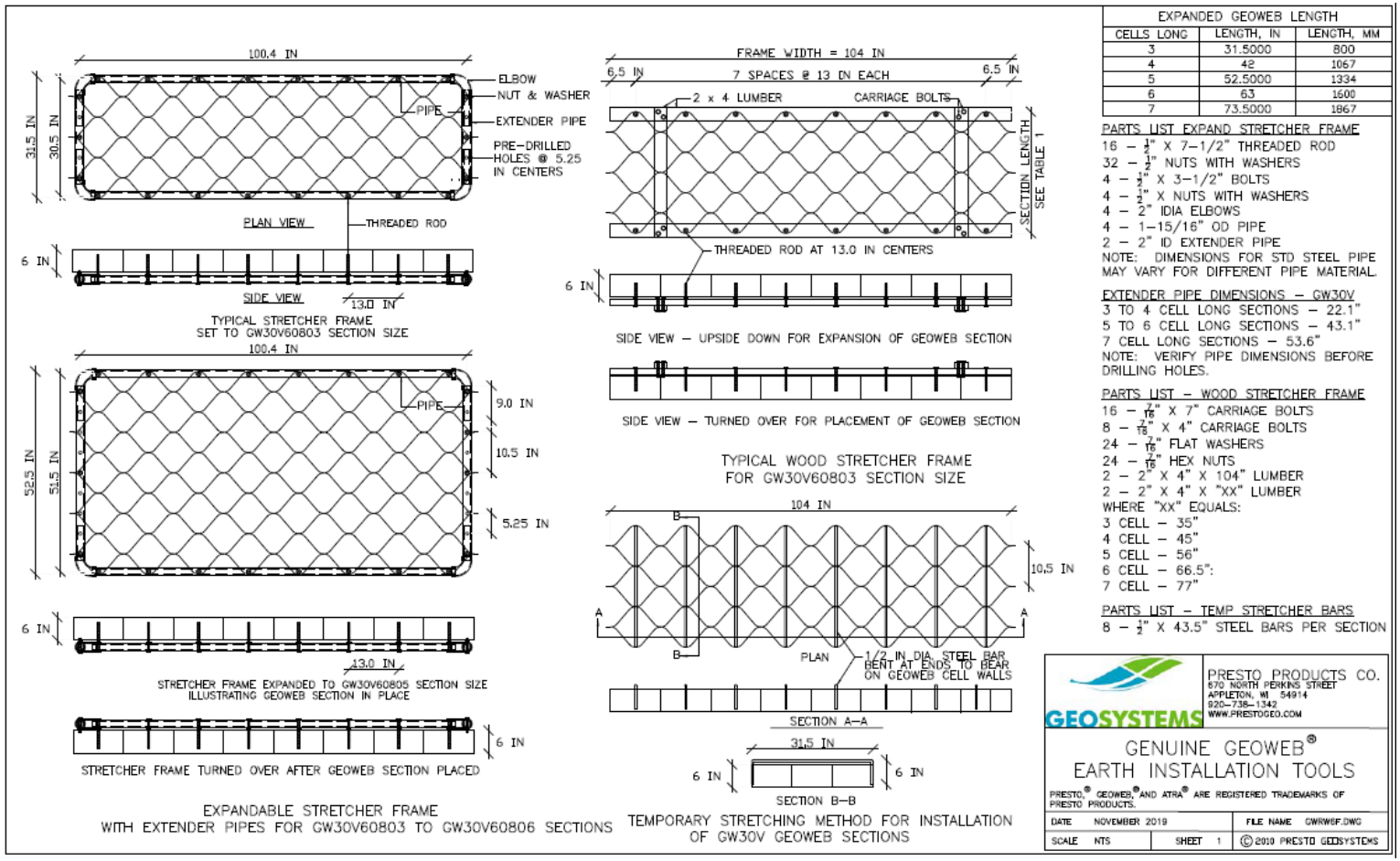
Stretcher Frame & Bar Details



EXPANDED GEOWEB LENGTH		
CELLS LONG	LENGTH, IN	LENGTH, MM
3	31.5000	800
4	42	1067
5	52.5000	1334
6	63	1600
7	73.5000	1867

PARTS LIST EXPAND STRETCHER FRAME
16 – 1/2" X 7–1/2" THREADED ROD
32 – 1/2" NUTS WITH WASHERS
4 – 1/2" X 3–1/2" BOLTS
4 – 1/2" X NUTS WITH WASHERS
4 – 2" IDIA ELBOWS
4 – 1–15/16" OD PIPE
2 – 2" ID EXTENDER PIPE
NOTE: DIMENSIONS FOR STD STEEL PIPE MAY VARY FOR DIFFERENT PIPE MATERIAL.

EXTENDER PIPE DIMENSIONS – GW30V
3 TO 4 CELL LONG SECTIONS – 22.1"
5 TO 6 CELL LONG SECTIONS – 43.1"
7 CELL LONG SECTIONS – 53.6"
NOTE: VERIFY PIPE DIMENSIONS BEFORE DRILLING HOLES.

PARTS LIST – WOOD STRETCHER FRAME
16 – 7/16" X 7" CARRIAGE BOLTS
8 – 7/16" X 4" CARRIAGE BOLTS
24 – 7/16" FLAT WASHERS
24 – 7/16" HEX NUTS
2 – 2" X 4" X 104" LUMBER
2 – 2" X 4" X "XX" LUMBER
WHERE "XX" EQUALS:
3 CELL – 35"
4 CELL – 45"
5 CELL – 56"
6 CELL – 66.5":
7 CELL – 77"

PARTS LIST – TEMP STRETCHER BARS
8 – 1/2" X 43.5" STEEL BARS PER SECTION

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GENUINE GEOWEB®
EARTH INSTALLATION TOOLS

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Figure 12 Stretcher Frame & Bar Details