



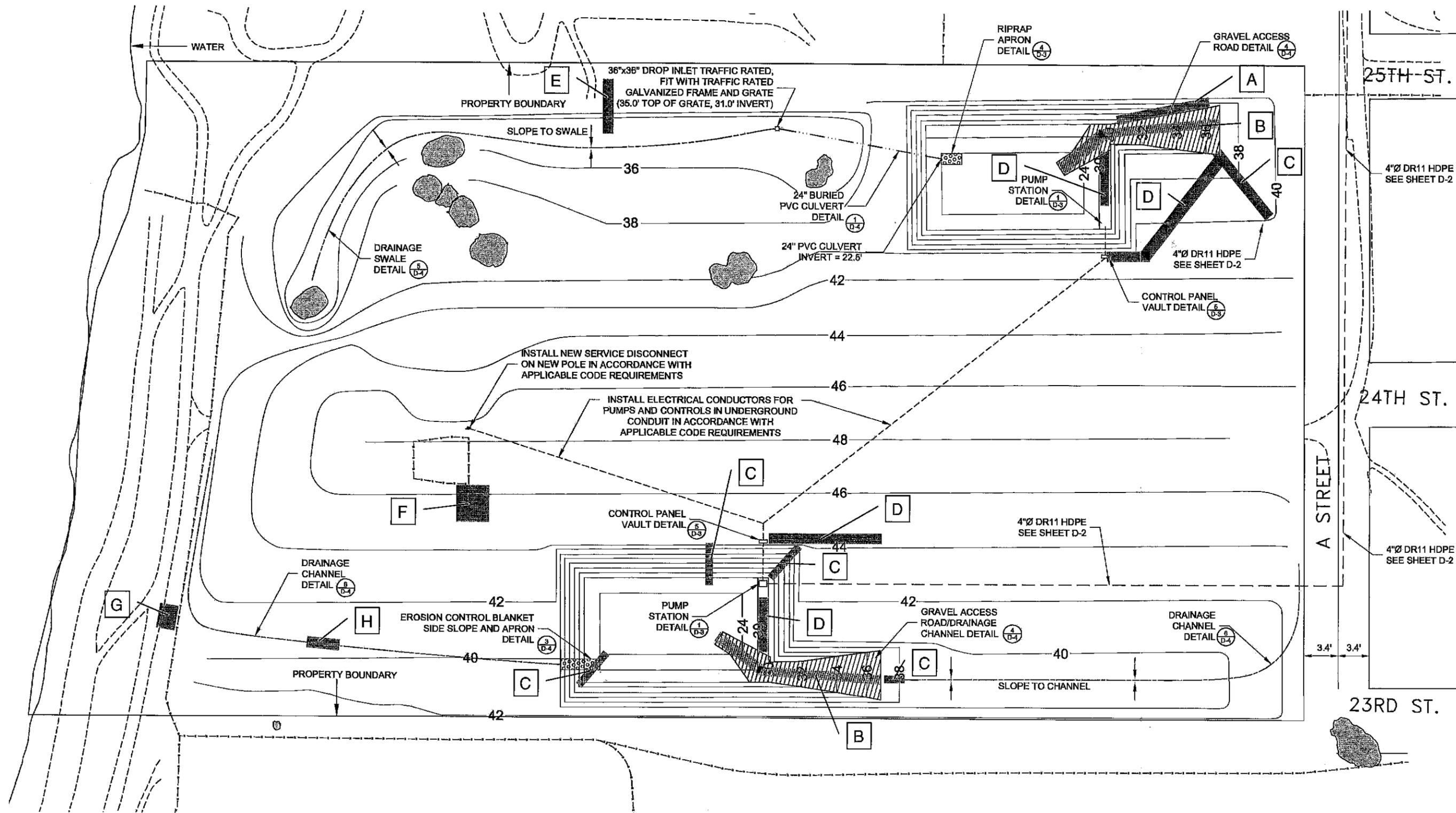
*Hand delivered
12/19/12
Sate Impartem*

Memo

To: Doug Veerkamp Construction
From: Tim Crandall, Kleinfelder
CC:
Date: 12-19-12
Re: Erosion Repairs
Dellar Trust Property, Sacramento

Heavy rains this fall have caused erosion damage that must be repaired as soon as possible. Plate 1 depicts areas in need of repair and identifies the type of repair with an alphabet character. The key for the repairs is shown below.

- A Anchor trench for erosion control mat (ECM) has failed. Dig a replacement anchor trench 1 foot further upslope, place a new section of ECM (same as existing) in anchor trench and overlap existing ECM by 2 feet. Stabilize with staples per manufacturers recommendations.
- B Concentrated flow has eroded aggregate base driving surface. Repair eroded areas and cover with Presto Geoweb GW30V60829P. Additional details will be provided describing repairs (manufacturer installation instructions are attached).
- C Rill erosion damaged area. Repair affected area and cover with ECM (Western Excelsior CC-4). Install per manufacturers recommendations.
- D Construct a twelve foot wide, 6 inch thick Caltrans Class 3 aggregate base road to the pump station/control panel vault.
- E Rill erosion on sideslope. Repair affected area and cover with ECM (Western Excelsior CC-4). Install per manufacturers recommendations.
- F Low area causes ponding. Fill with soil and reseed surface.
- G Low area. Coordinate repair with American River Flood Control District.



Note: See attached key for description of repairs

	PROJECT NO. 116081	EROSION REPAIR MAP	PLATE 1
	DRAWN: 12/19/12		
	DRAWN BY: TAC	DELLAR TRUST PROPERTY SACRAMENTO, CALIFORNIA	
	FILE NAME: Dellarerosioncontrolmap12-19-12r1.pub		



PRESTO GEOSYSTEMS

GEOWEB®

LOAD SUPPORT SYSTEM INSTALLATION GUIDELINE



PRESTO GEOSYSTEMS®

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GWLS000 18-APR-2011



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Subgrade Preparation

Geoweb® load support applications are generally classified as follows and illustrated in Figure 1 - Figure 5:

1. Unpaved access roads and hard-standing areas.
2. Base and subbase stabilization of flexible pavement structures.
3. Stabilized trackbed structures.
4. Raft construction on soft soils.
5. Structural spread footings.

The extent and nature of subgrade preparations depend on the type of structure and the subsoil conditions.

- Paved roads, railroad trackbeds and structural footings require accurate grading, shaping and proof-rolling of the subgrade soils.
- Provision of adequate cross-fall or crowning at formation level is particularly important.
- Raft construction, involving extremely weak compressible subsoils, generally limits subgrade preparation work to the clearing of large vegetation. Any existing root mass is normally left intact.

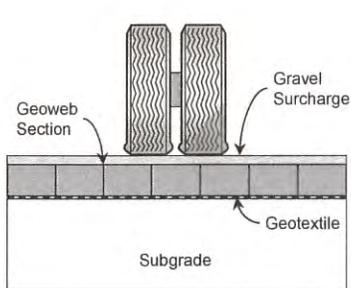


Figure 1 Unpaved Access

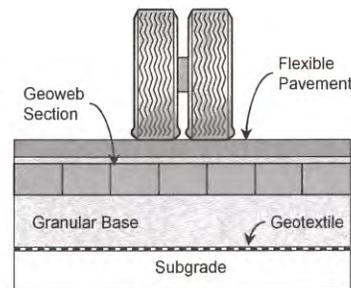


Figure 2 Flexible Pavement

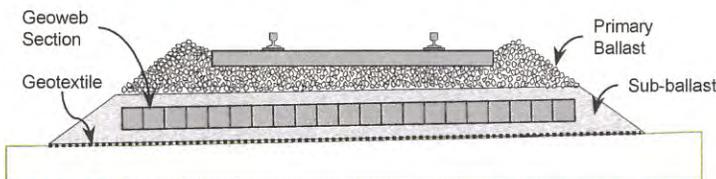


Figure 3 Trackbed Stabilization

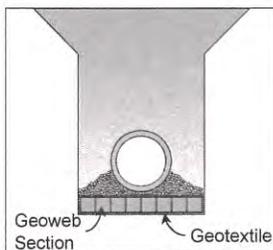


Figure 4 Pipeline Support

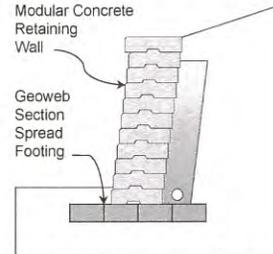


Figure 5 Spread Footing

Geotextile Underlayer

- Most load support applications involve a geotextile separator layer at the subgrade surface. When required, this separation layer is critical to the performance of the load support system.
- Ensure that minimum overlap between rolls is maintained. See Figure 6.
- The geotextile may also function as a lateral drainage medium. A thick, non-woven geotextile or geo-composite materials are then required.
- High-strength geotextiles are used when building Geoweb® structures over soft compressible soils. Pre-sewn seams, rather than overlapped joints, may be required in some situations.

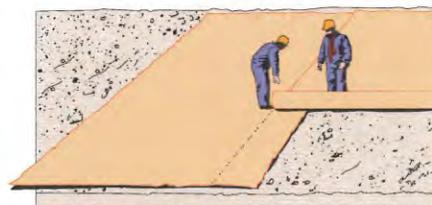


Figure 6 Geotextile Placement



Installation of Geoweb® Sections

- **Option 1:** Expand the specified Geoweb® section into position and anchor with stakes. See Figure 7. When ATRA® Anchors are used, ensure the ATRA® Clip arm is hooked over the cell wall or placed through the cell-wall slot hole. See Figure 8.
- Specialized driving tools are available through Presto Geosystems' authorized distributors and representatives to speed driving of ATRA anchors.
- **Option 2:** Expand and manually fill selected perimeter cells prior to machine infilling. See Figure 9.
- **Option 3:** The use of stretcher frames is generally recommended only for underwater or extremely cold applications.

Expand and fit the Geoweb® section over the dowels of a suitably dimensioned stretcher frame. Invert the frame and position the section to receive infill material. When the Geoweb® section is filled, remove the frame and repeat the process. See Figure 10.

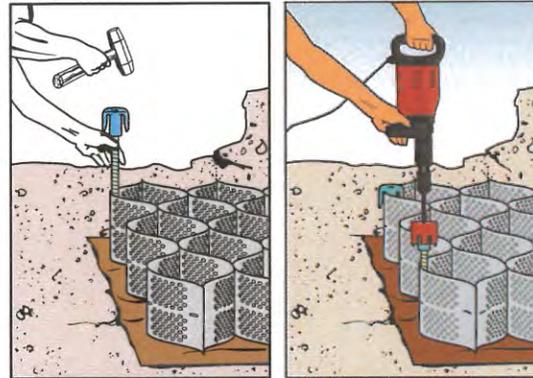


Figure 7 Stake Anchorage

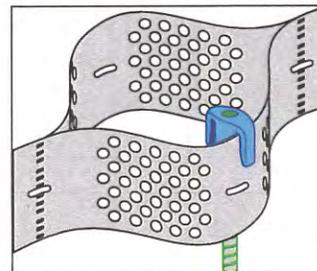


Figure 8 ATRA® Anchor Placement Options

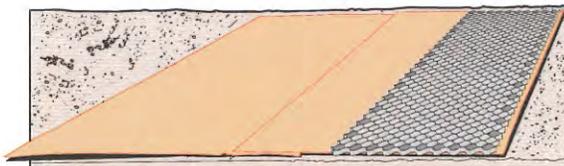


Figure 9 Infilling Perimeter Cells

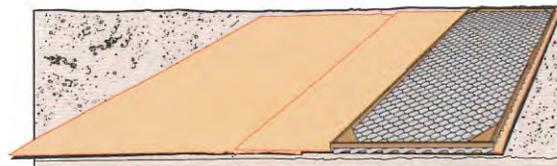


Figure 10 Use of Stretcher Frame

Installation of Geoweb® Sections on Curves

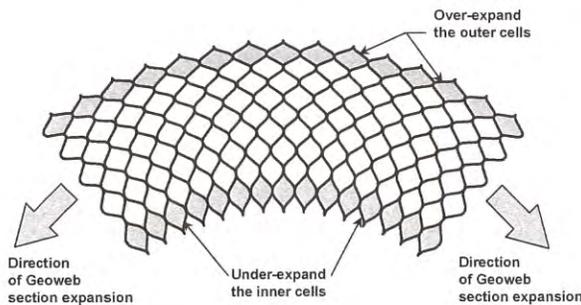


Figure 11 Curved Expansion of Section

Method 1: Geoweb® sections can be readily adapted to cover curved areas by varying the degree of cell expansion across the width of individual sections. See Figure 11.

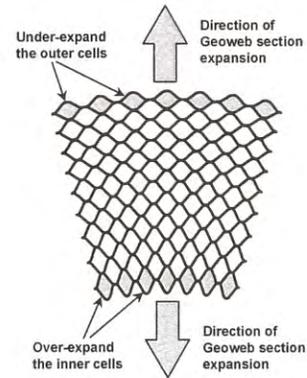


Figure 12 Tapered Expansion of Section

Method 2: Progressively vary the degree of cell expansion along the length of a section. See Figure 12.

Connecting Geoweb® Sections



Figure 13 ATRA® Key Connection Device

- Verify that the expanded dimensions of each Geoweb® section are correct.
- Interleaf sides and abut ends of adjoining sections, ensuring that the upper surfaces of adjoining sections are flush.
- Connect each of the interleaved and abutted cells with the ATRA® key connection device. Position the ATRA key through the slots of overlapping sections (side-to-side), or where cells connect (end-to-end), and turn key to "lock" in position. See Figure 13.
- When Geoweb sections are connected end-to-end, under-expand a few rows of the adjoining section to allow easy placement of the ATRA keys before fully expanding the connecting section. For easiest placement, insert the key completely through one cell before inserting through the adjoining cell. Adjoining sections should also be fully connected prior to infilling.
- The use of the ATRA key device will reduce construction time significantly and offers cost-savings compared to stapling operations.
- Geoweb sections may also be connected with pneumatic staplers either side-to-side or end-to-end.
- The ATRA key connection device and pneumatic staplers are available through Presto Geosystems and their authorized distributors/representatives.



Placement and Compaction of Geoweb® Infill

- Place fill into expanded cells with suitable material handling equipment such as a front-end loader or excavator. See Figure 14 and Figure 15.
- Limit drop-height of infill material to a maximum of 1 m (3 ft).
- Overfill Geoweb® sections at least 50 mm (2 in) above the cell walls before trafficking or compacting.
- Compact infill material to the specified density with conventional compaction equipment. See Figure 16. See Compaction Equipment on page 5 for limitations.



Figure 14 Fill Placement with Loader

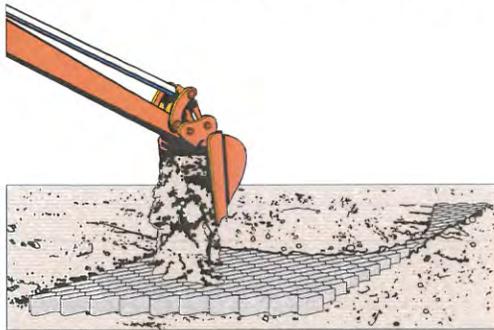


Figure 15 Fill Placement with Excavator



Figure 16 Infill Compaction

Upon completion of the installation, ensure that an aggregate surcharge of at least 10 mm (0.4 in) is maintained above the Geoweb® cell walls at all times.

Unbound aggregate surfacing must be graded and maintained on a regular basis.

NOTE: When pea gravel or other highly rounded stone is used for the infill and will have direct traffic over the surface, blend it with 40%-45% sand to prevent excessive movement of the material.

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.

Table 1 V-Series Geoweb® Shipping Dimensions and Weights

<i>Cell Depth</i>	<i>Pallet Dimensions</i>	<i>Minimum Weight</i>	<i>Maximum Weight</i>
100 mm (4 in)	1070 mm x 1070 mm (42 in x 42 in)	400 kg (880 lb)	730 kg (1,600 lb)
150 mm (6 in)	1070 mm x 1070 mm (42 in x 42 in)	360 kg (800 lb)	660 kg (1,450 lb)
200 mm (8 in)	1070 mm x 1070 mm (42 in x 42 in)	400 kg (880 lb)	730 kg (1,600 lb)

Infill Volumes

Table 2 Infill Volumes for Geoweb® Sections

Cell Depth	100 mm (4 in)	150 mm (6 in)	200 mm (8 in)
Volume (m ³ / 100 m ² of area)	10.0 m ³	15 m ³	20.0 m ³
Volume (yd ³ / 100 yd ² of area)	11.1 yd ³	16.7 yd ³	22.2 yd ³

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

<i>Geoweb® Components</i>	<i>Power Tools</i>	<i>Concrete Finishing</i>	<i>Surveying Equipment</i>
ATRA® Clips/Anchors	Heavy-duty drill	Bull floats	Surveyor's auto-level
ATRA® Connection Device	Circular saw	Hand floats	Tripod and rod
<i>Hand Tools</i>	Percussion hammer	Steel trowels	Laser beacons
Shovels and spades	Stanley-Bostitch stapler	Poker vibrators	Audio target receiver
Rakes and screed bars	SB103020 wire staples	Tamping rods	Survey stakes
Sledge hammers	Gas generator		Markers + spray cans
Crowbars	Air compressor		String-lines + 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

Fully compacted infill is critical to the performance of the load support systems. When building a load support system over a very soft subbase, a wave may occur in the system during the compaction process. If the wave continues while compacting, full compaction will not be obtained. To remedy this situation, the use of lighter compaction equipment is mandatory.



PRESTO GEOSYSTEMS

**GEOWEB®
LOAD SUPPORT SYSTEM
INSTALLATION GUIDELINE**

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.

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